Updating The Hoover Dam Documents

1978

United States Department of the Interior

Bureau of Reclamation

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Milton N. Nathanson

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UNITED STATES GOVERNMENT PRINTING OFFICE
DENVER: 1980

For sale by the Superintendent of Documents, U.S. Government Printing Office,
Washington, D.C. 20402, and the Bureau of Reclamation,
Engineering and Research Center, Denver Federal Center,
P.O. Box 25007
Denver, Colorado 80225, Attention: 922.

Preface

TO "UPDATING THE HOOVER DAM DOCUMENTS"

The first edition of the "Hoover Dam Contracts" was published in February 1933. It was revised as "The Hoover Dam Documents" in November 1948 by Ray Lyman Wilbur and Northcutt Ely.

This volume, entitled "Updating the Hoover Dam Documents, 1978" recounts the major events since 1948 which, together with the matters described in the 1933 and 1948 editions, constitute what is referred to as "The Law of the River." Its preparation was proposed to the Department of the Interior by the Lower Basin States and adopted by the Department.

The background of the documents included herein is described in Part I. The texts of the documents are included in the Appendix in Part II.

Milton N. Nathanson

March 1978

Introduction

This volume contains the major documents which date from 1948, pertaining to the Colorado River. However, because of their importance, the chapters on "United States Colorado River Water Delivery and Related Contracts" and "Power Contracts" enumerate all the current contracts in those categories including those pre-1948 and subsequent thereto.

Coupled with the events which occurred prior to 1948, these documents constitute "The Law of the River" and are summarized in Chapter I.

Following explanatory narrative chapters which describe their background and origin, the texts of the major documents appear as Appendices. The explanatory narrative statements have been divided into Chapters; and the Appendices have been identified by numbers which correspond to the Chapter numbers.

This volume includes the following chapters:

Chapter I - Summary of "The Law of the River"

Chapter I is a narrative statement of "The Law of the River" and provides an overall view of all major developments affecting the "Law of the Colorado River." To make this volume as self-sufficient as possible it includes a summary of the events covered in the 1933 edition of "The Hoover Dam Contracts—Wilbur and Ely" and the 1948 edition of "The Hoover Dam Documents—Wilbur and Ely."

Chapter II - United States Colorado River Water Delivery and Related Contracts

Chapter II recites each Colorado River water delivery contract entered into by the United States and related contracts, separately covered by reference to the Lower Basin States where the water is used and by the Project which identifies the contractor. Because of the volume of such contracts no texts have been included as Appendices. The texts of many of the earlier contracts appear in "The Hoover Dam Documents—Wilbur and Ely, 1948."

Chapter III - Power Contracts

Chapter III recites each power contract entered into by the United States in the Lower Basin States involving Bureau of Reclamation facilities. Subchapters are provided which cover the Boulder Canyon Project contracts, the Parker-Davis Project contracts, the Navajo Generating Station contracts, the Colorado River Storage Project contracts, and the Pacific Northwest-Pacific Southwest Intertie contracts. Because of the volume of such contracts no texts have been included as Appendices. The texts of the earlier contracts appear in "The Hoover Dam Documents—Wilbur and Ely, 1948."

Chapter IV - The Upper Colorado River Basin Compact

Chapter IV refers to the Upper Colorado River Basin Compact which apportions to the Upper Basin States the waters available to the Upper Basin under the Colorado River Compact of 1922. Its text appears in Appendix 1 G.1.

Chapter V - The Colorado River Storage Project Act

Chapter V refers to the Colorado River Storage Project Act, its major components and power contracts. Its text appears in Appendix 1 H.1.

Chapter VI - General Principles to Govern, and Operating Criteria For, Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period

Chapter VI recites the genesis of the "Filling Criteria" promulgated to control the impact on downstream water users and power customers of water storage in Lake Powell and other Upper Basin storage projects. The text appears in Appendix 602.

Chapter VII - Operating Criteria

Chapter VII describes the background of the long-range operating criteria for reservoirs on the Colorado River system. The text appears in Appendix 701.

Chapter VIII - Arizona v. California

A summary of the dispute which culminated in the litigation and a summary of the Special Master's Report is provided in Chapter VIII. This includes a discussion of the prior litigation, the principal issues, the various arguments, the Master's principal conclusions, Winter's Rights Doctrine for Indian and Federal reservations, mainstream allocations, and present perfected rights. Because of its length (361 pages plus 72 pages of appendices), the text is not included in the Appendices.

Chapter IX - Supreme Court Opinion - Arizona v. California of June 3, 1963, 373 U.S. 546; and Decree of March 9, 1964, 376 U.S. 340

Chapter IX contains a summary of the Supreme Court Opinion in *Arizona* v. *California*, the reasoning of the Court in considering the various contrary arguments, where it agreed with the Special Master, and where the Court disagreed with and reversed the Special Master. The Decree is discussed in Part J of Chapter I hereof. The texts of the Opinion and of the Decree are included in Appendices 901 and 902, respectively.

Chapter X - Present Perfected Rights

Chapter X provides a narrative statement of the background of present perfected rights, the lengthy negotiations leading to a proposed stipulated determination, the objections thereto of the Indian Tribes along the river in the Lower Basin, the proposed compromise stipulation, and the Supreme Court Opinion of January 9, 1979, approving the proposed Decree. The texts of the Decree and the Supreme Court Opinion of January 9, 1979, are included in Appendix 1005.

Chapter XI - Enlargement of Boundaries of Indian Reservations Along Lower Colorado River and Alleged "Omission" of Irrigable Acreage

Chapter XI contains a summary narrative statement of the Departmental and other actions leading to resolution of the boundary disputes and the "enlargement" of the boundaries of the Reservations along the lower Colorado River. Texts of the Departmental Opinions are included in the Appendices.

Chapter XII - Colorado River Basin Project Act, September 30, 1968

Chapter XII provides the background of the Colorado River Basin Project Act, the various proposed authorization bills, the controversies concerning Bridge Canyon and Marble Canyon Dams, the Pacific Southwest Water Plan, the Northwest States objections to export of water, Arizona's go-it-alone plan, and a final compromise. The text of the Act is included in Appendix 1202.

Chapter XIII - The Mexican Salinity Problem

Chapter XIII sets out the problems with Mexico arising from the salinity of the waters delivered to it under the Mexican Water Treaty; the efforts to solve the problems; and Minutes Nos. 218, 241 and 242. Texts of these items appear in the Appendices as 1 F.1, 1301, 1302, and 1303, respectively.

Chapter XIV - Colorado River Basin Salinity Control Act

Chapter XIV discusses the Administration bill to deal only with the Mexican salinity problem and the bill endorsed by the Basin States to include salinity control projects upstream from Imperial Dam as well as the Mexican salinity problem. The text of the Colorado River Basin Salinity Control Act appears in Appendix 1403.

Acknowledgment

The texts of the documents printed in the Appendices were made available by the Water and Power Resources Service. On November 6, 1979, the name of the Bureau of Reclamation was changed to the Water and Power Resources Service. In this document the previous title has been retained. The author expresses his appreciation to the Bureau of Reclamation, former Commissioner Gilbert Stamm, Commissioner R. Keith Higginson, Regional Director Manuel Lopez, Assistant Regional Director Roy D. Gear, and the members of their staffs for these and other courtesies.

Milton N. Nathanson

Contents

Page

CHAPTER I - SUMMARY OF "THE LAW OF THE RIVER"

A. "The Law of the River" 1

A.1 Physical Characteristics of the Colorado River 1
A.2 Water Supply 2
A.3 Early River Development 2

B. Colorado River Compact 3

B.1 Background 3
B.2 Negotiations 3
B.3 Major Compact Provisions 3
B.4 Compact Approval 4
B.5 California Limitation Act 5

C. Boulder Canyon Project Act (45. Stat. 1057) 5

C.1 Major Impact 5
C.2 Division of Lower Basin Water 5
C.3 Conditions Precedent to Act 6
C.4 Other Major Provisions 6
C.5 Power Contracts 6
C.5.1 Implementation of Power Contract Authority 7
C.6 Boulder Canyon Project Adjustment Act 7
C.7 Water Delivery Contracts - General 8
C.7.1 Implementation of Water Delivery Contract Authority 8

D. California Seven Party Agreement 8

E. Water Delivery Contracts for Colorado River Water in the Lower Colorado River Basin 9

F. The Mexican Water Treaty 10

G. The Upper Colorado River Basin Compact 11

H. The Colorado River Storage Project Act 11

I. *Arizona* v. *California* 12

J. The Supreme Court Decree in *Arizona* v. *California* 14

Page

K. Present Perfected Rights 15

K.1 Background 15
K.2 Negotiation 16
K.3 Back to the Supreme Court 17
K.4 Indian Intervention Motions 17
K.5 United States Position on Indian Intervention 17
K.6 States and Other Defendants Positions on Indian Interventions 18
K.7 Supreme Court Hearing and Supplemental Decree 19
K.8 New Phase of Decreed Rights 19

L. Filling Criteria 20

M. The Colorado River Basin Project Act - Public Law 90-537 22

N. Operating Criteria 24

O. Mexican Salinity Problems 26

O.1 Minute No. 218 26
O.2 Minute No. 241 27
O.3 Minute No. 242 27

P. The Colorado River Basin Salinity Control Act 27

P.1 Operations Pursuant to Minute No. 242 During 1977 28

CHAPTER II - UNITED STATES COLORADO RIVER WATER DELIVERY AND RELATED CONTRACTS

A. Background 29

B. California Water Delivery Contracts 29

B.1 Seven-Party Priority Agreement 29
B.2 The Metropolitan Water District of Southern California 30
B.3 City of San Diego 31
B.4 Imperial Irrigation District 31
B.5 Palo Verde Irrigation District 32
B.6 Coachella Valley Water District 32
B.7 Reservation Division, Yuma Project, California 33
B.8 Special Water Delivery Contracts Involving The Metropolitan Water District 33

Page

B.8.1 Water Exchange Agreements with Coachella Valley Water District and Desert Water Agency . . . 33
B.8.2 Southern California Edison Company - San Diego Gas and Electric Company . . . 34
B.9 Article V Reports under Decree in *Arizona* v. *California* and Return Flow Credits . . . 35
B.10 California Water Use . . . 35
B.11 California Miscellaneous Contracts . . . 36

C. Arizona Water Delivery Contracts . . . 36

C.1 Yuma Project - Valley Division . . . 36
C.1.1 Valley Division's Water Use . . . 37
C.2 Gila Project - Reauthorization Act . . . 37
C.2.1 Gila Gravity Main Canal Capacity . . . 38
C.3 Wellton-Mohawk Division . . . 38
C.3.1 Wellton-Mohawk's Water Use . . . 40
C.3.2 Drainage Contracts . . . 40
C.3.3 Miscellaneous Wellton-Mohawk Contracts . . . 40
C.4 Yuma Mesa Division - Gila Project - Yuma Mesa Irrigation and Drainage District . . . 41
C.4.1 Yuma Mesa Irrigation and Drainage District Water Use . . . 41
C.4.2 North Gila Valley . . . 42
C.4.2.1 North Gila Valley Water Use . . . 42
C.4.3 Yuma Irrigation District - South Gila Valley . . . 43
C.4.3.1 Yuma Irrigation District Water Use . . . 44
C.5 Yuma Auxiliary Project (Unit B) . . . 44
C.5.1 Yuma Auxiliary Project (Unit B) Water Use . . . 45
C.6 Other Arizona Water Delivery Contracts . . . 45
C.7 Miscellaneous Water and Related Contracts . . . 46
C.7.1 Arizona's Colorado River Water Use . . . 46
C.8 Central Arizona Project . . . 47

D. Nevada Water Delivery Contracts . . . 49

D.1 Boulder City . . . 49
D.2 Basic Management, Inc. . . . 49
D.3 Las Vegas Valley Water District . . . 50
D.4 Colorado River Commission of Nevada - Southern California Edison Company . . . 50
D.5 Southern Nevada Water Project . . . 50
D.5.1 First Stage . . . 50
D.5.2 Second Stage . . . 51
D.5.3 Second Stage Subcontracts . . . 51
D.6 Miscellaneous Nevada Water Delivery Contracts . . . 52
D.7 Nevada Water Use . . . 52
D.8 Nevada's Use of Excess or Surplus Water . . . 52

Page

CHAPTER III - POWER CONTRACTS

A. Background 55

A.1 Priorities in the Use of Hoover Dam 55
A.2 Sources of Federal Power and Energy 55
A.3 Department of Energy 55
A.4 Contracts Administered by DOE, Interior, and Jointly 56

B. Boulder Canyon Project 56

B.1 Background 56
B.2 Current Contracts 57
B.3 Operating Year Ending May 31, 1976 57
B.4 Hoover Powerplant Modification 60

C. Parker-Davis Project 60

C.1 Background 60
C.2 Contracts for the Sale of Power 61
C.3 Reallocations 64
C.4 Other Parker-Davis Revenues 67
C.5 Reclamation's Project Use Loads 67
C.6 Rate Adjustments 69
C.6.1 Fiscal Year 1976 Repayment Study 69
C.7 Summary of Energy Deliveries and Income-Fiscal Years 1976, 1977 70

D. Colorado River Storage Project 74

D.1 Background 74
D.2 Storage Projects 75
D.3 Powerplants and Reservoir Capacity 76
D.4 Participating Projects 77
D.5 CRSP Power Rates 77
D.6 Reallocation of CRSP Power 78
D.7 CRSP Withdrawal Suits 78
D.8 Summary of Energy Deliveries and Income-Fiscal Years 1976, 1977 79

E. Navajo Project 82

E.1 Background 82
E.2 Physical Features 83
E.3 Participants 84
E.4 Navajo Project Documents and Contracts 84
E.5 Litigation 87

Page

E.6 Committees 87
E.7 Department of Energy 88
E.8 Navajo Project Precipitators 88
E.9 Review of Negotiation and Circumstances Leading up to the Execution of the Contracts for Interim Sale of United States Entitlement of Navajo Project 88
E.10 Summary of Energy Deliveries and Income - Fiscal Year 1977 90

F. Pacific Northwest-Pacific Southwest DC Intertie 91

F.1 Background 91
F.2 Task Forces 92
F.2.1 System Studies Task Force 93
F.2.2 Economic Evaluation Task Force 93
F.2.3 Environmental Task Force 93
F.3 Intertie Contracts 94

CHAPTER IV - THE UPPER COLORADO RIVER BASIN COMPACT

CHAPTER V - THE COLORADO RIVER STORAGE PROJECT ACT

CHAPTER VI - GENERAL PRINCIPLES TO GOVERN, AND OPERATING CRITERIA FOR, GLEN CANYON RESERVOIR (LAKE POWELL) AND LAKE MEAD DURING THE LAKE POWELL FILLING PERIOD

A. Background 101

B. Participation by States 101

C. Bureau of Reclamation's Initial Proposal 102

D. Revised Principles 103

E. Secretarial Approval of General Principles and Operating Criteria 106

F. Additional Regulation No. 1 106

G. Promulgation of Principles and Additional Regulation No. 1 107

H. Closure of Glen Canyon Dam 107

I. Modification of Filling Criteria - May 11, 1964 107

J. Storage - Lake Powell and Lake Mead 110

Page

K. Extent of Deficiencies and Impairment Energy Furnished 110

L. Efforts to Change or Terminate Filling Criteria 111

CHAPTER VII - OPERATING CRITERIA

A. Background 113

B. Colorado River Basin Project Act - Section 602(a) 114

C. Formulation of Operating Criteria 115

D. State-Federal Meetings 116

D.1 Upper Basin Views 116
D.2 Lower Basin Views 117

E. California Draft 117

F. Arizona Draft 118

G. Nevada's Views 118

H. Upper Basin Comments 118

I. Other Comments 119

I.1 Final Task Force Meeting 119

J. Secretary's Proposed Criteria 119

K. Governor's Comments 120

L. Adoption of Operating Criteria 120

M. Provisions of the Criteria 121

N. Operations Under Operating Criteria 123

O. Ancillary Problems 124

CHAPTER VIII - *ARIZONA* V. *CALIFORNIA*

A. Background of Litigation 127

B. Suit by Arizona 127

Page

B.1 Upper Basin Joinder 128
B.2 Special Master Appointed 128

C. Special Master's Report - December 5, 1960 128

C.1 Issues 128
C.1.1 Application of Project Act 128
C.1.2 Tributary Water 129
C.1.3 Claims of United States 129
C.2 Prior Colorado River Litigation 129
C.2.1 Colorado River Basin Background 130
C.3 Mainstream Supply 130
C.4 Jurisdiction and Justifiability 131
C.5 Inapplicability of Colorado River Compact 131
C.6 Boulder Canyon Project Act Controls 132
C.7 Interpretation of "Waters Apportioned by Article III(a) of the Compact" 133
C.8 California's Limitation Measured at Points of Diversion 134
C.9 Interpretation of "Excess" or "Surplus" Waters 134
C.10 Beneficial Consumptive Use 134
C.11 Water Delivery Contracts Made by the Secretary of the Interior 134
C.12 Allocation of Shortages 135
C.13 Deductions for Uses Above Lake Mead Invalid 135
C.14 United States Uses Charged to States 136
C.15 United States Claims to Mainstream Waters 136
C.15.1 Indian Reservations - Winter's Rights 136
C.15.2 Findings of Fact and Conclusions of Law 137
C.15.3 National Forests, Recreation Areas, Parks, Memorials, Monuments and Lands Administered by the Bureau of Land Management 137
C.15.4 Mexican Water Treaty 138
C.15.5 Protection of Wildlife 138
C.15.6 Boulder City, Nevada 138
C.16 Mainstream Allocation 138
C.17 Present Perfected Rights 139
C.18 Requirement for a Contract 140
C.19 Measurement of Consumptive Use 140
C.20 Rejection of Permanent Commission 141
C.21 Claims to Waters in Tributaries 141
C.22 Gila River System 141
C.22.1 New Mexico's Claims 141
C.22.2 United States Claims 142

D. Special Master's Decree Recommended to Supreme Court 142

Page

CHAPTER IX - SUPREME COURT OPINION - *ARIZONA* V. *CALIFORNIA* OF JUNE 3, 1963, 373 U.S. 546; AND DECREE OF MARCH 9, 1964, 376 U.S. 340

A. Issues 143

B. Boulder Canyon Project Act Controlled Apportionment 144

C. Compact, Prior Appropriation and Equitable Apportionment Inapplicable 144

D. States Control Use of Tributaries 144

E. Congress Provided for Apportionment of Water 145

E.1 Prior Appropriation Inapplicable 145
E.2 State Water Law Inapplicable 145

F. Secretary Can Charge States for Diversions Above Lake Mead 146

G. Secretarial Control of Mainstream Below Lee Ferry 146

H. Secretary's Sole Right to Contract for Water 146

I. Apportionment in Time of Shortage 147

J. Arizona-New Mexico Gila Controversy 147

K. Claims of the United States 147

K.1 Indian Reservations - Winter's Doctrine 147
K.2 Inappropriate to Determine Boundary Disputes 147
K.3 Other Federal Establishments 148
K.4 Uses by United States 148

L. Dissents to Opinion 148

M. Supreme Court Opinion of June 3, 1963, and Decree of March 9, 1964 149

CHAPTER X - PRESENT PERFECTED RIGHTS

A. Background 151

B. Determination Required by Decree, Article VI 151

C. Importance of Present Perfected Rights 152

D. Effect of Section 301(b) of Basin Project Act 152

Page

E. Present Perfected Rights Include Federal Establishments 152

F. Events Leading to Draft Stipulation of Present Perfected Rights 152

F.1 Meetings with States 153
F.2 United States Preparation of Data 153
F.2.1 Yuma Auxiliary Project (Unit B), Arizona 154
F.2.2 Reservation Division - Bard Unit and Valley Division - Yuma Project 154
F.3 Records of Imperial and Palo Verde Irrigation Districts 155
F.4 Discussions with States 155
F.4.1 States Request for Extension of Time for Compliance with Decree 156
F.5 United States List of PPRs Claims 156
F.5.1 California's List of PPRs Claims 156
F.6 Format of PPRs Statement 156
F.6.1 California's Draft of Priorities 157
F.6.2 Efforts to Agree to PPR Statement 157

G. Claims of Present Perfected Rights Filed With Supreme Court 158

G.1 United States Analysis of States Claims 159
G.2 Meeting of October 31, 1967 161
G.3 Supreme Court Action Postponed 162
G.4 Exchange of Parties Objections to PPR Claims of Other Parties and Their Restatement of all Claims 162

H. Formation of a Fact Finding Committee 163

H.1 Questions Posed by Fact Finding Committee Members 163

I. Preparation of "Compromise PPR Statement" 164

J. Miscellaneous Claims 167

K. Draft Stipulation on PPRs 169

L. Interior's Submittal of Draft Stipulation to Justice 171

L.1 Justice's Revision of Interior's Draft Stipulation 172
L.2 California's Modification of Justice's Revisions 172
L.3 Delay in Consideration of Draft Stipulation 173
L.4 Indian Objections to Draft Stipulation 173
L.5 Nathanson's Analysis of Foregoing 175
L.6 Solicitor's Review of Background of Stipulation 175

Page

M. States Revised Proposed Stipulation 175

N. Upper Colorado River Commission's Observation 176

O. Back to the Supreme Court 176

P. Indian Tribes' Intervention Motions and Opposing Responses 177

Q. Intervention Sought by the Two Tribes 179

R. Responses in Opposition 179

S. Joint Motion to Enter Agreed Upon Decree 180

T. Supreme Court Opinion and Decree of January 9, 1979 180

U. New Phase of Decreed Rights 181

CHAPTER XI - ENLARGEMENT OF BOUNDARIES OF INDIAN RESERVATIONS ALONG LOWER COLORADO RIVER AND ALLEGED "OMISSION" OF IRRIGABLE ACREAGE

A. Background 183

B. Effect of Boundary Changes on Water Use and Rights 183

C. Issues of "Omitted" Irrigable Lands in Litigation in *Arizona* v. *California* 183

D. Summary of United States Claims 186

E. Chemehuevi Indian Reservation 186

E.1 Background 186
E.2 Act Granting Reservation Lands to United States 186
E.3 Special Use Permit 187
E.4 Departmental Actions 187
E.5 Litigation 187
E.6 Special Master's Findings 188

F. Cocopah Indian Reservation 188

F.1 Background 188
F.2 Boundary Questions 188
F.3 Act Enlarging Reservation 189
F.4 Litigation 189
F.5 Departmental Actions 189
F.6 Act Enlarging Boundaries 190
F.7 Special Master's Findings 190

Page

G. Colorado River Indian Reservation 190

G.1 Background 190
G.2 Western Boundary Question 190
G.2.1 Benson Line 191
G.2.2 Man-Made Avulsive Changes 191
G.3 Departmental Actions 191
G.4 Litigation 192
G.5 Special Master's Findings 192

H. Fort Mohave Indian Reservation 193

H.1 Background 193
H.2 Question of Western Boundary 193
H.3 Special Master's Report 193
H.4 Departmental Actions 194

I. Conclusion 194

CHAPTER XII - COLORADO RIVER BASIN PROJECT ACT, SEPTEMBER 30, 1968

A. Background 195

B. S.1658 - 88th Congress to Authorize CAP 195

C. Permits for Bridge Canyon and Marble Canyon Dams 195

D. Objections to S.1658 196

E. Pacific Southwest Water Plan (PSWP) 196

F. S.2760 - 88th Congress 197

G. Was California's Priority an Effort to Overrule *Arizona v. California*? 198

H. Amendment of S.1658 198

H.1 S.3104 199
H.2 S.294 and S.75 199
H.3 S.1019 and H.R.4671 199
H.4 Comparison of Prior Legislative Proposals 200
H.5 Administration's Views 200
H.6 Basin States Consensus 201
H.6.1 House Subcommittee Hearings 201
H.6.2 Upper Basin Views 202
H.6.3 Northwest States Views 203

Page

H.6.4 Conservation Groups Views ... 203
H.6.5 Compromise Attempts ... 204
H.6.6 Subcommittee Approval of H.R.4671 ... 205
H.6.7 Criteria for Long Range Operation of Reservoirs ... 207
H.6.8 Amendment of H.R.4671 ... 208
H.7 Arizona's Go-It-Alone Plan ... 209
H.8 90th Congress - 1967 ... 209
H.8.1 Interior's More Limited Plan ... 209
H.8.2 S.1004 ... 210
H.8.3 Senate Approval of S.1004 ... 211
H.8.4 House Delay on CAP Legislation - Power Politics ... 211
H.8.5 H.R.3300 - S.1004 ... 212
H.8.6 House Approval of H.R.3300 and S.1004 ... 212
H.8.7 Senate-House Conference ... 213
H.9 Approval by Congress of Public Law 90-537 ... 213
H.9.1 Details of Public Law 90-537 ... 214
H.9.2 Reports Provided for by Public Law 90-537 ... 214
H.10 Execution of CAP Repayment Contract ... 216
H.11 How the Various Interests Benefited From CAP Legislation ... 216

CHAPTER XIII - THE MEXICAN SALINITY PROBLEM

A. Background ... 217

B. Mexico's Objections to Salinity ... 217

C. Minute No. 218 ... 218

D. Minute No. 241 ... 218

E. Permanent and Definitive Solution to International Salinity Problem ... 219

F. Minute No. 242 ... 220

G. United States Actions Under Minute No. 242 ... 220

G.1 Yuma Desalter ... 220
G.2 Coachella Canal Lining ... 221

H. Benefits to United States ... 221

I. Position of Basin States ... 221

I.1 Well Field ... 221
I.2 Energy ... 222

Page

I.3 Water Quality 222

J. Some Alternative Solutions to Salinity Program 222

CHAPTER XIV - COLORADO RIVER BASIN SALINITY CONTROL ACT

A. Background 223

B. Administration Bill 223

C. House Committee's Bill 224

C.1 Title II - Measures Upstream from Imperial Dam 225
C.2 Basin States Position 226
C.3 Need for Senate Ratification of Minute No. 242 226

D. Amendments to H.R.12165 227

E. Senate Bills 228

F. Status of Program 228

G. Operations Under Minutes Nos. 218, 241 and 242 229

APPENDICES

Page

APPENDIX I - THE LAW OF THE RIVER

1 A.2 - Bar Chart of Water Supply ..... I- 3
1 B.4 - 1922 Compact ..... I- 4
1 B.5 - The California Limitation Act, approved March 4, 1929 ..... I-12
1 B.6 - The Boulder Canyon Project Act, December 21, 1928 ..... I-13
1 C.6 - The Boulder Canyon Project Adjustment Act, July 19, 1940 ..... I-21
1 D.1 - The California Seven-Party Agreement, August 18, 1931 ..... I-27
1 F.1 - The Mexican Water Treaty, February 3, 1944 ..... I-30
1 G.1 - The Upper Colorado River Basin Compact, October 11, 1948 ..... I-88
1 H.1 - The Colorado River Storage Project Act, April 11, 1956 ..... I-99

APPENDIX II - COLORADO RIVER WATER DELIVERY CONTRACTS

The texts of the major water delivery contracts between the United States and the States of Arizona and Nevada and between the United States and the major water using entities in California entered into pre-1948 appear in "The Hoover Dam Documents - Wilbur and Ely, 1948."

Appendix 201 - Calendar Year 1977. Compilation of Records in Accordance with Article V of the Decree of the Supreme Court of the United States in *Arizona* v. *California* dated March 9, 1964. ..... II- 3

202 - Gila Reauthorization Act. II-41

APPENDIX III - POWER CONTRACTS

The texts of the Hoover Dam "underwriting" contracts of 1930, the power contracts of 1931, the agency contract of 1941, the energy contracts of May 29, 1941, and November 23, 1945, appear in "The Hoover Dam Documents - Wilbur and Ely, 1948."

Appendix 301 - Lists of Power Contracts as of October 1, 1977, administered by DOE, BUR/REC, and jointly. III-3

APPENDIX IV - UPPER COLORADO RIVER BASIN COMPACT

1 G.1 - Text of Compact (See Appendix I) IV-1

APPENDIX V - COLORADO RIVER STORAGE PROJECT ACT

1 H.1 - Text of Act (See Appendix I) V-1

APPENDIX VI - FILLING CRITERIA

601 - Senate Document No. 7, 88th Congress, 1st Session, March 14, 1963 ..... VI- 3
602 - General Principles and Operating Criteria, approved April 2, 1962 ..... VI-96
603 - Additional Regulation No. 1, approved July 12, 1962 ..... VI-97

Page

APPENDIX VII - OPERATING CRITERIA

701 - Secretary's Operating Criteria - June 8, 1970 ..... VII-3
702 - Commissioner of Reclamation's explanation - June 9, 1970 ..... VII-8

APPENDIX VIII - ARIZONA v. CALIFORNIA

801 - Special Master's Analysis of Compact VIII-3
802 - Special Master's Decree Recommended to Supreme Court VIII-8

APPENDIX IX - SUPREME COURT OPINION (June 3, 1963, 373 U.S. 546) and DECREE (March 9, 1964, 376 U.S. 340) in ARIZONA v. CALIFORNIA

901 - Supreme Court Opinion ..... IX- 3
902 - Supreme Court Decree IX-27

APPENDIX X - PRESENT PERFECTED RIGHTS

1001 - United States "List of Present Perfected Right Claims" filed March 9, 1967, with Supreme Court ..... X- 3
1002 - California's "List of Present Perfected Right Claims" filed March 9, 1967, with Supreme Court ..... X- 6
1003 - Arizona's "List of Present Perfected Right Claims" X-19
1004 - United States Proposed Stipulation submitted by Interior to Justice, April 12, 1973 ..... X-47
1005 - Supreme Court Opinion and Supplemental Decree of January 9, 1979 ..... X-66

APPENDIX XI - "ENLARGEMENT OF RESERVATIONS" AND "OMISSION" OF IRRIGABLE ACREAGE

Chemehuevi Indian Reservation

1101 - Secretary of the Interior's Withdrawal Order, February 2, 1907 ..... XI- 3
1102 - Act of July 8, 1940, 54 Stat. 733 ..... XI- 6
1103 - Act of October 28, 1942, 56 Stat. 1011 ..... XI- 7
1104 - Secretarial Determination, August 15, 1974 ..... XI- 8
1105 - Secretarial Order, November 1, 1974 ..... XI-11

Cocopah Indian Reservation

1106 - Act of August 17, 1961, 75 Stat. 387, Public Law 87-150 ..... XI-13

Colorado River Indian Reservation

1107 - Solicitor's Opinion, January 17, 1969 ..... XI-14
1108 - Secretarial Directive, January 17, 1969 ..... XI-20

Page

Fort Mohave Indian Reservation

1109 - Executive Order, March 30, 1870 ..... XI-22
1110 - Executive Order, September 19, 1890 ..... XI-22
1111 - Executive Order, December 1, 1910 ..... XI-23
1112 - Solicitor's Opinion, June 3, 1974 ..... XI-24
1113 - Secretary's Directive, June 3, 1974 ..... XI-25

APPENDIX XII - COLORADO RIVER BASIN PROJECT ACT

1201 - S.1658, June 4, 1968 ..... XII- 3
1202 - Colorado River Basin Project Act, September 30, 1968, Public Law 90-537 ..... XII- 9
1203 - Excerpts of the Executive Summary Report of the Westwide Study Report XII-25
1204 - Report on Annual Consumptive Uses and Losses of Water From the Colorado River System XII-39

APPENDIX XIII - MEXICAN SALINITY PROBLEM

1 F.1 - Mexican Water Treaty (See Appendix I) ..... XIII- 1
1301 - Minute No. 218, March 25, 1965 ..... XIII- 3
1302 - Minute No. 241, July 14, 1972 ..... XIII- 5
1303 - Minute No. 242, August 30, 1973 ..... XIII-10

APPENDIX XIV - COLORADO RIVER BASIN SALINITY CONTROL ACT

1401 - H.R.12834 (Administration Bill) ..... XIV- 3
1402 - H.R.12165 (House Committee Bill) ..... XIV- 5
1403 - Colorado River Basin Salinity Control Act, June 24, 1974 (Public Law 93-320, 88 Stat. 266) XIV-14

CHAPTER I

SUMMARY OF "THE LAW OF THE RIVER"

A. "The Law of the River"

"The Law of the River" as applied to the Colorado River, has evolved out of a combination of both Federal and State statutes, inter-State compacts, court decisions and decrees, contracts with the United States, an international treaty, operating criteria and administrative decisions. All of the foregoing have resulted in a division or apportionment of the waters of the Colorado River among users thereof or the rights to the "consumptive use" of the Colorado River waters.

The Colorado River has been described as the most closely regulated and controlled stream in the United States. Between 1962 and 1979, water has been released from Hoover Dam in quantities sufficient to meet only the requirements for delivery to Mexico under the Mexican Water Treaty and the downstream requirements under water delivery contracts with the Secretary of the Interior. The released water generates power but water is not presently (1978) released for the sole purpose of generating power. Consequently, there are only minimal flows in the Colorado River below Morelos Dam, the last dam on the river which was built by Mexico to divert water for use in Mexico. With anticipated very high runoff in 1979, the situation could change which would cause releases for control purposes to be made. Such additional releases could be used for generation of power.

A.1 Physical Characteristics of the Colorado River

The Colorado River rises in the mountains of Colorado and flows in a southwesterly direction for approximately 1,400 miles until it empties into the Gulf of California in Mexico. It falls some 12,000 feet in its course which provides its potential for power generation. The river flows through Colorado, Utah and Arizona and along the Arizona-Nevada and Arizona-California boundaries and in the "limitrophe section"; i.e., the boundary between Arizona and Mexico. Significant amounts of water are added by tributaries which originate in the States of Wyoming, Colorado, Utah, New Mexico, Nevada and Arizona, but not in California. In the late 1800's and early 1900's, there was commercial navigation on the river.

The river and its tributaries drain portions of seven States: Wyoming, Colorado, Utah, New Mexico, Arizona, California and Nevada, or a vast area of approximately 242,000 square miles, about one-twelfth the area of the continental United States, excluding the States of Alaska and Hawaii. This large basin is approximately 900 miles long and 300 miles wide in the northern part and 500 miles wide in the southern part. Most of it is so arid that the viability of numerous communities in it is largely dependent upon the controlled and managed use of the Colorado River System and the availability of its water to make it productive and inhabitable. The upper portion is one of high elevations, narrow valleys, and a short growing season. The lower portion has lower elevations, wide basins and deserts, and a long growing season. While not a part of the natural drainage area, an additional area of 7,500 square miles, which includes the Imperial and Coachella Valleys in southern California, is considered to be a part of the Lower Colorado River Basin. Population within the drainage area is approximately 2.5 million but through water exports from the river and tributaries nearly 12 million people receive a supplemental water supply from the river.

A canyon section in northern Arizona and southern Utah permits a convenient division of the Colorado River Basin. As described in Article II of the Colorado River Compact of 1922, the Colorado River Basin is divided into the Upper Basin, where waters naturally drain into the Colorado River above Lee Ferry, and the Lower Basin, where waters drain into the Colorado River below Lee Ferry. Lee Ferry, the boundary between the Upper and Lower Basins, is in northern Arizona approximately 1 mile downstream from the Paria River or 17 miles below the Glen Canyon Dam.

A.2 Water Supply

The unregulated flow of the river, uneven and unpredictable, varies widely during the year, from year to year, and over long periods of years. Water supply studies of virgin or undepleted flow at Lee Ferry show a maximum of 24 million acre-feet per year (maf/yr) in 1924 and a low flow of 5.5 maf in 1977. The long-term average virgin flow of the river at Lee Ferry, from the turn of the century to the present, averages 14.7 maf/yr. However, the bulk of the high flow occurred during the early part of this century so that the average virgin flow from 1896 to 1930, a "wet" period, was about 17 maf/yr whereas the average virgin flow from 1930 to the present time, a "dry" period, was about 13 maf/yr. The 10-year wettest period saw an average annual virgin flow of 18.8 maf in 1914-1923. The driest 10 years saw an average annual flow of 11.8 maf.

Since more accurate measurements of the flow at Lee Ferry were commenced in 1922, the flows have averaged about 14 maf/yr. This range of flows is significant. For example, the Compact negotiators in 1922 divided what was thought to be a water supply of 16 maf/yr between the Upper and Lower Basins on the assumption that the flows were in excess of that amount. Since 1922 estimates of the river's flow have steadily been revised downward to approximately 14 maf. The lower average river flows; i.e., a shrinking supply coupled with an increasing demand, have contributed greatly to the water problems that arose in later years (see Appendix 1 A.2 for Bar Chart of Water Supply).

A.3 Early River Development

In the late 1800's developers in the Imperial Valley of California devised plans to divert water from the Colorado River and to irrigate Imperial Valley lands by gravity flow. Diversion works were completed in 1901 for that purpose as a private undertaking. In 1903 80,000 acres were irrigated and in 1920 there were 400,000 irrigated acres. Today there are 500,000 irrigated acres.

Following notices of appropriations filed in 1877 by Thomas Blythe, diversion works were also begun by private developers in the Palo Verde Valley in California. Private canal companies also began irrigation in Arizona as early as 1890 in the Yuma Valley and in 1905 in the North Gila Valley.

After the passage of the Reclamation Act of 1902, investigations were started to determine the feasibility of large, Federal irrigation projects. The Yuma Reclamation Project in Arizona and California was authorized in 1904 and the first Colorado River water was delivered to it in 1907. By 1920, irrigation works constructed primarily by private enterprise, especially in the Imperial and Palo Verde Valleys of California, had expanded to such an extent that the unregulated flow of the Colorado River was completely utilized during periods of low flow so that further expansion was dependent upon construction of storage reservoirs on the river.

The erratic flows of the river, its tendency to destructive flooding and its high silt load limited its usefulness for a dependable year-round water supply without some flood control and storage facilities, both of which were beyond the means of local entities and the States. Before construction of Hoover Dam, which was completed in 1935, the lower reaches of the Colorado River were subjected to severe annual floods. This menace was fully realized in 1905 when the Colorado River, swollen by floodwaters, broke through a cut several miles below the International Boundary, which had been made by the early developers of the Imperial Valley in California. For 16 months it flowed into the fields of the Imperial Valley enlarging the Salton Sea, approximately 490 square miles in area, and threatened to engulf the entire valley. The break was finally closed largely through the efforts of the Southern Pacific Railroad Company but only after 30,000 acres of arable land had been inundated, farms ruined, homes destroyed, highways washed away, and railroad tracks destroyed. This tragic occurrence, indicating the need for flood control of the lower Colorado River, became a motivating reason for the construction of Hoover Dam. That, plus problems in maintenance of the distribution facilities to Imperial Valley because its diversions of water were through facilities in Mexico, led to demands for a canal within the United States.

In 1901 the Davis and Lippincott Report recommended studies of two major projects which actually materialized in the Boulder Canyon Project Act, a storage dam at the Boulder Canyon site and a canal from the Colorado River to the Imperial Valley in California.

In 1918, under a contract with the Imperial Irrigation District, the All-American Canal Board, chaired by Dr. Meade, recommended legislation which would authorize a high dam for the storage of Colorado River water and an All-American Canal to Imperial Valley.

This led to the Kincaid Act in 1920 (41 Stat. 600) which authorized the Secretary of the Interior to make a study of the diversion and use of Colorado River waters. This resulted in the Fall-Davis Report in 1922, entitled "Problems of Imperial Valley and Vicinity" (Senate Document No. 142, 67th Congress, Second Session). The report recommended the All-American Canal and a storage dam in the Lower Basin, rather than in the Upper Basin, as the best possible site for flood control, storage, and a power development nearest to the markets for power in southern California. Its data were also used by the negotiators of the Colorado River Compact. The Fall-Davis Report stated that the Colordo River problems "... are of such magnitude as to be beyond the reach of other than a national solution." And, finally, in 1924, the Weymouth Report spelled out the details of what soon became the Boulder Canyon Project.

B. Colorado River Compact

B.1 Background

The rapidly expanding use of Colorado River water in California was viewed with increasing alarm by officials in the Upper Basin States. As a consequence of their concern, the League of the Southwest was organized in 1919 to promote the orderly development and equitable division of the waters of the Colorado River. Congress approved the Kincaid Act in 1920 (41 Stat. 600) directing the Secretary of the Interior to make a full and comprehensive study and to report on the possible diversion and use of waters of the Colorado River.

During the period when the studies by the Secretary were being conducted, negotiations were underway by the seven Basin States for an inter-State agreement on the waters of the river which led to the Colorado River Compact. While it was recognized that storage on the river was essential, the Upper Basin States faced the possibility that water conserved by storage would be put to use in the Lower Basin more rapidly than the Upper Basin could utilize its share of the normal flow and thus form the basis for Lower Basin claims of appropriative rights in the water. Hence, the Upper Basin insisted that rights to some of the Colorado River flows be reserved for their future benefit. This could be done by a suit in the Supreme Court for equitable apportionment or by agreement of the parties, although the latter had never been used to allocate waters of an inter-State stream.

B.2 Negotiations

As a result of negotiations among the seven Basin States, it was agreed that an inter-State compact would establish an equitable apportionment of the waters and protect the Upper Basin States. Each of the seven Basin States adopted the authorizing legislation in 1921 and Congress consented to the negotiations by legislation enacted on August 19, 1921 (42 Stat. 171). The Colorado River Compact Commission convened in January 1922. Herbert Hoover, then Secretary of Commerce, was elected chairman.

The Upper Basin's fears and the wisdom of the decision to attempt an inter-State agreement was demonstrated when the Supreme Court of the United States on June 5, 1922, in *Wyoming* v. *Colorado*, 259 U.S. 419, upheld the doctrine of priority of appropriations regardless of State lines.

B.3 Major Compact Provisions

After 27 meetings, a final agreement on the Compact was signed in Santa Fe, New Mexico, on November 24, 1922. Although the States had hoped to allocate the Colorado River waters among each of the seven Basin States, such agreement was not possible. However, the Colorado River Compact did negotiate a historic document. It had the following major provisions:

(1) Article I states the purposes of the Compact.

(2) Article II(a) defines the "Colorado River System" as "that portion of the Colorado River and its tributaries within the United States of America."

(3) Article II(b) defines the "Colorado River Basin" as "all of the drainage area of the Colorado River System and all other territory wihin the United States of America to which the water of the Colorado River System shall be beneficially applied."

(4) Article II(c) defines the term "States of the Upper Division" as "the States of Colorado, New Mexico, Utah, and Wyoming."

(5) Article II(d) defines the term "States of the Lower Division" as "the States of Arizona, California, and Nevada."

(6) Article II(e) defines "Lee Ferry" as "a point in the mainstream of the Colorado River one mile below the mouth of the Paria River."

(7) Articles II(f) and (g) define the terms "Upper Basin" and "Lower Basin," thus dividing the Colorado River Basin into these two basins.

(8) Article II(h) defines "domestic use" as including "the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but shall exclude the generation of electrical power."

(9) Article III(a) apportions from the Colorado River System, in perpetuity, the exclusive beneficial consumptive use of 7.5 maf/yr to each of the two Basins for beneficial consumptive use.

(10) Article III(b) provides that, in addition to the III(a) apportionment, the Lower Basin was given the right to increase its beneficial consumptive use by 1 maf/yr.

(11) Article III(c) provides that if (as has proved to be the case) the United States shall recognize the right of Mexico to the use of any waters of the Colorado River System, such waters shall first be supplied from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs III(a) and (b). It also provided that if such surplus shall prove insufficient for this purpose, the Mexican deficiency is to be borne equally by the Upper and Lower Basins, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half the deficiency so recognized in addition to that provided in paragraph (d).

(12) Article III(d) provides that the Upper Division States "will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of 10 consecutive years..."

(13) Article III(e) provides that the Upper Division States shall not withhold water, and the Lower Division States shall not require the delivery of water, which cannot reasonably be applied to domestic and agricultural use.

(14) Article IV(a) provides that since the Colorado River had ceased to be navigable the use of Colorado River water for navigation shall be subservient to the uses of such waters for domestic, agricultural and power purposes.

(15) Article IV(b) provides that the impoundment and use of waters for the generation of electrical power shall be subservient to the use and consumption of such water for agricultural and domestic purposes.

(16) Article VII provides that nothing in the Compact shall be construed as affecting the obligations of the United States to Indian Tribes.

(17) Article VIII provides that present perfected rights to the beneficial use of waters of the Colorado River System are unimpaired by this compact.

(18) Article XI provides that the compact shall become binding and obligatory when it shall have been approved by the legislatures of each of the signatory States and by the Congress of the United States.

Although the river had produced an average flow for the two decades preceding 1922 that would have accommodated 16 maf/yr in beneficial consumptive use annually from the waters of the Colorado River System for the two Basins, the Upper Basin (by virtue of Article III(d) of the Compact) assumed the burden of drier cycles occurring thereafter. Hence, the Lower Basin has received a guaranteed 10-year (not annual) minimum flow of 75 maf at the Lee Ferry compact point. The Upper Basin became a guarantor in the sense that its depletions may not reduce the 10-year aggregate flow below the 75 maf at the Lee Ferry compact point.

B.4 Compact Approval

The Compact was signed by each of the seven Basin States. Six of the seven States ratified the Compact in 1923 but Arizona did not ratify it until 1944, 21 years later. In 1925, four ratifying States modified the requirement for seven State approval and ratified the Compact which was to become effective upon approval

of at least six States and the consent of the United States. Utah and California took the required action in 1929. The United States approval of the Compact was contained in Section 13(a) of the Boulder Canyon Project Act of 1928 (see House of Representatives Document No. 605, 67th Congress, 4th Session, March 2, 1923; see Appendix 1 B.4 for text of Compact).

B.5 California Limitation Act

The consent of the United States to the Compact was conditioned by Section 4(a) of the Boulder Canyon Project Act upon California passing a Limitation Act whereby the required storage dam would be built only if California would agree "irrevocably and unconditionally" to limit her annual consumptive use of Colorado River water to 4.4 maf/yr of the 7.5 maf/yr apportioned to the Lower Basin by Article III(a) of the Colorado River Compact, plus not more than one-half of any excess or surplus waters unapportioned by the Compact. California met this requirement by passing the California Limitation Act on March 4, 1929 (see Appendix 1 B.5).

In the interim period following the Colorado River Compact and the passage of the California Limitation Act, the seven Basin States attempted to settle the division of the Lower Basin water supply and to bring about a seven State ratification of the Compact. The failure to resolve these points delayed action by Congress on legislation authorizing the construction of Hoover Dam. Finally, on December 21, 1928, the Boulder Canyon Project Act was enacted (45 Stat. 1057) notwithstanding the failure of Arizona to ratify the Compact and the inability of the States of the Lower Basin to agree on the division among themselves of the allocation of Colorado River water. By proclamation dated June 25, 1929, President Hoover declared the Boulder Canyon Project Act effective as of that date (see Appendix 1 B.6 for text of the Boulder Canyon Project Act).

C. Boulder Canyon Project Act (45 Stat. 1057)

C.1 Major Impact

The purposes of the Act, as stated in Section 1, were controlling the floods, improving navigation, regulation of flows, the storage and delivery of stored water for reclamation of public lands and other beneficial uses "exclusively within the United States, and for the generation of electrical energy...to make the project self-supporting and solvent."

In Section 1 Congress authorized the construction of Hoover Dam and Powerplant and the All-American Canal to Imperial and Coachella Valleys in California. Congress also consented to the Colorado River Compact (Section 13(a)). However, as noted above, Section 4(a) of the Act provided that in the absence of the seven State approval of the Compact the Act would become effective only when the Compact was approved by California and five of the other seven States, and it further provided that California would be required to limit its consumptive use to 4.4 maf of the 7.5 maf/yr apportioned to the Lower Basin by Article III(a) of the Compact, plus not more than one-half of any surplus. California did so by enactment of the California Limitation Act on March 4, 1929 (see B.5).

The Project Act, with this limitation on California, not only reserved Lower Basin water for the States of Arizona and Nevada, but it provided protection to the Upper Basin against unlimited development in the Lower Basin with prior appropriative rights to the water so used, as well as assurance that the Colorado River Compact would not be nullified.

C.2 Division of Lower Basin Water

Section 4(a) of the Boulder Canyon Project Act authorized the Lower Basin States of Arizona, California and Nevada to enter into an agreement providing that of the 7.5 maf/yr annually apportioned to the Lower Basin by Article III(a) of the Compact there shall be apportioned to:

(1) Nevada, 300,000 acre-feet annually;

(2) Arizona, 2.8 million acre-feet annually, plus one-half of any excess or surplus waters unapportioned by the Compact, and exclusive beneficial consumptive use of the Gila River and its tributaries within the boundaries of Arizona; and

(3) California, 4.4 million acre-feet annually, plus one-half of any surplus waters unapportioned by the Compact.

The three State apportionment proposal was never agreed upon by the Lower Basin States despite negotiations in 1929 and 1930. However, the Supreme Court Opinion of June 3, 1963, in *Arizona* v. *California* (373 U.S. 546) concluded that Congress had made such an apportionment by authorizing the Secretary of the Interior to accomplish this division. This was done by the Secretary's contracts for the delivery of water in the Lower Basin States and by providing (Section 5) that no person could have the use of Colorado River water without a contract with the Secretary for permanent service. This Opinion and Decree are further discussed in sections I and J hereof.

C.3 Conditions Precedent to Act

Section 4(a) of the Boulder Canyon Project Act provided that the Act shall not take effect until either all seven States signatory to the Compact had ratified the Compact or, if that ratification did not occur within 6 months from the passage of the Act, then until six States, including California, shall have ratified, and California shall have enacted legislation irrevocably limiting its consumptive use to 4.4 maf of the waters apportioned to the Lower Basin States by Article III(a) of the Compact plus one-half of any excess or surplus waters (see B.4 and B.5 above).

Section 4(b) provided that before any money should be appropriated for the construction of the dam or powerplant, or any construction work done or contracted for, the Secretary of the Interior should make provision for revenues by contract adequate to assure repayment of all expenses of operation and maintenance and the repayment of the Federal investment within 50 years from the date of completion of such works, together with interest thereon. Similarly, before any money was appropriated for construction or construction work was done on the main canal to Imperial and Coachella Valleys, the Secretary had to provide for revenues, by contract or otherwise, adequate to assure payment of all expenses of construction, operation and maintenance in the manner provided in the Reclamation Law.

C.4 Other Major Provisions

Section 2 created the Colorado River Dam Fund through which all appropriations ($165 million were authorized) and income were to pass. Hoover Dam and the All-American Canal accounts were to be separately maintained. Hoover power revenues were not to pay for any canal costs; lands benefiting from the canal were to repay its costs but were not to be charged for water or for its use, storage or delivery.

All costs of Hoover Dam, its powerplant, and appurtenant structures, including interest at 4 percent, were reimbursable, but $25 million was allocated to flood control to be repayable out of 62½ percent of the surplus revenues during the 50-year amortization period. Pursuant to Section 4(b), 18-3/4 percent of excess revenues was to be paid to each of the States of Arizona and Nevada, in lieu of taxes which the States might have collected if the project had been built with other than Federal funds. After repayment of all costs, charges were to be made on such basis and revenues expended within the Basin as hereafter prescribed by Congress. These provisions were changed by the Boulder Canyon Project Adjustment Act (see C.6).

The All-American Canal costs were required to be repaid under Reclamation Law in 40 years without interest. In addition, the $1.6 million of Laguna Dam costs were also to be repaid, even though it was never used as a diversion structure for Imperial Valley.

C.5 Power Contracts

Section 6 of the Act provided that energy was to be disposed of by contract. Section 5 provided that the disposition of energy by the Secretary be done under general and uniform regulations conforming essentially to those of the Federal Power Commission to "responsible applicants" under established standards of

preference; e.g., to public bodies and States. The contracts were not to be longer than 50 years from the date at which energy is ready for delivery. The contracts were to be subject to readjustment at the end of 15 years and each 10 years thereafter as justified by competitive conditions at distributing points or competitive centers.

Arbitration of disputes was provided for in Section 5(a). Section 5(b) contained provisions dealing with renewal of the contracts.

C.5.1 Implementation of Power Contract Authority

Before negotiating the power contracts, the Secretary had to determine: the project costs (estimated at $206 million to be repaid in 50 years at 4 percent interest); the quantity of water available for power generation and the quantity of energy (estimated at 4.24 billion kilowatt-hours (kWh), diminishing 8.76 million kWh annually due to increased Upper Basin use of water and silting at Hoover Dam); and the competitive value of energy in southern California as fixed by oil and gas (estimated at 1.63 mils per kWh).

On April 26, 1930, the Secretary executed two contracts for 64 percent of the firm energy which was enough to satisfy the revenue requirements of the Boulder Canyon Project Act; a lease of power privileges with the City of Los Angeles Department of Water and Power and the Southern California Edison Company, Ltd.; and a contract for the purchase of energy with The Metropolitan Water District of Southern California (MWD).

By November 1931, the contracts for the sale of energy were executed under which the following allocations were made in terms of 4,240,000,000 kWh of firm energy annually:

Arizona	18 percent
Nevada	18 percent
MWD	36 percent
Los Angeles	14.9 percent
Pasadena	1.61 percent
Glendale	1.88 percent
Burbank	.58 percent
So. Cal. Edison	7.2 percent
So. Sierra Power Co.	.9 percent
L.A. Gas and Elec. Co.	.9 percent

These percentages were later changed slightly when 90 million kWh were added to firm energy generation estimates with the height of the dam increased.

The California contractors were obligated for 100 percent of the firm energy but were required to yield 36 percent thereof to Arizona and Nevada when required by those States. Los Angeles and Southern California Edison Company were required to take all energy not contracted for by the States.

By 1940 Nevada had contracted for its 18 percent allotment. Arizona contracted for its 18 percent allotment in 1945.

Storage of water began in Lake Mead on February 1, 1935. Power generation began September 11, 1936, although the 50-year period covered by the power contracts began June 1, 1937 (for more details on Boulder Canyon Project power contracts see Chapter III).

C.6 Boulder Canyon Project Adjustment Act

This Act of July 19, 1940, 54 Stat. 774, was prompted by a request from the power allottees for a review of the power rates. During the 7 years between execution of the power contracts and the delivery of energy several factors had developed. The competitive value of Boulder Dam energy had fallen because of improvements in the art of generating power by steam, decreases in the cost of fuel and in the capital costs of steamplants. Further, the Bureau of Reclamation in the Reclamation Project Act of 1939 adopted the policy

of dropping the competitive rate base for a rate fixed by the amount needed to amortize the investment allocated to power, plus costs of operation, maintenance and replacement.

The Adjustment Act substituted for the old rate adjusted periodically by competitive conditions a rate stabilized for the 50-year period from June 1, 1937, to May 31, 1987, sufficient to meet: operation, maintenance, and replacement costs; repayment to the Treasury of reimbursable advances, including interest which was reduced from 4 percent to 3 percent; $300,000 paid annually to each of the States of Arizona and Nevada in commutation of the share of excess revenues provided for those States by Section 4(b) of the Project Act; and payment of $500,000 annually to the Colorado River Development Fund.

Repayment of the $25,000,000 allocated to flood control by Section 2(b) of the Project Act was deferred until June 1, 1987, without interest, after the 50-year repayment period, after which time repayment shall be as determined by Congress.

Among other features of the Act was a provision (Section 2(b)) for reduction of payments to Arizona and Nevada if the project or features of it were taxed by the States or its political subdivisions. This provision was utilized in 1970 when Clark County, Nevada, attempted (unsuccessfully) to tax the interests of the City of Los Angeles and The Metropolitan Water District in the Project.

Another provision (Section 9) authorized the Secretary to substitute an agency operating agreement for the lease held by the City of Los Angeles and the Southern California Edison Company. The agency contract was executed May 29, 1941. Nine energy contracts were entered into on the same date (the Arizona contract was executed November 23, 1945). These were with the States of Nevada and Arizona; the public agencies of Pasadena, Burbank, Glendale, Los Angeles and The Metropolitan Water District; and these utilities: Southern California Edison Company and California Electric Power Company (see Appendix 1 C.6 for text of Boulder Canyon Project Adjustment Act).

C.7 Water Delivery Contracts - General

The basis of the Secretary's contracting authority is Section 5 of the Boulder Canyon Project Act. It authorizes the Secretary of the Interior to contract for the storage of water in the reservoir created by the Dam and for the delivery thereof for irrigation and domestic use. The Act further provides that such contracts shall be for "permanent service." And, of particular importance, the Act provides:

> "No person shall have or be entitled to have the use for any purpose of the water stored as aforesaid except by contract made as herein stated."

C.7.1 Implementation of Water Delivery Contract Authority

Since The Metropolitan Water District was assumed to be a major purchaser of Hoover Dam energy for the purpose of pumping water to southern California via its proposed Colorado River Aqueduct, a power contract for that purpose required a water delivery contract between the Secretary and MWD. Also, to permit Imperial Irrigation District (IID) to contract for repayment of construction of the All-American Canal, a water delivery contract with IID was needed. Hence the need arose for negotiation of water delivery contracts by the Secretary.

D. California Seven Party Agreement

Before the Secretary entered into warter delivery contracts under the Boulder Canyon Project Act with users in California, he requested the State to agree on a listing of the relative priorities of rights among the major users of Colorado River waters. This was done by the "California Seven-Party Agreement" of August 18, 1931, which contained the following priorities:

Priority	Description	Acre-feet Annually
1	Palo Verde irrigation District - gross area of 104,500 acres	
2	Yuma Project (Reservation Division) - not exceeding a gross area of 25,000 acres	3,850,000
3(a)	Imperial Irrigation District and lands in Imperial and Coachella Valleys to be served by AAC	
3(b)	Palo Verde Irrigation District—16,000 acres of mesa lands	
4	Metropolitan Water District and/or City of Los Angeles and/or others on coastal plain	550,000
5(a)	Metropolitan Water District and/or City of Los Angeles and/or others on coastal plain	550,000
5(b)	City and/or County of San Diego	112,000
6(a)	Imperial Irrigation District and lands in Imperial and Coachella Valley	300,000
6(b)	Palo Verde Irrigation District—16,000 acres of mesa lands	
	TOTAL	5,362,000

The Secretary of the Interior placed the California Seven Party Agreement of August 18, 1931, in effect by general regulations dated September 28, 1931. The provisions of the Seven Party Agreement were also incorporated by the Secretary in substantially the same form in each of the subsequent California water delivery contracts entered into by the Secretary.

Note that the first three California priorities total 3.85 maf/yr and are for agricultural uses. Note also that the first four California priorities total 4.4 maf and equate to that quantity to which California is held by its Limitation Act. The 4.4 maf is also the quantity accorded a priority over the Central Arizona Project by Section 301(b) of the Colorado River Basin Project Act (see Part M.; see Appendix 1 D.1 for text of California Seven Party Agreement).

E. Water Delivery Contracts For Colorado River Water in the Lower Colorado River Basin

During the period 1930-1934 the Secretary of the Interior, pursuant to the Boulder Canyon Project Act, executed contracts on behalf of the United States with five California agencies (Imperial Irrigation District, Palo Verde Irrigation District, The Metropolitan Water District of Southern California, Coachella Valley County Water District and the City of San Diego) for the delivery of water from Lake Mead, subject to the availability thereof, for use in California under the Compact and Project Act. As noted in D. above, the priorities assigned to each contractor and the quantities of water to be made available therefor under these contracts could, in the aggregate, call for the delivery of 5,362,000 acre-feet of water per year. There is no water delivery contract with the State of California itself similar to those with the States of Nevada and Arizona.

By contracts dated March 30, 1942, and January 3, 1944, made by the Secretary of the Interior with the State of Nevada, the United States agreed to deliver to Nevada from Lake Mead storage so much water as might be necessary to supply the State with a total quantity of water from the Colorado River System not to exceed 300,000 acre-feet per year, subject to the availability thereof for use in Nevada under the Compact and Project Act.

The State of Arizona entered into a contract with the Secretary of the Interior on February 9, 1944, wherein the United States agreed to deliver annually to Arizona and its water users from storage in Lake Mead so much water as might be necessary for irrigation and domestic uses in Arizona of a maximum of

2.8 maf/yr plus one-half of any surplus water unapportioned by the Compact, subject to the availability thereof for use in Arizona under the Compact and Project Act. Nevada was accorded the right under Article 7(f) to contract for 1/25th of any surplus water available in the Lower Basin.

The details of these contracts and of the Secretary's contracts with agencies and water users in Arizona and Nevada may be found in Chapter II hereof.

F. The Mexican Water Treaty

The possibility of a future Treaty with Mexico concerning Colorado River waters was recognized in Article III(c) of the Colorado River Compact of 1922. This provided that any right to the use of such waters accorded Mexico shall be supplied first from surplus over and above the aggregate of the quantities specified in paragraphs III(a) and (b), and if insufficient, then the deficiency shall be borne equally by the Upper and Lower Basins and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d). It was assumed at that time that a surplus of 2 maf annually would be available. (The respective obligations of the Basins under this provision is still subject to different interpretations.)

The possibility of a Treaty was again mentioned in the Boulder Canyon Project Act of 1928. Section 20 provided that nothing in the Act shall be construed as a denial or recognition of any rights, if any, in Mexico to the use of waters of the Colorado River System.

In 1922 Mexico used 500,000 acre-feet of Colorado River waters annually. By 1935, when Hoover Dam was finished, Mexico used 750,000 acre-feet annually. By 1944 that use had risen to 1.5 maf annually. Efforts to negotiate an agreement with Mexico failed in 1930 when Mexico claimed 4.5 maf and the United States offered 750,000 acre-feet. However, negotiations initiated in 1941 did result in the 1944 Treaty. That Treaty linked the waters of the Rio Grande River (much of whose waters originate in Mexico but is used in the United States) with the Colorado River waters (all of which originates in the United States). Impetus to a Treaty was provided by the scheduled organizational meeting of the United Nations and by the fact that Mexico was a wartime ally of the United States.

The Committee of Fourteen (two representatives from each of the seven Basin States) had proposed deliveries to Mexico of 800,000 acre-feet each year the releases from Lake Mead total 10 maf plus a percentage change when Lake Mead releases were more or less than 10 maf. Of the seven Basin States California and Nevada opposed the 1.5 maf adopted by the two countries. The other Basin States supported it in order to limit Mexico before her increasing uses invaded their share of Compact water.

Article 10 of the Treaty guarantees to Mexico a minimum quantity of 1.5 maf of Colorado River water annually, to be delivered in accordance with schedules furnished in advance by Mexico. The need for the schedules was to require Mexico to take minimum flows which comprised leakage from Imperial Dam and return flows below Imperial Dam which could not be controlled in any event. If there is a surplus, as determined by the United States, an additional 200,000 acre-feet may be provided, but Mexico acquires no rights to more than 1.5 maf.

In the event of an extraordinary drought, Mexican deliveries will be reduced in the same proportion as consumptive uses in the United States are reduced. Even in the drought years of 1976-77 this provision was not utilized nor is it settled whether water in storage in United States reservoirs may be protected or must be released to satisfy the Treaty obligation.

The question of the quality of the water has been a source of controversy. Article 10 refers to "waters of the Colorado River, from any and all sources..." Article 11 states that the waters to be delivered shall be made up of the waters of the river, "whatever their origin..." The United States has construed the Treaty to mean that Mexico can be given waters of any quality; i.e., return flow or seepage, whether usable or not. The Mexican view is that the water has to be usable and of a quality equal to that delivered to the United States users. The Mexican salinity problems are covered in O. of this Chapter I and in Chapter VI hereof.

Mexico was required by Article 12 to construct a diversion structure below the upper boundary line, which it did by building Morelos Dam, and protective works to prevent damage to United States lands. The United States was to build a regulating dam which it did by constructing Davis Dam.

Article 13 dealt with flood control plans. Article 15 contained schedules of deliveries.

Article 24(d) authorized the International Boundary and Water Commission to settle all differences that may arise in the "interpretation or application of this Treaty, subject to the approval of the two Governments." This provision was relied upon by Ambassador Brownell after negotiating Minute No. 242 to explain why Senate approval was not sought in the final and permanent solution to the salinity problem. The Ambassador stated that the approval of the United States Government to the required authorizing legislation and Congressional appropriation of funds would satisfy the provisions of the Treaty.

On April 18, 1945, the Senate ratified the Treaty with reservations. On November 27, 1945, President Truman proclaimed the Treaty in force as of November 8, 1945 (see Appendix 1 F.1 for text of Mexican Water Treaty).

G. The Upper Colorado River Basin Compact

While the Lower Basin States were unable to agree upon an internal division of the Colorado River waters apportioned to the Lower Basin by the Colorado River Compact of 1922, the Upper Basin States were able to agree upon such a division in order that development could be initiated in those States.

On October 11, 1948, the Upper Basin States entered into a Compact which followed the format and was subject to the provisions of the 1922 Colorado River Compact.

Article III apportioned to Arizona the consumptive use of 50,000 acre-feet of water annually and to the following States the following percentages of the total quantity available for use each year by the Upper Basin under the Colorado River Compact and remaining after deduction of the use, not to exceed 50,000 acre-feet per annum, made in Arizona;

Colorado	51.75 percent
New Mexico	11.25 percent
Utah	23.00 percent
Wyoming	14.00 percent

Article IV provides that in the event curtailment of use of water by the Upper Division States becomes necessary in order that the flow at Lee Ferry shall not be depleted below that required by Article III of the 1922 Compact, the extent of curtailment by each State shall be determined by the Commission (established at Article VIII) upon the application of stated principles.

Article V established principles governing the application of the loss of water from storage in reservoirs.

Article VI provided that the Commission shall determine the quantity of the consumptive use of water by the inflow-outflow method in terms of manmade depletions of the virgin flow at Lee Ferry, unless a different method of determination is adopted by unanimous action. This differs from the Lower Basin formula of "diversions less return flows" (see Senate Document No. 8, 81st Congress, 1st Session, January 31, 1949).

Article VIII created an inter-State administrative agency known as the "Upper Colorado River Commission" and enumerated its powers. The Commission is composed of one member from each of the above-named four States and one Commissioner named by the President of the United States (see Appendix 1 G.1 for text of Upper Colorado River Basin Compact).

H. The Colorado River Storage Project Act

Following the Upper Colorado River Basin Compact of 1948, Upper Basin Project reports were prepared in 1951 and 1952. However, it was not until April 11, 1956, that the Colorado River Storage Project Act became law, 70 Stat. 105. At the time of passage of the Act, Lower Basin development had proceeded more rapidly than had the Upper Basin. Laguna Dam, Hoover Dam, Davis Dam, Parker Dam, Imperial Dam, the Colorado River Aqueduct and the All-American Canal had been constructed in the Lower Basin.

The purpose of the Colorado River Storage Project Act was to develop the water resources of the Upper Basin. It provided a comprehensive, multiple-purpose, Basin-wide water resource development plan.

Section 1 provided for four storage projects for river regulation and power production:

Glen Canyon	on the Colorado River in Arizona;
Flaming Gorge	on the Green River in Utah;
Navajo	on the San Juan River in New Mexico; and
Curecanti	on the Gunnison River in Colorado.

It also authorized 11 participating projects for irrigation and related uses and further investigation of other projects.

Section 5 established the Upper Colorado River Basin Fund into which revenues collected in connection with the operation of the storage project and participating projects are to be credited and are to be available for repaying the costs of operation, maintenance, and replacement of, and emergency expenditures for, all facilities of said projects, payment from which for Hoover Dam Powerplant deficiencies pursuant to the Filling Criteria has upset the Upper Basin States.

Section 7 provided that the hydroelectric powerplants and transmission lines authorized by the Act shall be operated in conjunction with other Federal powerplants, present and potential, so as to produce the greatest practicable amount of power and energy that can be sold at firm power and energy rates, but in the exercise of that authority the Secretary shall not affect or interfere with the operation of the provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act and any contract lawfully entered into under said Compacts and Acts. This section was relied upon by the Lower Basin States as protecting their power contracts when the Filling Criteria was promulgated on April 12, 1962 (see L. hereof).

Section 14 required that in the operation and maintenance of all facilities authorized by Federal law in the Colorado River Basin, the Secretary is directed to comply with the Compacts and Acts enumerated in Section 7 and with the Mexican Water Treaty in the storage and release of water from reservoirs in the Basin. It further authorized any Basin State to sue in the Supreme Court to enforce these provisions and consented to the joinder of the United States as a party.

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

The Project Storage Units have these major functions:

(1) To regulate streamflows so that water commitments to the Lower Basin can be met in dry periods without curtailment of development of water uses apportioned to the Upper Basin; and

(2) To provide hydroelectric power and produce revenues to assist in the payment of the participating projects.

Further details are contained in Chapter III entitled "Power Contracts" (see Appendix 1 H.1 for text of Colorado River Project Storage Act).

I. Arizona v. California

Following execution of the Arizona Water Delivery Contract on February 9, 1944, the Bureau of Reclamation, in cooperation with Arizona, studied the Central Arizona Project (CAP). An Interior report submitted to Congress on September 16, 1948, concluded that CAP was feasible if Arizona's claim to water were valid, but if California's contention was found correct that Arizona's claims to water were not valid, there would be no dependable water supply for diversion to Arizona.

In the 79th through the 82nd Congresses, Arizona sought approval of CAP. Although the Senate passed CAP bills in 1950 and 1951, the House never did act. On April 18, 1951, the House Interior and Insular Affairs Committee adopted a resolution that CAP action be deferred until rights to the use of water are adjudicated or agreed upon.

The inability of the three Lower Basin States to agree on the sharing of the Colorado River Compact water and the position adopted by Congress in 1951 that it would not authorize the long sought Central Arizona Project, opposed by California until Arizona's right to the necessary Colorado River water supply was clarified, led to the Supreme Court suit filed by Arizona in 1952.

As a result of that Congressional action, Arizona filed a motion in the Supreme Court on August 13, 1952, for leave to file a Bill of Complaint against California and seven public agencies in the State. It alleged that Arizona's entitlement to Colorado River water was adversely affected by the California claimants and that Arizona's existing and prospective projects were threatened. The United States was permitted to intervene as was Nevada. Utah and New Mexico were joined to the extent of their capacity as Lower Basin States.

On June 1, 1954, the Court appointed George I. Haight as Special Master and on his death appointed Judge Simon H. Rifkind as Special Master on October 10, 1955. The trial before the Special Master began on June 14, 1956, in the United States Courthouse in San Francisco and concluded August 28, 1958. Following circulation among the parties of a draft report by the Special Master dated May 5, 1960, and the receipt of comments and oral arguments, the Special Master submitted his Report dated December 5, 1960, to the Supreme Court.

The Supreme Court heard oral arguments in January 1962 and reargument. On June 3, 1963, it rendered its decision, 373 U.S. 546.

The Special Master's Report and Recommended Decree were in large measure adopted by the Supreme Court, although departures were made in important areas. The major conclusions of the Court follow.

Congress, in enacting the Boulder Canyon Project Act, under its powers granted by the Commerce and Property Clauses of the Constitution, provided a solution of the Lower Basin water controversy by establishing a statutory apportionment of mainstream waters among the Lower Basin States.

The Special Master was correct in holding that the Colorado River Compact, the law of prior appropriation, and the doctrine of equitable apportionment do not control the issues of the case. Equitable apportionment was inapplicable because of the Congressional statutory allocation. The Compact was inapplicable since it provided an inter-Basin division of water and did not determine the further division of the Lower Basin's share. It was, however, relevant for some purposes, e.g., some of its terms are incorporated in the Project Act and are applicable to the Lower Basin.

The Court stated that the Project Act dealt only with the waters of the mainstream and that the tributaries were reserved to the exclusive use of the State wherein the tributaries are located.

Congress made it clear that no one should use mainstream water except in strict compliance with the scheme set up in the Act; i.e., Section 5 provided that no water could be used except under contract with the Secretary; the Secretary is bound to observe the Act's limitation of 4.4 maf on California's consumptive uses out of the first 7.5 maf of mainstream water, leaving the remaining 3.1 maf for the use of Arizona and Nevada; that Nevada's needs were 300,000 acre-feet, which left 2.8 maf for Arizona; the Congress intended that the Secretary carry out the allocation of mainstream waters among the Lower Basin States and to decide which users within each State would get water; that the Secretary has, by his contracts, made this apportionment.

The Secretary is not controlled by State law in contracting with water users within each State nor do State law priorities govern. Thus, contrary to the Master's conclusion, the priorities accorded to the water supply to Boulder City, Nevada, by the Act of September 2, 1958, were not to be determined by Nevada law.

The Court agreed with the Special Master's conclusion that the Secretary cannot reduce water deliveries to Arizona and Nevada by the amounts of their uses from tributaries above Lake Mead, since Congress intended to apportion only the mainstream waters, leaving to each State its own tributaries. The Court disagreed, however, with the Master's holding that the Secretary is powerless to charge States for diversions from the mainstream above Lake Mead (the Special Master had held that Lower Basin apportionment was to be made out of waters stored in Lake Mead or flowing in the mainstream below Lake Mead, and that the Secretary was without power to charge Arizona and Nevada for diversions made by them from the 275-mile stretch of river between Lee Ferry and Lake Mead or from the tributaries above Lake Mead). The Court held that mainstream uses between Lee Ferry and Lake Mead are subject to the Secretary's control.

The Court upheld the Secretary's right to subcontract with Nevada water users since to do otherwise would transfer to Nevada the Secretary's power to determine with whom he will contract and on what terms.

The Court disagreed with the Master and held that the Secretary had the authority to determine the methods of apportioning shortages. The Special Master had held that shortages be pro rated among the three States in accordance with the percentages allocated to them out of the 7.5 maf apportioned to the Lower

Basin. (The Court's holding was later modified by Section 301(b) of the Colorado River Basin Project Act which also provided California with a 4.4 maf priority over diversions for the Central Arizona Project.)

The Court upheld the Master's finding that the Arizona-New Mexico dispute regarding Gila River waters be decided by equitable apportionment (since the Congressional statutory apportionment of mainstream water was not applicable thereto) and that the States compromise settlement be included in the Decree.

The Court followed the "Winters Right Doctrine" that the United States, when it created the Indian Reservations along the Lower Colorado River, intended to reserve for them the waters without which their lands would have been useless. It upheld the United States claims for the quantity of water necessary to irrigate all the practicably irrigable acreage on the five Reservations along the Lower Colorado River. This was about 905,496 acre-feet for 136,636 irrigable acres.

The Court disagreed with the Special Master's decision to determine the disputed boundaries of the Colorado River Indian Reservation and the Fort Mohave Indian Reservation and delayed a ruling until a dispute develops over title because of some future refusal by the Secretary to deliver water.

The Court agreed with the Special Master that the principle underlying the reservation of water rights for Indian Reservations was equally applicable to other Federal establishments such as the Lake Mead National Recreation Area, the Lake Havasu and Imperial National Wildlife Refuges, and the Gila National Forest, and that sufficient water was reserved for the purposes for which these reservations were created.

The United States cannot claim the entitlement to the use without charge against its consumption of any waters that would have been wasted but for salvage by the Government on its wildlife refuges, because of the Project Act's command that consumptive use from the mainstream be measured by diversions less returns to the river.

Finally, the Court agreed with the Special Master that all uses of mainstream water within a State are to be charged against that State's apportionment and that included uses by the United States.

The Special Master's Report is elaborated on in Chapter VIII and the Supreme Court Opinion in Chapter IX.

J. The Supreme Court Decree in Arizona v. California

An analysis of the Report of the Special Master in *Arizona* v. *California*, dated December 5, 1960, and of the Supreme Court's Opinion dated June 3, 1963, 373 U.S. 546, appears in Chapters VIII and IX, respectively.

The Supreme Court Decree dated March 9, 1964, 376 U.S. 340, confirms Arizona's right to 2.8 maf/yr when there was sufficient mainstream water available for release, as determined by the Secretary of the Interior, to satisfy 7.5 maf/yr of consumptive use in the three Lower Basin States. The Decree apportioned 4.4 maf/yr thereof for use in California and 300,000 acre-feet annually was apportioned for use in Nevada (Article II(B)(1)).

The Decree defines "consumptive use" as "...diversions from the stream less such return flow thereto as is available for consumptive use in the United States or in satisfaction of the Mexican treaty obligation" (Article I(A)). The Decree also defined a "Perfected right" (Article I(G)) and "Present perfected rights" (Article I(H)) as a water right acquired in accordance with State law and existing as of June 25, 1929 (the effective date of the Boulder Canyon Project Act), which has been exercised by the actual diversion of water that has been applied to a defined area of land or to defined municipal or industrial works and including rights reserved for Federal establishments.

Article II(A) enjoins the United States and its officers from releasing water other than in accordance with the following order of priority:

(1) For river regulation, improvement of navigation and flood control;

(2) For irrigation and domestic uses, including the satisfaction of present perfected rights; and

(3) For power.

Provided, however, that the United States may release water for Mexico without regard to the aforesaid priorities. Note that the above order of priorities follows the provisions of Section 6 of the Boulder Canyon Project Act.

Article II(B)(2) also apportions water in excess of the 7.5 maf/yr as follows: 50 percent for use in Arizona and 50 percent for use in California, provided that if the United States so contracts with Nevada, then 46 percent of such surplus shall be apportioned for use in Arizona and 4 percent for use in Nevada.

Article II(B)(3) provides that if less than 7.5 maf/yr was available, then the Secretary, after providing for satisfaction of present perfected rights in the order of their priority dates without regard to State lines, and after consultation with the parties to major delivery contracts and State representatives, may apportion the amount remaining available, in such manner as is consistent with the Boulder Canyon Project Act and with other applicable Federal statutes, but in no event shall more than 4.4 maf/yr be apportioned for use in California including all present perfected rights.

The Decree also provides for delivery to water users only pursuant to valid contracts therefor made with such users by the Secretary (Article II(B)(5)). Article II(B)(5) does not apply to "any Federal establishment" named in Article II(D).

Article II(D) provides the following quantities of water for the benefit of the named Federal establishments:

(1) The Chemehuevi Indian Reservation—the lesser of either 11,340 acre-feet of diversions or water necessary to supply the consumptive use required to irrigate 1,900 acres;

(2) The Cocopah Indian Reservation—the lesser of either 2,744 acre-feet of diversions or water necessary to supply the consumptive use required to irrigate 431 acres;

(3) The Yuma Indian Reservation—the lesser of either 51,616 acre-feet of diversions or water necessary to supply the consumptive use required to irrigate 7,743 acres;

(4) The Colorado River Indian Reservation—the lesser of either 717,148 acre-feet of diversions or water necessary to supply the consumptive use required to irrigate 107,588 acres;

(5) The Fort Mohave Indian Reservation—the lesser of either 122,648 acre-feet of diversions or water necessary to supply the consumptive use required to irrigate 18,974 acres;

(6) Lake Mead National Recreation Area—annual quantities reasonably necessary to fulfill the purposes of the Recreation Area;

(7) Lake Havasu National Wildlife Refuge—annual quantities reasonably necessary to fulfill the purpose of the Refuge, not to exceed 41,839 acre-feet of diversions or 37,339 acre-feet of consumptive use, whichever is less;

(8) Imperial National Wildlife Refuge—annual quantities reasonably necessary to fulfill the purposes of the Refuge, not to exceed 28,000 acre-feet of diversions or 23,000 acre-feet of consumptive use of mainstream water, whichever is less; and

(9) Boulder City, Nevada—as authorized by the Act of September 2, 1958, 72 Stat. 1726.

Article III enjoins all the States and all other users of water in said States from diverting water from the mainstream, the diversion of which has not been authorized by the United States for its particular use.

Article IV deals with diversions by the State of New Mexico of tributary water available to it.

Article V requires the United States to prepare annual reports of water releases, diversions of water from the mainstream, return flows, consumptive use of such water, and the quantities delivered to Mexico, in satisfaction of the 1944 Treaty and, separately stated, in excess of Treaty requirements.

Article VI provides that the States are to furnish the Court a list of present perfected rights with claims of priority dates within each State, except those relating to Federal establishments. The Secretary is to supply similar information with respect to United States claims within each State. These States and the Secretary are to agree on "Present perfected rights" with their claimed priority dates, in terms of consumptive use, except those relating to Federal establishments. Lacking agreement, any party may apply to the Court for determination for such rights by the Court.

Article IX provides that any of the parties may apply at the foot of the Decree for its amendment or for further relief.

K. Present Perfected Rights

K.1 Background

(See Chapter X for an elaboration of the events leading up to the formulation of the Decree on Present perfected rights, dated January 9, 1979, which resolved the major aspects of this issue.)

"Present perfected rights" (PPRs) were first referred to, but not defined, in Article VIII of the Compact of 1922 as "unimpaired by this compact." The term next appeared in Section 6 of the Boulder Canyon Project Act as part of the second priority in the use of Hoover Dam and reservoir. The Special Master's Report in *Arizona* v. *California* discusses the term (see pages 152-153, 161, 234-235, and 305-310) and the Supreme Court Decree of March 9, 1964, 376 U.S. 340, defines the term in Articles I(G) and (H).

Article VI of the Decree gave the parties 2 years to agree on PPRs but this was increased to 3 years by a Supreme Court order of February 28, 1966, 383 U.S. 268.

PPRs are important because in years in which there is less than 7.5 maf of Colorado River water for consumptive use in the Lower Basin States, which has not yet occurred, PPRs are satisfied first (Article II(B)(3) of the Decree). Further, PPRs, as well as users served under existing contracts and Federal reservations, have rights prior to the Central Arizona Project, with California's priority limited to 4.4 maf/yr (Section 301(b) of the Colorado River Basin Project Act, September 30, 1968, 82 Stat. 885). PPRs will be viable after the Central Arizona Project is operational.

K.2 Negotiations

Negotiations proceeded in 1964 between the United States Departments of Interior and Justice and State representatives. The Arizona Interstate Stream Commission took the lead role for Arizona as did the California Attorney General's Office for California.

Problems were soon apparent in attempting to comply with the Decree definition of PPRs in recreating events which occurred over 30 years ago; e.g., the acres irrigated pre-June 25, 1929, or the quantities of water applied to lands pre-June 25, 1929; the fact that current points of water diversion had changed since June 25, 1929; whether the PPRs would be written with a dual limitation similar to that in the Decree, or with a single diversion figure urged by the States; and whether the "defined area of land" could be the entire area within a district.

Each State and the United States filed lists of claims with the Court. A Federal-State Task Force was created to develop relevant facts. Information was exchanged and questioned. Finally, on April 12, 1973, Interior provided Justice with a draft of proposed stipulation with a single number of acre-feet of diversions (not a dual limitation) and priority dates assigned to each claimant. Justice suggested in turn that the 1964 Decree be modified so that the PPRs for the Indian Reservations would similarly be stated in terms of a single diversion figure.

In an effort to meet Justice's objections, the States agreed to insert in each claim the number of acres to be irrigated. Due to objections from the Indian Tribes further negotiations were postponed. The Tribes challenged the accuracy of their own decreed PPRs as inadequately presented to the Master by the United States and the validity of the non-Indian claims as to their quantities of water and priority dates. They challenged the States assertion that the water supply was ample to satisfy all PPRs and claimed that the doctrine of "relation back" used by the States did not apply to the United States.

The Bureau of Indian Affairs in behalf of the Tribes also provided a study by Earth Environmental Consultants, Inc., which charged that no claim of water right had been made by the United States in their behalf during *Arizona* v. *California* for approximately 50,000 acres of land on the five Reservations even though they were irrigable. (The study did not assert that these lands were "practicably irrigable" which was the test adopted by the Court. Reclamation and the State parties questioned the adequacy of the EEC study.)

On July 2, 1976, the States reversed their prior position and agreed to subordinate all major non-Indian PPR claims (but not the miscellaneous claims which were numerous but minor) to PPRs of the Indians as stated in the Decree and to list all non-Indian claims in terms of a dual limitation. The subordination would also extend to not more than 4,225 acres of land within boundaries of Reservations which were enlarged "or are hereafter established by decree or future stipulation"; i.e., the States were not accepting the validity of the enlargements but only the formula for determining their right to water.

Further negotiations were unsuccessful and on January 19, 1977, Interior's Solicitor Austin advised the States that he was rejecting their proposed Stipulation as well as any agreement on the miscellaneous claims as urged by the States. The rejection, according to the States, was because of alleged prejudice to the Indian claims.

K.3 Back to the Supreme Court

On May 3, 1977, a joint motion was filed with the Supreme Court by Arizona, Nevada, California and the seven California public agencies which were the California defendants in *Arizona* v. *California*, seeking the Court's determination of the non-Indian PPRs under Article VI of the Court's 1964 Decree. Objections raised by the United States in its November Response to several provisions of the proposed supplemental decree (e.g., to a reference to "reasonable" use of water; to a limitation of Reservation Boundary changes by Secretarial orders; and to a cutoff date for boundary changes) were resolved by the parties. On May 30, 1978, a Joint Motion by all of the aforesaid parties, which now included the United States, was filed with the Court which moved that the Court enter the agreed upon Proposed Supplemental Decree. This included provisions which gave a priority to all Indian PPRs over the non-Indian PPR claimants except for the miscellaneous claims which were relatively minor (approximately 17,504 acre-feet) and largely subsequent to most Indian PPRs. It also contained provisions for recognition of Indian claims based on adjustments of Reservation boundaries.

K.4 Indian Intervention Motions

On December 23, 1977, the Fort Mohave, the Chemehuevi, and the Quechan Tribes (the "Three Tribes") filed a Motion for Leave to Intervene, and on April 7, 1978, filed the required Petition for Intervention. (The Petition included the Colorado River Indian Tribe which had itself removed as petitioner.) The Three Tribes claimed in their Motion to be the real parties in interest and opposed entry of the proposed supplemental decree because it irreparably damaged the Indian PPRs; that it did not solve all the issues, such as the Indian PPRs; that the proposed decree contained ambiguities; that the proposed subordination provisions which gave priority to Indian PPRs were not effective; that the Court was not fully advised by the United States of the status of the boundary claims of the Tribes; that Justice failed to present for the Tribes all of the irrigable acreage in the Reservations totalling 51,253,260 acres ("omitted acreage"); that they denied the accuracy of each major non-Indian PPR claim; and that their representation by Justice was inadequate.

The Petition of the Three Tribes also asserted much of the foregoing as well as the conflicts of interest confronting the Secretary of the Interior and the Solicitor General, the failure to communicate with the Indians, and the Government's policy of preventing full development of Indian PPRs to the detriment of the Tribes. An exhibit to the Petition showing claims for 91,400 acres and 605,300 acre-feet of water for Indian lands was presented to the Court.

On April 10, 1978, the two remaining Tribes, the Cocopah and the Colorado River Indian Tribes (the "Two Tribes") filed a separate Motion for Leave to Intervene and a Petition in Intervention. Contrary to the position of the Three Tribes, the Two Tribes stated that they approve and request the entry of the proposed supplemental decree. However, they, too, sought intervention in the litigation in order to solve all rights, both Indian and non-Indian, and asserted that the Government has inadequately discharged its duty to them and had a conflict of interest.

The Two Tribes seek to present claims under Article II(D)(5) and IX of the Decree for additional PPRs for lands that have been finally determined to be within the boundaries of their Reservations and to present PPR claims for "omitted" lands in the presentation before the Special Master. These included Cocopah claims for 883.53 acres, of which 780 acres are practicably irrigable with a diversion right of 4,969 acre-feet, and Colorado River claims for 4,439 acres, of which 2,710 are practicably irrigable with a diversion right of 18,076 acre-feet.

K.5 United States Position on Indian Intervention

The United States opposed the Three Tribes' Motion for intervention (but favored submission of their views as *amici curiae*) by a Memorandum filed February 1978 and denied each Indian argument. The United States stated it would later seek a determination of additional Indian PPR claims for land involved in Reservation boundary adjustments but would do so under Articles II(D)(5) and IX of the Decree (rather than Article VI of the Decree pursuant to which the States Joint Motion was filed). It urged that the proceedings under Article VI should be concluded which would not foreclose a later claim for "omitted" lands under Article IX.

In a later Memorandum in Opposition filed May 1978, the United States continued to oppose the Motion of the Three Tribes to intervene in order to object to the entry of the proposed decree under Article VI but stated that new non-Article VI matters, such as additional Indian PPR claims for lands in boundary adjustments and omitted lands, would not be opposed after the current Article VI proceedings were concluded by the entry of the proposed supplemental decree.

K.6 States and Other Defendants Positions on Indian Interventions

On January 25, 1978, the three States of Arizona, California, and Nevada, and the California Defendants, filed a response to the Motion of the Three Tribes for Leave to Intervene. They opposed the intervention, which they stated should be denied, because it would constitute a suit against the States without their necessary consent and because the Tribes do not qualify to intervene as a matter of right or for permissive intervention. They argued that the Tribes are adequately represented by the United States and that the Tribes should proceed under Article II(D)(5) and/or IX for recalculation of their irrigable acreage. However, they argued that *res judicata* bars any added claims for "omitted" acreages within the 1964 boundaries. They also questioned whether Secretarial orders finally determine Indian Reservation boundaries as the basis for asserting water rights which impinge on those of the State parties.

In a Response dated May 22, 1978, to the Petition of the Three Tribes for Intervention dated April 7, 1978, the three States and the California Defendants repeated their views of January 25, 1978. They called attention to the fact that the Two Tribes had contrary views to those of the Three Tribes and to the fact that the Colorado River Indian Tribes, which have almost three-quarters of the total water rights quantified for the Indian Tribes in the Court's decree, are apparently satisfied they are not prejudiced by the proceedings under Article VI.

In a response dated June 1, 1978, to the April 10, 1978, Motion of the Two Tribes to Intervene, California, Nevada, the Coachella Valley County Water District and the Imperial Irrigation District stated they still oppose the intervention motion of the Three Tribes. They again raised the argument of the States' immunity to suit and urged forthwith entry of the proposed supplemental decree. These parties, however, were willing to accede to the position of the United States on intervention: if the United States supports (or does not oppose) intervention, they will not, but only subject to condition:

- Intervention must be permissive and not as a matter of right;
- Intervention must be for limited purposes; i.e., to assert additional claims under Articles II(D)(5) and/or IX only and not to attack other, previously quantified claims, or other parts of the Decree; and
- To avoid multiple legal representation and undue delay, the United States should no longer represent the Tribes who would have private counsel.

Arizona's Response, dated June 5, 1978, to the Motion of the Two Tribes, adopted California's and Nevada's Response above, except that, on the grounds of State immunity to suit, it would not consent to intervention even though the United States will consent. It also concurred with the view that intervention must be permissive and not as a matter of right. Therefore, Arizona argued, since the United States representation of the Tribes has been adequate and zealous, private counsel is not necessary. Arizona further maintained that in large part the claims sought to be asserted by the Tribes depend for their validity upon the determination of land title disputes which should first be finalized in lower Court decisions before the United States makes claims for water rights therefor. And, finally, if intervention is allowed it should be subject to the conditions asserted by California and Nevada, above.

On June 1, 1978, The Metropolitan Water District of Southern California (MWD), City of Los Angeles, City of San Diego, and County of San Diego (collectively termed "the Urban Agencies"), filed their Response.

The Urban Agencies adopted the Response of California and Nevada, as had Arizona, and, in addition, challenged the Indian claims of increased water rights based on (1) "omitted" lands within the undisputed boundaries, and (2) additional irrigable acreage resulting from alleged boundary changes. They charged that all the increased claims in California, if allowed, would result in an Indian consumptive use entitlement exceeding the Decree rights by 237,860 acre-feet. Because of MWD's priority position in the California Seven-Party Agreement, this would potentially reduce MWD's allocation of Colorado River water by approximately 20 percent.

Although the Urban Agencies opposed redetermination of irrigable acreages within the undisputed Reservation boundaries; i.e., the "omitted" lands, they believed it timely to determine the Reservation boundary issues, including those of the Three Tribes.

However, the Urban Agencies repeated the arguments of the States Response to the effect that the Secretarial orders as to boundary changes were not binding for the purpose of establishing a claim for a Federally reserved water right which would impinge on MWD's water rights, and that this argument applied to similar claims of the Three Tribes as well. They also maintained that *res judicata* barred all claims for "omitted" lands as that issue had been fully tried in *Arizona* v. *California*.

The Urban Agencies did not oppose permissive intervention of the Two Tribes solely for the purpose of litigating additional water rights based on alleged expansion of Indian Reservation boundaries, nor the similar claims of the Three Tribes, and requested the appointment of a Special Master to adjudicate all these boundary disputes under Articles II(D)(5) and IX of the 1964 Decree. However, as did California, Nevada, Coachella Valley County Water District and Imperial Irrigation District, they attached conditions thereto. The proposed supplemental decree should, they said, be entered now under Article VI and if the Tribes are allowed to intervene with independent counsel that the United States not be allowed concurrently to represent the Tribes as trustee.

K.7 Supreme Court Hearing and Supplemental Decree

On October 10, 1978, the Supreme Court heard oral arguments from the various parties to the aforesaid Motions, Petitions and Responses. On January 9, 1979, in a Per Curiam Opinion, the Court ordered that the Joint Motion of the United States, Arizona, the California Defendants, and Nevada to enter a supplemental decree (filed May 30, 1978) is granted, and entered the supplemental decree which was the subject of Article VI of the 1964 Decree and of negotiation and argument since that time.

The Court appointed Judge Elbert P. Tuttle as Special Master with authority to fix the time and conditions for the filing of additional pleadings and to direct subsequent proceedings.

The Court denied the motion of the Fort Mohave Indian Tribe, *et al.*, for leave to intervene to oppose entry to the supplemental decree, and referred this motion in all other aspects and the motion of the Colorado River Indian Tribes, *et al.*, to the Special Master.

A copy of the supplemental decree appears in Appendix 1005.

K.8 New Phase of Decreed Rights

Even before the Supreme Court had resolved the Article VI PPRs by its supplemental decree of January 9, 1979, the United States on December 21, 1978, filed a Motion for Modification of the Decree (of March 9, 1964) and Supporting Memorandum. The motion sought to permit additional diversions of mainstream water for the five Reservations.

The reasons therefore were:

(1) The boundaries of the Reservations "have been finally determined..."

(2) The boundary adjustments, effected since the Decree of March 9, 1964, have confirmed additionally practicably irrigable lands for which the United States reserved water rights, as follows:

Fort Mohave Reservation	3,000 acres in California
Chemehuevi Reservation	150 acres in California
Colorado River Reservation	3,110 acres in California
Fort Yuma Reservation	4,200 acres in California
	1,300 acres in Arizona
Cocopah Reservation	1,112 acres in Arizona

(3) There are within the boundaries of the Reservations practicably irrigable lands which, in approximate numbers, were erroneously omitted from consideration and are entitled to reserved water rights:

Fort Mohave Reservation	100 acres in California
	1,000 acres in Arizona
	150 acres in Nevada
Chemehuevi Reservation	500 acres in California
Colorado River Reservation	2,000 acres in California
	13,000 acres in Arizona
Fort Yuma Reservation	500 acres in California
Cocopah Reservation	33 acres in Arizona

(4) The Reservations are entitled, with the priority dates recited in Article II of the March 9, 1964, Decree, to additional annual diversions for:

Fort Mohave Reservation	20,026 acre-feet in California
	6,460 acre-feet in Arizona
	969 acre-feet in Nevada
Chemehuevi Reservation	3,880 acre-feet in California
Colorado River Reservation	30,854 acre-feet in California
	89,940 acre-feet in Arizona
Fort Yuma Reservation	31,352 acre-feet in California
	8,668 acre-feet in Arizona
Cocopah Reservation	7,294 acre-feet in Arizona

The Motion alleged jurisdiction under Articles II(D)(5) and IX of the Decree.

The United States Memorandum in Support stated that its Motion did not seek to reexamine the prior allocations; that the court need not redetermine the boundaries or review administrative action fixing them; that the Court decree additional water, at a rate per acre previously fixed, for the acres confirmed to each Reservation; that the only issue is whether the acreage is "practicably irrigable"; and that a similar process be used for the "omitted" lands.

Thus, the issues for this subsequent phase of Present Perfected Rights are taking shape.

L. Filling Criteria

As construction progressed on the Upper Basin storage units authorized by the Colorado River Storage Project Act of April 11, 1956, 70 Stat. 105, including Glen Canyon Dam, Secretary of the Interior Udall, in consultation with various interests in the Colorado River Basin, initiated studies to determine how Lake Powell could accumulate storage with the least possible disruption of the many activities, including power production at Hoover Dam, then dependent upon the flow of the river not being restricted in the Upper Basin.

Starting in October 1957, meetings of Basin States representatives were held with Interior officials at which hydrological data was considered. These were later refined by engineering groups of both Basins. Among the conflicting Upper and Lower Basin views were the obtaining of minimum power head at Glen Canyon Reservoir (elevation 3490 or 6.1 maf) at the earliest practicable time and at the same time dealing with any deficiency that might occur in the firm energy generation at Hoover Powerplant incident to filling the Upper Basin Storge Project reservoirs.

On January 16, 1960, Reclamation proposed a set of principles and operating criteria (later termed "Filling Criteria"). These, it should be noted, were based upon a reasonable exercise of Secretarial discretion without attempting to define the outer limits of either rights or obligations of any of the States or of the United States. These principles were issued February 12, 1960, and were revised following receipt of comments and suggested modifications in a series of meetings extending from March 1960 to May 1961.

On April 2, 1962, Secretary Udall approved Reclamation's redraft of the general principles which appeared in the Federal Register of July 19, 1962, 27 F.R. 6851.

The most controversial of the principles was No. 5, which was that an allowance should be made for computed deficiency in firm energy generation at Hoover which might be caused by the four storage units in the Upper Basin; i.e., Glen Canyon, Flaming Gorge, Curecanti, and Navajo, but excluding the effects of evaporation from the surface of such reservoirs as a part of the theoretical streamflow used in the formula for computing allowance. (The initial draft considered only the presence of Glen Canyon on the river and was silent regarding evaporation losses.)

The allowance for computed deficiencies in Hoover firm energy is the difference between two calculations—the first in the so-called Hoover basic firm, which is the firm energy that would have been produced at Hoover without the four storage reservoirs on the river and using an overall efficiency factor for power operations of 83 percent. The second calculation would be to adjust the energy actually generated at Hoover to an efficiency factor of 83 percent (rather than 70-78 percent efficiency actually experienced).

The Secretary would determine how the allowance would be accomplished; i.e., (1) monetarily, if the incremental cost, that is, fuel replacement cost of generating substitute energy, is less than the selling rate for power from the Upper Basin projects, or (2) whether it might be well to compensate the Hoover Dam power contractors with kilowatt hours through the interconnection of the two power systems.

This principle, in particular, was vigorously attacked by the Upper Basin States as without legal basis and as implying a responsibility on the Upper Basin for energy deficiencies at Hoover which they denied. However, Principle No. 5 made provision for reimbursing the Upper Basin Fund after 1987 from Hoover Dam power revenues for purchasing power to meet Hoover deficiencies, but not for nonfirm or other energy from the storage project's powerplants. Interior's intention to secure reimbursement was reflected in an Additional Regulation No. 1 to the General Regulations for Generation and Sale of Power in accordance with the Boulder Canyon Project Adjustment Act, adopted by Secretary Udall on July 12, 1962, 27 F.R. 6850, which stated that the rates to be charged for electric energy after 1987 would include a component to return to the United States funds adequate to reimburse the Upper Basin Fund. No interest would be included in the reimbursement. Reclamation indicated its intention to make minimum use of dollars and maximum use of energy from Federal powerplants, but not firm energy which would otherwise be sold at firm power rates.

The principles would be applicable during the filling period, defined as the time required to fill Glen Canyon (elevation 3700), with a cutoff date of May 31, 1987, the date when the Hoover power contracts expire. Provision was also made for earlier termination if conditions warranted and called for consultation with the States before such action.

During the filling period, uses of water below Hoover Dam, other than power, will be satisfied, including delivery of not more than 1.5 maf/yr to Mexico.

Minimum power head (elevation 3490 - 6.1 maf available surface storage) would be sought at Glen Canyon at the earliest practicable time without drawing Lake Mead below its rated head (elevation 1123 - 14.5 maf available surface storage).

The partial closure of Glen Canyon Dam was accomplished March 31, 1963, when computation of Hoover deficiencies began, at which time Lake Mead held 22.3 maf. This dropped to 15.4 maf at the end of January 1964. Lake Powell was about 3410 (80 feet short of the minimum power point of 3490). With the forecast of another poor runoff in 1964 the gates of Glen Canyon were ordered opened on March 26, 1964, by the Secretary to maintain elevation 1123 at Lake Mead, despite Upper Basin requests that water be retained in Lake Powell in order to start generation of energy by August 1, 1964.

However, 6 weeks after the gates were opened, on May 11, 1964, the Secretary announced the closure of the gates at Glen Canyon and the modification of the 1962 Filling Criteria to reduce by 40 feet, from elevation 1123 (rated power head) to elevation 1083 (minimum power pool), the water level below which Lake Mead would not be drawn. This was conditioned on the fact that, in addition to the allowance for deficiencies in firm energy pursuant to the 1962 Filling Criteria, the United States would replace impairments in Hoover Powerplant capacity and energy which result from lowering Lake Mead below elevation 1123 by reason of storage of water in Lake Powell, and would also relieve the allottees of the costs of extraordinary maintenance of the turbines and generators resulting from such lowering. These costs would be charged to the Upper Basin Fund but were *not* subject to reimbursement as was the case for deficiencies in firm energy as determined pursuant to the 1962 Filling Criteria.

Minimum power operating level (6.1 maf at elevation 3490) was achieved in Lake Powell on August 18, 1964. Energy generation began September 4, 1964. To obtain this minimum power pool at Glen Canyon Dam the flow at Lee Ferry was restricted to 2,520,000 acre-feet in water year 1963 and 2,427,000 acre-feet in water year 1964. Because of the tight water situation, Secretary Udall also directed Lower Basin water users, on May 16, 1964, to reduce their water demands by 10 percent for the period of July through December 1964. The Metropolitan Water District of Southern California was exempted from the 10 percent cutback. Also, a suit by the Yuma Valley water users to overturn the decision was unsuccessful.

The water surface elevation of Lake Mead dropped to a low of 1088.1 in December 1964, but was restored to rated power head elevation of 1123 on June 23, 1965.

The Upper Basin has repeatedly sought termination of the Filling Criteria or relief from use of the Upper Colorado River Basin Fund for payment for energy deficiencies at Hoover Dam. This led to Section 502 of the Colorado River Basin Project Act which provides for reimbursement to the Upper Basin Fund for monies used therefrom and replaced Additional Regulation No. 1.

During discussions on the formulation of the Operating Criteria, Upper Basin efforts to terminate the Filling Criteria were unsuccessful, as were other attempts in 1975 and 1978.

The Filling Criteria are elaborated on in Chapter VI.

M. The Colorado River Basin Project Act - Public Law 90-537

This Act was signed September 30, 1968, 82 Stat. 885, and was the result of many years of negotiation and compromise between California, the other Colorado River Basin States, the Columbia River Basin States, the Federal Government, and conservation groups and others.

Immediately after the Supreme Court Opinion in *Arizona* v. *California* on June 3, 1963, and even before the Decree issued March 9, 1964, the Senate Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs met to consider S.1658, introduced by Senators Hayden and Goldwater of Arizona on June 4, 1963, to authorize the Central Arizona Project (CAP). Arizona's need for the project was based on the claim that Arizona's economy was threatened unless additional water was available to it and that ground-water pumping of 3.5 maf far exceeded the annual recharge of 1.0 maf.

The hearings proceeded over the protests of California's Senator Kuchel that Interior had not yet reported on the pending legislation as required by law and that Secretary Udall had just completed his Basin-wide proposal, the Pacific Southwest Water Plan, of which CAP was a part. California also was seeking a rehearing in *Arizona* v. *California*. Senator Kuchel also stressed the need to give existing California water uses a priority over CAP similar to that recognized by Arizona for existing Arizona water uses, and the need for augmenting the river.

Several different versions of legislation were considered over the next several Congresses, ranging from a bare bones CAP, a Lower Colorado River Basin Project, to a Basin-wide project. The various versions revolved around inclusion of Bridge Canyon and Marble Canyon Dams as a source of power to pump CAP water and to aid CAP financially, both of which were strenuously opposed by environmental groups, the adequacy of the water supplies and its availability for additional projects, and the need for the extent of (2.5 to 8 maf) augmentation of the river which was opposed by the Columbia River Basin States because this Basin was a possible source of augmentation. In addition, the question of a priority for California's 4.4 maf and the length of such priority were key issues. It was suggested that such a priority would give California the victory it was denied in *Arizona* v. *California*.

In the back of the debates were studies by Arizona of the possibility that Arizona would finance and build CAP with its own funds—a "go it alone" concept that had enormous potential impacts on all future Reclamation projects. Other Upper and Lower Basin differences revolved around the rate of development in the Upper Basin, the use of Upper Colorado River Basin Fund revenues to purchase power to meet Hoover Powerplant deficiencies, the continuation of the Filling Criteria, the inclusion of Gila River flows as part of the water supply available to satisfy the Mexican Water Treaty, and whether the Mexican Treaty burden should be made a national obligation, and the Upper Basin's desire to protect their water supplies for later use against the temporary use in the Lower Basin.

An interesting fact in the evolution of CAP is that municipal and industrial water use planned from the project was only 1 percent of the total in the 1947 plan, but increased to 33 percent in 1963 and an even higher percentage in 1968.

The Colorado River Basin Project bill was enacted and became law on September 30, 1968, as Public Law 90-537, 82 Stat. 885. CAP was finally enacted after decades of controversy.

The background of the Colorado River Basin Project Act is elaborated on in Chapter XII.

Major features of the Act are as follows:

(1) It directed the Secretary to conduct reconnaissance investigations in order to develop a general plan to meet future water needs of the Western States and to make a final reconnaissance report in 1977 (see Chapter XII, Part H.9.1, for reports thereunder). It provided, however, that for a period of 10 years the Secretary shall not undertake reconnaissance studies of any plan for the importation of water into the Colorado River Basin from any other natural river drainage basin lying outside the States of Arizona, California, Colorado, New Mexico, and those portions of Nevada, Utah, and Wyoming which are in the natural drainage basin of the Colorado River (Section 201). This 10-year period was extended an additional 10 years by the Act of November 2, 1978, Public Law 95-578. Thus, the Pacific Northwest States protected their water sources.

(2) Title II declared that the satisfaction of the Mexican Water Treaty from the Colorado River constitutes a national obligation which shall be the first obligation of any water augmentation project planned pursuant to the Act and authorized by Congress. However, the Basin States are not relieved of this obligation until such time as an augmentation plan is developed and in operation to bring 2.5 maf to the river (Section 202). This was premised on the argument that the water for Mexico was originally assumed to be satisfied from "surplus" waters but that assumption was later negated by a decrease in Basin water supplies below that assumed during Colorado River Compact negotiations, therefore, Mexico's water really came from water needed by the Basin States. Thus, the Basin States should not be penalized by the Treaty obligation which should be a national responsibility.

(3) It authorized the Central Arizona Project (Section 301(a)), reauthorized the Dixie Project in Utah (Section 307), and conditionally authorized five Upper Basin projects (Section 501). Specific conditions were stipulated for the delivery of water to the Central Arizona Project (Section 304).

For example, expansion of irrigation on non-Indian lands was to be prohibited; canals were to be lined to prevent excessive conveyance losses; ground-water pumping controlled; and local water exchanged for mainstream supply.

(4) In the event of a water shortage, California's 4.4 maf/yr has priority over the Central Arizona Project (Section 301(b)). This achieved California's long sought objective and modified the administration of Article II(B)(3) of the Supreme Court Decree in *Arizona* v. *California*.

(5) It authorized the Secretary to enter into an agreement with non-Federal interests to construct a thermal generating powerplant whereby the United States shall acquire the right to such portions of that capacity as the Secretary determines is required in connection with the operation of the Central Arizona Project (Section 303). This was done by the United States participation and acquisition of a 24.3 percent share in the Navajo Generating Station near Page, Arizona.

(6) Title IV established the Lower Colorado River Basin Development Fund and provided for the allocation and repayment of the costs of the authorized projects. Costs incurred to replenish the depletion of the Colorado River flows available for use in the United States occasioned by compliance with the Mexican Water Treaty are to be nonreimbursable (Section 401).

(7) It provided for reimbursement of the Upper Colorado River Basin Fund from the Colorado River Development Fund for money expended heretofore or hereafter to meet deficiencies in generation at Hoover Dam during the filling period of storage units of the Colorado River Storage Project pursuant to the criteria for the filling of Glen Canyon Reservoir. It provided for the transfer of $500,000 for each year of operation of Hoover Dam and Powerplant, commencing with fiscal year 1970, to the Upper Colorado River Basin Fund from the Colorado River Development Fund until reimbursement is accomplished. The amount of any deficiency remaining as of June 1, 1987, shall then be transferred to the Upper Colorado River Basin Fund from the Lower Colorado River Basin Development Fund (Section 502).

(8) It required that, in the storage and release of water and in the operation of Federal reservoirs, the Secretary and Federal officials comply with the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, the Mexican Water Treaty, the Decree of the Supreme Court in *Arizona* v. *California*, and the Colorado River Storage Project Act. In the event of failure to so comply any affected State may sue, and consent was given to the joinder of the United States as a party. The Secretary is directed to report to the President, the Congress, and to the Basin States on the annual consumptive uses and losses of water from the Colorado River System after each successive 5-year period. All contracts for the delivery of water from Federal reservoirs are conditioned upon the availability of water under the Colorado River Compact (Section 601).

(9) It directed the Secretary to propose criteria for the coordinated long-range operations of Federal reservoirs, and provided that the criteria make provisions for the storage of water in storage units of the Colorado River Storage Project and releases of water from Lake Powell in a stated order of priority: (1) the Treaty obligation to Mexico, chargeable to the States of the Upper Division, if any exists; (2) the Upper Basin guarantee of 75 maf every 10 years to the Lower Basin; and (3) carryover storage to meet these obligations were to be given preference. Parity in storage between Lake Mead and Lake Powell was also provided. Following the adoption of the criteria, the Secretary is to report on the actual operation for the preceding compact water year and the project operation for the current year (Section 602).

The criteria were adopted by the Secretary on June 8, 1970.

(10) It reaffirmed the rights of the Upper Basin to the consumptive use of water from the Colorado River System available to that Basin under the Compact and provided that such rights shall not be reduced or prejudiced by any use of such water in the Lower Basin. Further, that the Act shall not be construed to impair the duties and powers of the Upper Colorado River Commission (Section 603).

(11) It defined terms such as "active storage" and "augmentation" (Section 606).

Further details regarding the Colorado River Basin Project Act are contained in Chapter XII hereof.

N. Operating Criteria

Section 602(a) of the Colorado River Basin Project Act of September 30, 1968, 82 Stat. 885, directed the Secretary of the Interior to "propose criteria for the coordinated long-range operation of the reservoirs constructed and operated under the authority of the Colorado River Storage Project Act, the Boulder Canyon Project Act, and the Boulder Canyon Project Adjustment Act..." and to receive comments from the States.

The need for the criteria was the concern of the Upper Basin States as to their ability to recapture from a new project in the Lower Basin presently unused water apportioned to the Upper Basin when needed for their own development. As a result of negotiations the Basin Project Act contained a list of priorities to govern the storage of water in storage units of the Storage Project and releases of water from Lake Powell. The Act also provided that the Upper Basin's rights to the consumptive use of water apportioned to that Basin by the Colorado River Compact would not be prejudiced or reduced by any use thereof in the Lower Basin.

In other words, storage in Lake Powell is the cornerstone of the Upper Basin's ability to deliver water to the Lower Basin to fulfill the requirements of Articles III(c) and (d) of the Compact and, at the same time, permit Upper Basin consumptive uses. Article III(c) deals with deliveries to Mexico and III(d) deals with deliveries of 75 maf to the Lower Basin each 10 years.

The criteria were to be prepared and reviewed each year after an exchange of views with the States and affected parties. The objective of the legislative requirements for the criteria was more efficient and reasonable river management. At the same time augmentation was emphasized in an effort to minimize the controversy over the Upper Basin's share of contribution to Mexico and whether the Gila River flows are accountable therefor. An example was the requirement that the first priority for the release of water from Lake Powell is to satisfy one-half of the deficiency in deliveries of water to Mexico, if any such deficiency exists and is chargeable to the States of the Upper Basin, but that the priority shall not apply in any year that the river is augmented sufficiently to satisfy the Treaty requirements and associated losses.

Among other major issues involved in the discussions over the crtieria were: Lake Powell bank storage; estimates of Upper and Lower Basin depletions; the use and magnitude of a specific figure for releases from Lake Powell (e.g., 8.23 maf); continuation of the Filling Criteria; and the use of a rule curve to accumulate storage in the Upper Basin reservoirs.

On June 8, 1970, after evaluation of the comments of the Upper and Lower Basin States, Secretary Hickel adopted the Operating Criteria. A letter of June 9, 1970, from the Commissioner of Reclamation explained the rationale of the decisions on these comments.

The Secretary concluded that the Filling Criteria would be continued, that energy needed to replace Hoover Dam deficiencies would be purchased, that the Upper Colorado River Basin Fund will be reimbursed pursuant to Section 502 of the Basin Project Act for monies used therefrom to purchase energy, except that the costs incurred in connection with impairment of capacity and energy resulting from the drawdown of Lake Mead below elevation 1123 feet incident to the attainment of minimum power pool in Lake Powell would not be repaid.

The criteria for coordinated long-range operation of Colorado River reservoirs, approved June 8, 1970, include the following provisions:

The Secretary may modify them from time to time and will sponsor a formal review at least every 5 years with the States participation.

The Secretary shall transmit to Congress and the Basin States Governors an annual report, starting January 1, 1972, and each January 1 thereafter, describing actual operations for the preceding compact water year and the projected plan of operation for the current year (Article I(1)).

The plan of operation shall include a determination by the Secretary of the quantity of water considered necessary to be in storage as of September 30 of that year as required by Section 602(a) of Public Law 90-537 ("602(a) Storage"). The factors to be considered in arriving at that determination are listed; e.g., historic streamflow, the most critical periods of record, and probabilities of water supply, estimated storage depletions in the Upper Basin, including the effects of recurrence of critical periods of water supply, the report of the committee on probabilities and test studies dated October 30, 1967, and the necessity to assure that Upper Basin consumptive uses not be impaired because of failure to store sufficient water to assure delivery under Section 602(A)(1) and (2), Public Law 90-537 (Article II(1)).

If, in the plan of operation, either

(a) the Upper Basin storage reservoirs active storage forecast for September 30 of the current year is less than the quantity of Section 602(a) storage determined for that date, or

(b) the Lake Powell active storage forecast for that date is less than the Lake Mead active storage forecast for that date, the objective shall be to maintain a minimum release from Lake Powell of 8.23 maf for that year (Article II(2)).

But if the Upper Basin storage reservoirs active storage forecast for September 30 of the current water year is greater than the quantity of 602(a) storage, water shall be released annually from Lake Powell at a rate greater than 8.23 maf to accomplish the following objectives:

(a) To the extent it can be reasonably applied in the Lower Division States, but no such release shall be made when the active storage in Lake Powell is less than the active storage in Lake Mead;

(b) To maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell; and

(c) To avoid anticipated spills from Lake Powell (Article II(3)).

In the application of Article II(3) the objective will be to pass the releases through Glen Canyon Powerplant as soon as practicable, utilizing the available capability of the powerplant, in order to equalize the active storage in Lake Powell and Lake Mead (Article II(4)).

Releases from Lake Powell pursuant to the criteria shall not prejudice either Basin's interests with respect to required deliveries at Lee Ferry pursuant to the Compact (Article II(5)).

Lake Mead is to be operated to meet Mexican Treaty obligations, reasonable consumptive use requirements of mainstream users in the Lower Basin, net river and net reservoir losses, and regulatory waste (Article III(1)).

Until Central Arizona Project water deliveries are made, Lower Basin reasonable consumptive use requirements will be met (Article III(2)). Thereafter, the consumptive use requirements will be met in light of the following situations: normal (7.5 maf); surplus (i.e., quantities greater than normal); and shortage (i.e., insufficient water to satisfy 7.5 maf annual consumptive use requirements) (Article III(5)). The criteria specified the relevant factors to consider in connection with "surplus" and "shortages."

Definitions are contained in Article IV.

In the actual operations under the Operating Criteria the annual reports have avoided the determination of the numerical value for Section 602(a) storage by stating that "the accumulation of 602(a) storage is not the criteria governing the release of water during the current year."

In 1975 the first formal 5-year review of the criteria was made, but after receipt of comments, the Secretary announced their continuation without change.

The Operating Criteria are elaborated on in Chapter VII.

O. Mexican Salinity Problems

No problems arose with regard to water deliveries to Mexico between 1945 and 1961 since the salinity of the waters delivered at the Northerly Boundary was generally within 100 parts per million (p/m) of the water at Imperial Dam, the last major diversion point for users in the United States.

In 1961 two unrelated events occurred which affected the salinity of the Mexican water deliveries. First, the Wellton-Mohawk Irrigation and Drainage District (part of Gila Project authorized in 1947 and whose construction was completed in 1952) commenced operation of a system of drainage wells which discharged saline waters with approximately 6,000 p/m into the Colorado River below Imperial Dam but above the Mexican diversion point.

Second, there was a sizable reduction in river flows to Mexico in 1961 because of increased storage in Lake Mead in anticipation of the closure of the gates at Glen Canyon Dam in the Upper Basin in order to store water in Lake Powell. This increased the salinity of the water delivered to Mexico from an average of 800 p/m in 1960 to nearly 1,400 p/m in 1961 and to 1,500 p/m in 1962. The daily salinity readings at times exceeded 2,000 p/m..

In November 1961 Mexico strongly objected to the salinity of the Colorado River waters received by it and negotiations between the two governments took place to resolve the matter. The negotiations resulted in Minute No. 218.

O.1 Minute No. 218

On March 22, 1965, a 5-year agreement, designated Minute No. 218, was concluded on practical measures to reduce the salinity of waters reaching Mexico, with each side reserving its legal rights. Under it the United States took the following actions at a cost to it of $12 million:

(1) Construction and operation of an extension to the existing Wellton-Mohawk drain so that the Wellton-Mohawk drainage water could either be bypassed at Morelos Dam or, at Mexico's option, received above Morelos Dam where it would be mingled with other Colorado River waters delivered to Mexico.

(2) Construction of additional drainage wells in the Wellton-Mohawk Division which allowed selective pumping of the most saline drainage waters at times when Mexico would be bypassing Wellton-Mohawk drainage waters; i.e., during the winter months, and allowed the pumping of higher quality ground water at times when Mexico would be using Wellton-Mohawk water.

(3) Replacement of a portion of the bypassed Wellton-Mohawk drainage waters—which resulted in the release of approximately 40,000 acre-feet per year of "stored water" from Imperial Dam in excess of the 1.5 maf per year guaranteed by the Treaty.

Under the above measures taken by the United States, the quality of the water delivered to Mexico was improved from about an average of 1,500 p/m in 1962 to 1,240 p/m in 1971.

Minute No. 218 was to expire in November 1970, and provided for consideration of a new Minute after the review of the conditions which gave rise to the problems. However, the Mexican officials did not want to enter into a long-term agreement in November 1970 since a new administration was assuming power in Mexico in December 1970. Minute No. 218 therefor was extended for a 1-year period.

Negotiations commenced in 1971 with the new Echeverria administration. The United States, supported by the Committee of Fourteen, proposed a new Minute which would have provided Colorado River water to Mexico having the same salt concentration as would exist were the Wellton-Mohawk Division, and all other projects in the United States below the Imperial Dam, in salt balance; i.e., that the tonnage of salt in drainage waters delivered to Mexico would not exceed the tonnage of the salt in the water applied to these lands below

the Imperial Dam in the United States, which contribute to the drainage waters. Under this proposal average salinity would have been reduced to about 1,130 p/m in 1973.

Mexico rejected this proposal because of the difference in quality between Colorado River water delivered to the United States water users at Imperial Dam and the quality of the waters delivered to Mexico. In the interim, Minute No. 218 was again continued.

O.2 Minute No. 241

Following meetings on June 15 and 16, 1972, between Presidents Nixon and Echeverria, Minute No. 241 of the International Boundary and Water Commission, dated July 14, 1972, replaced Minute No. 218.

Minute No. 241 provided that the United States would discharge Wellton-Mohawk water below Morelos Dam at the annual rate of 118,000 acre-feet per year (amounting to 73,000 acre-feet during the balance of 1972). In place thereof the United States would substitute an equal quantity of other waters, or an additional 41,000 acre-feet of water released from above Imperial Dam and 32,000 acre-feet of water pumped from 12 wells on the Yuma Mesa. The result was that the total deliveries exceeded the 1.5 million acre-feet per year guaranteed by the Treaty since the bypassed Wellton-Mohawk drainage waters were not counted as part of the Treaty water. This process reduced the average annual salinity of water delivered to Mexico from 1,242 p/m in 1971 to 1,141 p/m for the year ending June 30, 1972.

Under Minute No. 241 Mexico further requested that the United States discharge the balance of Wellton-Mohawk drainage water (approximately 95,000 acre-feet) below Morelos Dam, for which no substitution of fresh water was to be made, and which was charged to Mexico's 1.5 maf deliveries. This resulted in a further decrease of the average salinity from 1,140 p/m to 980 p/m for the year ending June 30, 1973, which was about 130 p/m higher than the average salinity of water arriving at Imperial Dam for a similar period.

O.3 Minute No. 242

As promised in the June 1972 meetings by President Nixon, on August 16, 1972, he appointed Mr. Brownell as his special representative and later as a Special Ambassador and Minute No. 242, dated August 30, 1973, evolved.

Its principal provisions were: the United States would adopt measures to assure that Mexico received water with an average salinity of no more than 115 p/m, plus or minus 30 p/m, over the annual average salinity at Imperial Dam;

the United States would bypass Wellton-Mohawk drainage water at the annual rate of 118,000 acre-feet per year without charge against Mexico's Treaty allotment, and substitute therefor an equal volume of other waters to be discharged to the Colorado River above Morelos Dam;

the United States will continue to deliver approximately 140,000 acre-feet per year on the land boundary at San Luis Mexico, in partial satisfaction of the Treaty obligation;

the existing Wellton-Mohawk drain would be extended approximately 53 miles to the Santa Clara Slough on the Gulf of Mexico at United States expense;

ground-water pumping within 5 miles of the Arizona-Sonora boundary would be limited by each country to 160,000 acre-feet per year;

the United States would support Mexican efforts to finance improvement of the Mexicali Valley; and

the new Minute is the permanent and definitive solution to the salinity problem.

The Mexican salinity problems are elaborated on in Chapter XIII.

P. The Colorado River Basin Salinity Control Act

The measures to be taken by the United States pursuant to Minute No. 242 included construction of a major desalting plant near Yuma, Arizona, to treat the bulk of the Wellton-Mohawk drainage water; lining or construction of a new lined Coachella Canal in California to salvage approximately 132,000 acre-feet of water annually; reduction of the irrigable acreage in Wellton-Mohawk from 75,000 to 65,000 irrigable acres and improved efficiency in the District; and construction of a well field along the southern border of the

United States similar to that constructed by Mexico on its side of the border. All of these measures are in progress as a result of the enactment of the Colorado River Basin Salinity Control Act, signed by the President on June 24, 1974, 88 Stat. 266. In addition, the Act made replacement of the reject stream from the desalting plant a national obligation (approximately 40,000 acre-feet per year) similar to the national obligation to satisfy the Mexican Treaty obligation in the Colorado River Basin Project Act. A key provision is the right of the United States to use water salvaged by the Coachella Canal lining during an interim period until California's water deliveries are reduced. This would compensate for the overdeliveries to Mexico caused by the bypass of drainage waters.

Although the Administration had preferred a bill to deal only with the Mexican salinity problem, the Congress, at the urging of the Basin States, authorized salinity control programs upstream from Imperial Dam.

These comprised the Paradox Valley Unit and the Grand Valley Unit, both in Colorado; the Crystal Geyser Unit in Utah; and the Las Vegas Wash Unit in Nevada. Planning reports were to be expedited for four irrigation source control units, three point source control units, and five diffuse source control units.

A Colorado River Basin Salinity Control Advisory Council was created by the Act which would receive, as would the President and Congress, the biennial reports from the Secretary on the progress of the salinity control program. The Council would review and comment thereon and make recommendations to the Secretary and the Environmental Protection Agency.

P.1 Operations Pursuant to Minute No. 242 During 1977

The IBWC report on operations under Minute No. 242 showed delivery to Mexico of 1,478,823 acre-feet with an average salinity of 943 p/m for 1977. During 1977 the average salinity differential between Morelos and Imperial Dam was 123 p/m, in accord with Minute No. 242.

During 1977, 206,822 acre-feet of Wellton-Mohawk drainage water were discharged below Morelos Dam and other waters were substituted in making deliveries to Mexico.

Also during 1977, 93,259 acre-feet of water were delivered across the land boundary at San Luis, Sonora, Mexico. This is less than 140,000 acre-feet delivered in prior years and referred to in Minute No. 242.

Mexico pumped 129,636 acre-feet during 1977 from its well field within 5 miles of the International Boundary, a quantity less than the 160,000 acre-feet limit provided in Minute No. 242

The Colorado River Basin Salinity Control Act is elaborated on in Chapter XIV.

CHAPTER II

UNITED STATES COLORADO RIVER WATER DELIVERY AND RELATED CONTRACTS

A. Background

The United States, acting through the Secretary of the Interior, has entered into Colorado River water delivery contracts under authority of the Boulder Canyon Project Act of December 21, 1928, 45 Stat. 1057. Section 5 authorizes such contracts and prohibits the use of stored water by anyone except by such contract. Prior to that, contracts were made under the Reclamation Act of 1902; water deliveries were made to lands in reclamation projects, such as the Yuma Project in Arizona and California, pursuant to water right applications filed by individual landowners; and diversions were permitted from such facilities (Laguna Dam); e.g., to lands in the North Gila Valley (Section 13(a) of the Project Act also approved the 1922 Colorado River Compact).

Contracts have been entered into with the State of Nevada, through its Colorado River Commission, dated March 30, 1942, 11r-1399, for the delivery of not to exceed 100,000 acre-feet of water per year for consumptive use (Article 5(a)). A charge of 50 cents per acre-foot is made during the Boulder Dam cost repayment period and, thereafter, the charge is to be on such basis as may be prescribed by Congress (Article 9). On January 3, 1944, a supplemental contract was executed in which the 100,000 acre-feet was raised to 300,000 acre-feet.

A contract has also been entered into with the State of Arizona dated February 9, 1944, for the delivery of a maximum of 2.8 maf/yr plus one-half of the excess or surplus water unapportioned by the Compact, to the extent it is available for use in Arizona under the Compact, and also subject to the right of Nevada to contract for 1/25th of any excess or surplus waters. Article 7(1) recognizes the Secretary's authority to contract with users in Arizona and provides that consumptive uses in Arizona are a discharge pro tanto of the obligation of the Arizona contract. A charge of 50 cents per acre-foot is made for diversions directly from Lake Mead during the Boulder Dam cost repayment period and a charge of not more than 25 cents per acre-foot is specified for diversions below Boulder Dam.

Unlike the situation in Arizona and Nevada where the Secretary entered into water delivery contracts with the States, there is no similar contract with the State of California. Rather, there are individual contracts with the five major Colorado River water using agencies in that State. Similarly, except for approximately 100,000 acre-feet of water which Arizona wants reserved for additional municipal and industrial uses along the river, the Secretary has entered into water delivery contracts with individual water using agencies in Arizona and Nevada for quantities which have fully utilized those apportioned to each of those States by the Supreme Court in *Arizona* v. *California*.

B. California Water Delivery Contracts

The background of the water delivery contracts executed by the Secretary following passage of the Boulder Canyon Project Act of December 21, 1928, 45 Stat. 1057, has been described in "The Hoover Dam Documents, Wilbur and Ely, 1948," at pages 101-114.

B.1. Seven-Party Priority Agreement

In California, their execution followed the California Seven-Party Agreement of August 18, 1931, and the Department of Interior's general regulations of September 28, 1931. Each of the current California contracts recites the complete list of the quantities and priorities set forth in the California Seven-Party Agreement of August 18, 1931, rather than a specific quantity of water allocated only to the individual contractor. In brief, these quantities and priorities are as follows:

Priority	Description	Acre-Feet Annually
1	Palo Verde Irrigation District gross area of 104,500 acres	
2	Yuma Project Reservation Division - not exceeding a gross area of 25,000 acres	Priorities 1, 2, and 3 shall not exceed
3(a)	Imperial Irrigation District and lands in Imperial and Coachella Valleys to be served by AAC	3,850,000
3(b)	Palo Verde Irrigation District - on 16,000 acres of mesa lands	
4	Metropolitan Water District, and/or City of Los Angeles, and/or others on the coastal plain	550,000
5(a)	Metropolitan Water District, and/or City of Los Angeles, and/or others on the coastal plain	550,000
5(b)	City and/or county of San Diego	112,000
	(5(a) and 5(b) are equal in priority)	
6(a)	Imperial Irrigation District and other lands in Imperial and Coachella Valleys served from AAC	
6(b)	Palo Verde Irrigation District - on 16,000 acres of mesa lands	300,000
	(6(a) and 6(b) are equal in priority)	
	Total	5,362,000

The California contracts are between the United States and:

B.2 The Metropolitan Water District of Southern California

April 24, 1930, No. I1r-645, providing for delivery of 1,050,000 acre-feet per year of water immediately below Boulder Canyon Dam. This contract was executed before the Seven-Party Agreement. Article 10 provides for a charge of 25 cents per acre-foot for water delivered to the District during the Boulder Dam cost repayment period. A similar charge appears in the San Diego contract of February 15, 1933, but does not appear in the California agricultural use contracts.

September 28, 1931, I1r-645, supplemented and amended the above agreement by incorporating Article I of the Seven-Party Agreement which, among other things, increased the quantity of Colorado River water to be delivered to MWD by the United States from 1,050,000 acre-feet per year to 1,100,000 acre-feet per year.

February 10, 1933, providing for construction of Parker Dam with MWD funds in the amount of 13,170,437 to provide a forebay for the MWD Colorado River Aqueduct and division of power produced therefrom with one-half to the United States and one-half reserved to MWD. The dam was completed September 1, 1938; the first power was generated December 13, 1942.

October 4, 1946, No. I1r-1483 (and with the City of San Diego and the San Diego County Water Authority) merging the city of San Diego's rights to 112,000 acre-feet of Colorado River water with MWD rights.

March 14, 1947, (between MWD and City of San Diego) transferring the city of San Diego's water rights to MWD.

B.3. City of San Diego

February 15, 1933, No. I1r-713, providing for delivery of Colorado River water to the city immediately above Imperial Dam in accordance with the priority provisions for the Seven-Party Agreement.

October 2, 1934, No. I1r-1151, providing 155 cubic feet per second (ft^3/s) of capacity for the city in Imperial Dam and in the All-American Canal. The construction obligation of $465,642.68 was repayable in 38 years. The initial payment date was March 1, 1955. As of September 30, 1977, $228,165 were repaid.

October 17, 1945, NOY 13300 (with the Navy Department), providing for an aqueduct to San Diego County from MWD aqueduct. Of the original repayment obligation of $13,972,099, $13,750,000 was repaid as of September 30, 1977.

September 23, 1946, NOY 13300, Supplement No. 1, making San Diego County Water Authority the assignee in part of the city's rights.

October 29, 1946, NOY 13300, Supplement No. 2, reserving title to part of the works in MWD.

December 11, 1947, NOY 13300, Supplement No. 3, providing interim use by Authority of the aqueduct.

April 1, 1952, NOY 13300, Supplement No. 4, providing for the addition of the second barrel to the aqueduct to San Diego County. Of the original repayment obligation of $30,090,216, $23,235,094 was repaid as of September 30, 1977.

B.4. Imperial Irrigation District

October 23, 1918, providing for the survey and construction of Laguna Dam (see Yuma Project, herein) and diversion of all water needed by the District and a main canal within the United States to transport such water. The District assumed and paid the $1.6 million costs of Laguna Dam for the right to use the Dam. On October 15 and October 2, 1934, the Coachella Valley County Water District and the City of San Diego, respectively, assumed a portion of the costs.

December 1, 1932, No. I1r-747, for construction of Imperial Dam, the All-American Canal (AAC), and for the delivery of water. It terminated the contract of October 23, 1918, except for the repayment provisions. The construction charge obligation was $25,020,000.90 repayable in 40 annual payments of a graduated basis, commencing March 1, 1955. As of September 30, 1977, $12,259,000 was repaid.

February 14, 1934 (Agreement of Compromise between Imperial Irrigation District and Coachella Valley County Water District), which subordinated Coachella's rights to Colorado River water to Imperial Irrigation District, providing for Coachella's leasing its AAC power privileges to Imperial, and dismissal of challenge to Imperial's action to validate its water delivery contract.

March 4, 1952, advising District of completion of construction of works provided for by the December 1, 1932, contract, transfer of O&M of completed works to District except Laguna Dam, the California Sluiceway and the overflow section of Imperial Dam, the headworks at the east end of the Dam, the turnout structures in the Imperial Dam—Pilot Knob section of the All-American Canal for water service to Siphon Drop Powerplant and to the Yuma Project Main Canal and the lands in the Yuma Project in California; providing for scheduling of water deliveries; the organization of the Imperial Dam Advisory Board; and giving permission to the District to develop the power possibilities on the AAC near Pilot Knob. (The District has constructed Drops 2, 3, and 4 on the AAC, with capacities of 10,000 kW, 4,800 kW, and 19,600 kW, respectively.)

March 27, 1978, for relinquishment of capacity in the Coachella Canal and adjustment of the District's repayment obligation pursuant to Sections 102(c) and (d) of the Colorado River Basin Salinity Control Act, dated June 24, 1974, 88 Stat. 266.

On March 27, 1978, the United States and the District entered into an amendatory repayment contract under which, as authorized in Section 102(d) of the Colorado River Basin Salinity Control Act, dated June 24, 1974, 88 Stat. 266, the District would be given a credit against its final payments for outstanding construction charges payable to the United States on account of capacity it would relinquish in the Coachella Canal as a part of the construction of a new 49-mile long, concrete-lined section of the Coachella Canal.

B.5. Palo Verde Irrigation District

February 7, 1933, providing for delivery of water in accordance with the Seven-Party Agreement.

On October 15, 1955, pursuant to the Act of August 31, 1954, 68 Stat. 1045, the United States and PVID executed a contract for the construction of a new diversion dam for the District at a cost of not to exceed $4,538,000, a loan of $500,000 to PVID for modification of the District's existing works to accommodate them to the dam, repayment of $1,175,000 within 50 years, with the balance of the costs of the works declared nonreimbursable, and no admission of liability on the part of the United States. An additional $2 million were apportioned under said Act for protection of Indian lands. The need for the dam arose following construction of Headgate Rock Dam in 1942, the degradation of the riverbed and a drop in the level of the river so that the District had to install pumps to irrigate its higher lands. A rock weir provided only temporary relief. As of September 30, 1977, $480,000 had been repaid.

A Memorandum of Agreement between the Bureau of Reclamation and the Bureau of Indian Affairs, dated February 16, 1956, provided for the construction of levees and a drain to protect the Colorado River Indian Reservation lands after removal of the rock weir referred to above and constructed to aid in irrigation of PVID lands. The Memorandum of Agreement was anticipated in the Act of August 31, 1954, which required the aforesaid contract of October 15, 1955, between the United States and PVID.

B.6. Coachella Valley County Water District

October 15, 1934, Contract No. I1r-781, providing for construction of 1,500 ft^3/s of capacity in Imperial Dam and the All-American Canal for the District and the delivery of water to the District in accordance with the priorities in the Seven-Party Agreement. The construction obligation of $13,458,562.03 was repayable in 40 annual, graduated installments. The first payment date was March 1, 1955. As of September 30, 1977, $6,594,695 were repaid.

December 22, 1947, supplemental contract providing for construction of a distribution system for the District and for protective works costing $18 million of which $4.5 million was allocated to flood control and declared nonrepayable; with repayable costs allocated for repayment by irrigation blocks over a 40-year period following an 8-year development period for each block; making excess land laws applicable to the District; and providing for approval of the contract by the electorate and validation of the contract by the State courts.

December 27, 1955, contract supplemental to contract of October 15, 1934, which provides that the District may hold to maturity certain United States savings bonds purchased by power rentals received for power rights and privileges of All-American Canal, at which time the proceeds therefrom are to be paid to the United States for deposit in the Colorado River Dam Fund, and applied against the installment payments to become due under the 1934 contract.

July 30, 1963, No. 14-06-300-1384, providing for rehabilitation and betterment of irrigation works by the District at a cost of not to exceed $7,150,000 with funds advanced by the United States and repayable in 30 annual installments starting 1966. As of September 30, 1977, $2,410,706 were repaid.

December 28, 1966, amendatory rehabilitation and betterment contract, providing for repayment in 28 years, starting 1966, or, if the work is not completed by June 30, 1967, providing for repayment in 25 equal annual payments starting December 1969.

March 14, 1978, providing for construction of and repayment for a new concrete-lined 49-mile section of the Coachella Canal and the use by the United States of the water salvaged thereby during an interim period, pursuant to Sections 102(a) and (b) of the Colorado River Basin Salinity Control Act, dated June 24, 1974, 88 Stat. 266.

B.7 Reservation Division, Yuma Project, California

The approximately 15,000 acres therein, one-half of which are Yuma Indian Reservation lands, are served water pursuant to individual water right applications (and not a District contract) and have essentially repaid the construction costs of $1 million assigned to them. Delivery of water to these lands is made pursuant to individual water right applications for the Bard or non-Indian Unit, and with the Bureau of Indian Affairs for the Indian Unit of the Yuma Project. Article II(d)(3) of the Decree in *Arizona* v. *California* dated March 9, 1964, also provides a reserved right for the Yuma Indian Reservation as of January 9, 1894.

The Bard Water District, comprising approximately 7,000 acres of non-Indian lands, has been formed. On December 1, 1978, the District entered into a contract with the United States whereby the District would collect O&M charges from the holders of water right contracts and make a single payment to the United States annually for the non-Indian portion. The District has indicated it would like (1) a rehabilitation and betterment contract to line the major canals, and (2) to take over O&M of the works. The latter has been difficult because the Indians have indicated a preference for the United States to do that work.

B.8 Special Water Delivery Contracts Involving The Metropolitan Water District

A special temporary emergency 5-year contract dated June 14, 1972, No. 14-06,300-2346, pursuant to Minute No. 240, dated June 13, 1972, of the International Boundary and Water Commission, between the United States, MWD, Otay Municipal Water District, City of San Diego, and San Diego County Water Authority, provides for the delivery of not more than 20,600 acre-feet per year through MWD aqueducts to the San Diego County Water Authority and ultimately to the City of Tijuana. The water delivery is charged to the deliveries under the Mexican Water Treaty of 1944.

On June 28, 1974, an amendatory contract was executed pursuant to Minute No. 245, dated May 15, 1974, whereby Yuma County Water Users' Association was provided with energy from Mexico to pump the water for the emergency deliveries and Reclamation provided a like amount of energy to the California entities for use in delivering the water.

On October 1, 1976, Amendment No. 1 to the Supplemental Agreement was executed, which provided for the delivery of treated water to Mexico and for increased payments therefor.

Because of delays in Mexico's construction of a permanent conveyance channel to replace the temporary emergency deliveries to Tijuana, a 1-year extension of the existing contract No. 14-06-300-2346 until August 13, 1978, was executed in the form of Amendment and Supplement No. 2, dated June 29, 1977.

B.8.1 Water Exchange Agreements With Coachella Valley County Water District and Desert Water Agency

On January 17, 1967, and October 13, 1967, MWD executed water exchange agreements with Desert Water Agency (DWA) and Coachella Valley County Water District (CVCWD), respectively. Each agreement was amended March 4, 1972. DWA and CVCWD had contracted for water deliveries from the California State Water Project of 38,100 acre-feet and 23,100 acre-feet, respectively. However, in order to postpone construction of costly facilities to transport the State Project water to them, these agencies wished to make their State Water Project water available to MWD, which, in turn, would make equivalent quantities of Colorado River water available to these two agencies from its Colorado River Aqueduct.

MWD's water delivery contract with the Secretary, as noted above, incorporated the provisions of the California Seven-Party Agreement, as did all the other current California water delivery contracts. This limited MWD's use of water to the coastal plain of southern California, whereas the point at which the two

agencies would receive and use the Colorado River water was outside the coastal plain. Hence, the consent of the Secretary and the other California Colorado River water contractors was needed to this change of place of use by MWD. The two agreements evidencing this consent were executed by appropriate parties to the California Seven-Party Agreement and the Secretary of the Interior on December 1, 1972, on the basis that there would be no additional demand on the Colorado River.

B.8.2 Southern California Edison Company - San Diego Gas and Electric Company

The DWA and CVCWD consent agreements were the first time the use of MWD's Colorado River water entitlement outside the coastal plain of southern California was approved and became the basis for a later proposal involving MWD water deliveries for a nuclear powerplant planned by Southern California Edison Company (SCE) on the Mohave Desert near Vidal, California. These, together with the exchange principle established thereby, were the bases for a similar proposal by San Diego Gas and Electric Company (SDG&E) for a nuclear powerplant near Blythe California.

MWD has conditionally agreed to make not more than 100,000 acre-feet of water available annually for nuclear plants on the Mohave Desert out of its Colorado River entitlement (see General Manager's memorandum of March 9, 1973, to the MWD Board of Directors). MWD's reasons were that MWD would provide the needed water for the nuclear plants if they were located on the coastal plain and that the power produced therefrom would be used within MWD's service area.

A draft consent agreement designated "Revised March 1, 1974 (Field Solicitor, Riverside)" was patterned after the MWD exchanges with DWA and CVCWD. Under it SCE would utilize up to 40,000 acre-feet per year of MWD entitlement of Colorado River water out of the MWD aqueduct for use outside the coastal plain, but this agreement has been held in abeyance, apparently waiting the outcome of the SDG&E proposal next discussed.

The SDG&E proposal to construct a nuclear generating station near Blythe, California, in which the City of Los Angeles, Department of Water and Power, and the California Department of Water Resources would join, involves the use of 17,000 acre-feet of drainage water per year diverted by SDG&E from the Palo Verde Lagoon or Outfall Drain. In exchange, MWD would reduce the quantity of water it would otherwise divert from Lake Havasu by an equivalent amount and thereby replace the drain water with Colorado River water diverted by SDG&E. The process would reduce the salinity of the water in the river (which is ultimately delivered to users in the United States and Mexico) by 3 to 4 parts per million.

In addition to the foregoing diversion of 17,000 acre-feet of drain water, SDG&E has purchased approximately 7,300 acres of irrigated lands within the Palo Verde Irrigation District (PVID) and plans to utilize at its proposed nuclear plant approximately 33,300 acre-feet of the water which otherwise would have been applied to irrigate those lands; i.e., the number of acres of SDG&E land within the District irrigated by Colorado River water would be reduced proportionately. This would reduce PVID's diversions by 33,300 acre-feet annually and its consumptive use by 17,000 acre-feet annually in order to allow the quantity of water otherwise consumptively used to be diverted for use at the nuclear plant.

However, that additional 33,300 acre-feet of water would also be diverted from the Palo Verde Outfall Drain except that, upon a finding by the Secretary as to its unavailability from the Drain, direct diversions from the Colorado River would be permitted during the period of unavailability. This additional use of the Outfall Drain water would further reduce the salinity of the Colorado River flows for downstream users and at Imperial Dam.

Two agreements designated "Revised Field Solicitor 11/1/74" and reflecting the aforesaid arrangements between SDG&E, the United States and the parties to the California Seven-Party Agreement (except the County of San Diego and the City of Los Angeles) were executed December 10, 1976. Under each agreement the Secretary reserved the right to confirm or withdraw therefrom on the basis of his evaluation of the Environmental Impact Statements to be prepared later in accordance with the National Environmental Policy Act.

The two latter agreements would represent the first use in the Lower Basin of the so-called "brackish water"; i.e., having approximately 1,800 p/m, for use in a generating station. The SDG&E agreement

would also be the first time irrigation water, forming a portion of an irrigation district's entitlement, would be used for nonirrigation purposes and the quantity of irrigated land thereby reduced.

The necessary State and Federal approvals of construction of the nuclear plant had not been obtained at the end of 1978.

B.9 Article V Reports under Decree in Arizona v. California and Return Flow Credits

As "watermaster" of the Colorado River pursuant to the Supreme Court Decree in *Arizona* v. *California*, it is the responsibility of the Secretary of the Interior, through the Bureau of Reclamation, to keep records of all users of Colorado River water in Arizona, Nevada, and California.

In compliance with Article V of the Decree an annual report is prepared by the Bureau showing total Colorado River water released through regulatory structures controlled by the United States, diversions, return flow of such water, and consumptive use of such water stated for each diverter, and each of the States of Arizona, California and Nevada. This is done for each user agency having contracts with the United States as well as those who do not. This includes both surface diversions and returns as well as ground-water pumping. Pumping from the underground is included only for those wells located in the flood plain of the Colorado River between the toes of the slopes on either side of the Valley. It may become necessary in the future to include also those wells outside of the flood plain which, as a result of pumping, reverse the slope of the water table so that water flows from the river to the wells. The Annual Report for calendar year 1977 appears as Appendix 201.

There are also undetermined amounts of unmeasured return flow reaching the Colorado River by means of underground flow from aquifers underlying water use areas. A task force on ground-water return flows to the lower Colorado River, consisting of State and Federal members, was organized in 1970 to provide advice and guidance to the Bureau of Reclamation and to the Geological Survey which are jointly conducting a program to determine the location and amounts of these unmeasured return flows. When such quantities are determined, it is anticipated that these amounts will be credited to the affected users and States in making the consumptive use computations.

B.10 California Water Use

In 1975, 1976, and 1977, the major California water contractors consumptively used the following quantities of Colorado River water:

	1975	1976	1977
Metropolitan Water District	778,495	790,857	1,276,891 acre-feet
Palo Verde Irrigation District	449,486	392,220	435,062 acre-feet
Reservation Division - Indian Unit	42,449	43,941	34,151 acre-feet
Reservation Division - Non-Indian Unit	46,903	49,958	43,854 acre-feet
Imperial Irrigation District	3,070,974	2,876,984	2,772,062 acre-feet
Coachella Valley County Water District	570,987	524,801	508,635 acre-feet

The total water use for the above and all other users during 1975, 1976, and 1977 was:

1975	*1976*	*1977*	
5,496,007	5,242,324	5,626,818	acre-feet of diversions
512,302	535,730	514,140	acre-feet of measured return flows
4,983,705	4,706,594	5,112,678	acre-feet of consumptive use

Thus, except for "surplus water, all of California's apportionment of Colorado River water is presently utilized.

B.11 California Miscellaneous Contracts

The United States has entered into various loan contracts under authority of the Small Reclamation Projects Act of 1956, dated August 6, 1956, 70 Stat. 1044, as amended September 2, 1966, 80 Stat. 376. These are not water delivery contracts, but are loans to provide improvements to water distribution systems. Included are contracts with:

Eastern Municipal Water District, No. 14-06-300-1169, dated May 2, 1961, amended July 31, 1961, and May 24, 1965. As of September 30, 1977, $809,574 was repaid of $4,971,983 loan;

West San Bernardino Water District, No. 14-06-300-1977, dated September 12, 1967, amended September 21, 1971. Of the $3,519,292 loan $90,255 was repaid as of September 30, 1977;

Valley Center Municipal Water District, No. 14-06-300-2152, dated January 30, 1970. The amount advanced was $7,240,000; and

De Luz Heights Municipal Water District, No. 7-07-30-W0005, dated September 29, 1977. The maximum amount of the loan is $5,402,783.

C. Arizona Water Delivery Contracts

Prior to the passage of the Boulder Canyon Project Act in 1928 water deliveries were made under the Reclamation Act of 1902. It was not until February 9, 1944, that the Secretary contracted with Arizona for the delivery of 2.8 maf annually to users in Arizona who contract with the Secretary. The deliveries were all subject to the availability of water under the Project Act and the Compact.

C.1 Yuma Project - Valley Division

The Yuma Project, one of the earliest Reclamation projects, comprising approximately 68,000 acres, was initially authorized by the Secretary of the Interior on May 10, 1904, in accordance with Section 4 of the Reclamation Act of 1902, 32 Stat. 388. It consists of the Reservation Division in California, which, in turn, is divided into the Yuma Indian Reservation portion of 7,743 acres and a non-Indian or Bard Unit of approximately 6,700 acres; the Valley Division in Arizona of 50,000 acres; and the Yuma Auxiliary Division of 3,300 acres on the mesa between the Valley Division and the Yuma Mesa Irrigation and Drainage District in the Gila Project.

Colorado River water for the Yuma Project was initially diverted at Laguna Dam which was constructed in 1909 under authority of the Act of April 21, 1904, 33 Stat. 189. The water was carried on the California side from Laguna Dam to Siphon Drop, a small powerplant built in 1926 at the head of the Yuma Main Canal but now inoperative, and delivered to Reservation Division lands in California. Other waters were carried through the Yuma Main Canal and under the Colorado River by means of an inverted siphon for use on Yuma Project lands in Arizona. Initial water deliveries were made pursuant to individual water right applications, a procedure which preceded the Bureau of Reclamation's contracting process with a District or similar water agency.

With the construction of Imperial Dam (immediately north of Laguna Dam) and the All-American Canal pursuant to the Boulder Canyon Project Act of December 21, 1928, diversions at Laguna Dam for the Yuma Project ceased and diversions were begun at Imperial Dam in 1941. The All-American Canal contract with Imperial Irrigation District requires the District to provide and for the AAC contractors to pay for an additional 2,000 acre-feet of capacity in the Canal without cost to the Yuma Project for the purpose of making water deliveries to the Yuma Project.

The United States Department of the Interior has a series of contracts with the Valley Division of the Yuma Project represented by the Yuma County Water Users' Association:

Contract dated May 31, 1906, No. I1r-635, whereby Association guaranteed payment for construction of works of the Valley Division, and was supplemented by contract dated February 5, 1931, whereby

Association assumed the obligation under individual water right applications. Repayment period extended to 30 years.

Contract No. 176r-671, dated June 15, 1951, dealt with transfer of operation and maintenance to Association, and repayment of $80,306 of costs of drainage.

Repayment contract, No. 14-06-300-621, dated April 1, 1957, whereby Association was released from its obligation under individual water right applications and assumed a fixed repayment obligation.

Contract No. 14-06-300-1317, dated November 15, 1962, providing for transfer of O&M of additional project works, including Yuma Main Canal and Siphon Drop Powerplant.

Contract No. 14-06-300-1513, dated December 17, 1967, for conditional transfer to the Association of the reserve funds for Siphon Drop Powerplant.

Contract No. 14-06-300-1850, dated June 22, 1966, for the construction, operation and maintenance of a series of drainage wells in the Valley Division.

Contract No. 14-06-300-2702, dated November 12, 1969, relative to the delivery of water.

Contract No. 14-06-300-2204, dated October 21, 1970, for the modification of structures.

Additional contracts were entered into by the United States and the Yuma County Water Users' Association with Imperial Irrigation District: Contract No. 14-06-300-1381, dated June 1, 1963, Amendment No. 1 dated June 1, 1965, and Amendment No. 2 dated June 1, 1967, providing for the transfer of water from Siphon Drop Powerplant to the District's Pilot Knob Powerplant for the purpose of producing energy at the more efficient powerplant and for a division among the parties of the power and energy thereby produced. (Siphon Drop Powerplant, at the head of the Yuma Main Canal, about 5 miles north of Yuma, not inoperative, had a nameplate capacity of 1,600 kW, and a maximum head of 15.3 feet. Pilot Knob has a capacity of 33,000 kW.) The contract of June 1, 1967, extended the period for transfer of water for 61 months, or until June 30, 1972. On that date Amendment No. 3 extended the period for 5 years, or until June 30, 1977. Amendment No. 4 of that date provided for subsequent renewals by letter agreements.

C.1.1 Valley Division's Water Use

The obligation of the United States to deliver water to Valley Division lands is not couched in terms of a specific quantity of water but is stated as the quantity reasonably required for the irrigation of the lands in the Division.

In 1975, 1976, and 1977, the Association consumptively used 232,601, 212,741, and 188,854 acre-feet of water, respectively; i.e., diversions less measured returns.

C.2 Gila Project - Reauthorization Act

In 1934 the Bureau of Reclamation reported on the Gila Project potentials following investigations it had been authorized to undertake by the Boulder Canyon Project Act of December 21, 1928. The Yuma Mesa Division of the Gila Project, comprising 150,000 acres, was authorized under a finding of feasibility approved by the President on June 21, 1937, in accordance with Section 4 of the Act of June 25, 1910, 36 Stat. 835, and Section 4(b) of the Act of December 5, 1924, 43 Stat. 701.

Original plans contemplated Colorado River water diversions to irrigate a total of 585,000 acres. In order to make a proposal of that size possible the Gila headworks at Imperial Dam were constructed with three sets of outlet units, each with three radial gates capable of diverting 6,000 ft^3/s. Only one outlet unit is now used.

Gila Project construction began in 1936 on the Yuma Mesa but was retarded during World War II. However, the establishment of the Yuma Army Air Field on the Yuma Mesa called for dust control measures, and public land predevelopment on approximately 20,000 acres on the Yuma Mesa Division was continued to provide the necessary relief. Water was first available in 1943. Canal and lateral construction was speeded up as hostilities ended.

In 1947 Congress enacted the above entitled legislation reauthorizing the Gila Project and redefining its boundaries (the text appears in Appendix 202). The Yuma Mesa Division was reduced (from its initial proposed size of 150,000 acres) to 40,000 acres (15,000 acres in the North and South Gila Valleys and 25,000 acres in the Yuma Mesa Unit) and the Wellton-Mohawk Division of 75,000 acres was substituted for the Yuma Mesa Division lands excluded from the original authorization.

The Act referred to the reduced project of 40,000 acres and to authorization of the Wellton-Mohawk Division of 75,000 acres in identical terms:

"... or such number of acres as can be adequately irrigated by the beneficial consumptive use of not more than 300,000 acre-feet of water per annum diverted from the Colorado River..."

The Arizona Water Commission interprets the above phrase "consumptive use" in accordance with the definition in Article I(A) of the Decree in *Arizona* v. *California* as diversions less return flows. However, the Wellton-Mohawk Irrigation and Drainage District interprets the phrase as meaning the quantity of water used for the growing of crops; e.g., under the Blaney-Criddle formula, and that return flow is not relevant to its entitlement.

It should be noted that the Colorado River Basin Salinity Control Act, discussed separately herein, reduced the Wellton-Mohawk's irrigable acreage from 75,000 acres to 65,000 acres and to even a lesser number, with the District's approval, if necessary to reduce the return flows from the District to approximately 175,000 acre-feet per year.

C.2.1 Gila Gravity Main Canal Capacity

Water for the Gila Project is diverted from the Colorado River at the Arizona or east end of Imperial Dam, 18 miles northeast of Yuma. Imperial Dam was authorized by the Boulder Canyon Project Act of 1928. Its construction began in 1936 and was completed in July 1938. Water is delivered for project lands via the 20.7-mile long Gila Gravity Main Canal which has a capacity of 2,200 (ft^3/s). That capacity has been contracted for as follows:

Wellton-Mohawk Irrigation District	-	1,300 ft^3/s
North Gila Valley Irrigation District	-	150 ft^3/s
Yuma Irrigation District	-	130 ft^3/s
Yuma Mesa Irrigation and Drainage District	-	520 ft^3/s
Unit B (Yuma Auxiliary Project-Yuma Project)	-	100 ft^3/s
		2,200 ft^3/s

C.3 Wellton-Mohawk Division, Gila Project, Arizona

Construction of features of the 75,000 acre-Wellton-Mohawk Division began in August 1949 and was essentially completed June 30, 1957. However, water was first delivered to project lands on May 1, 1952.

Negotiations on a construction, water delivery and repayment contract between the United States and the Wellton-Mohawk Irrigation and Drainage District concluded with execution of a contract, No. I1r-1591, on March 4, 1952. It provided for the delivery to or for the District at Imperial Dam of Colorado River water from storage in Lake Mead, at a maximum rate of delivery of 1,300 ft^3/s, as may be reasonably required and beneficially used for the irrigation of not to exceed 75,000 irrigable acres situate within the District. The oibligation to deliver water was subject to its availability for use in Arizona under the provisions of the Colorado River Compact and the Boulder Canyon Project Act and was also subject to the Mexican Water Treaty of 1944. Each of Interior's water delivery contracts is required by Reclamation law to include this type of qualification. The entitlement of the District, in effect, is related to and limited by the 1,300 ft^3/s of capacity available to the District out of the 2,200 ft^3/s capacity of the Gila Gravity Main Canal.

The contract provided for the expenditure of $38.6 million for the construction of three main canals within the District, pumping plants, a distribution system, protective works, and minimum drainage works. Irrigation blocks were provided for (i.e., a block of lands capable of receiving water service at substantially the same time), as was transfer to the District of operation and maintenance of completed works, repayment in 60 years of not in excess of $42 million following a 10-year development period for each irrigation block (which included a proportionate share of O&M costs, and costs of Imperial Dam abutment and headworks, the desilting works, and the Gila Gravity Main Canal). A reserve fund was established, records provided for, acreage limitation provisions (excess land laws) were included as were incremental value provisions. The contract required validation in the Arizona courts.

The basic 1952 contract was supplemented and amended as conditions and later events required. These later contracts were entered into on the following dates and for the following principal purposes:

June 19, 1954	-	covered supply and cost to District of power and energy needs in the event of disposition by the United States of Parker-Davis or Gila Substation
October 13, 1954	-	termination of incremental value provisions in March 4, 1952, contract.
December 16, 1954	-	revision of repayment and irrigation block provisions.
April 25, 1955	-	transmission service to be provided by District to serve relift pumps.
December 9, 1955	-	assumption by District of operation of Wellton-Mohawk Canal; revision of repayment provisions dealing with transfer of O&M, and irrigation blocks and advance of O&M funds.
September 1, 1959	-	construction of added drainage works at a cost of $14 million to be allocated among irrigation blocks, and initial payment due 12-31-73, and increased repayment obligation of District from $42 million to $56 million.
March 4, 1962	-	provided for deferment, consolidation and rescheduling of construction and drainage charge repayment obligation of $56 million as an obligation of District as a whole rather than allocated among blocks, and adoption of a variable repayment plan. Repayment over a 55-year period began December 31, 1968.
July 1, 1962	-	supply of power to ditchriders' houses and relift pumps and installation of additional relift pump.
July 12, 1963	-	provided for District construction of additional power facilities and transmission of energy to pumps of United States.
September 25, 1964 No. 14-06-300-1491)	-	provided for installation and maintenance of meters on drainage wells of District and of United States.
August 2, 1965	-	provided for delivery by District of domestic water not in excess of 5,000 acre-feet annually.
August 15, 1968	-	provided for modification of existing four irrigation blocks, provision for an additional block 5, adjustment and rescheduling of repayment obligation of existing four blocks and deferring payments for 10 years for new block 5, use of national parity factor, and to allocate $5,915,268 to non-reimbursable flood control. (This reduced the contracted repayment obligation over a 55-year period to begin December 31, 1968, with block 5 lands to begin payment December 31, 1978.) Of the original payment obligation of $50,084,732, $2,122,098 were repaid as of September 30, 1977.

The number and complexity of the foregoing contracts led to the assignment to Mr. Milton N. Nathanson, Special Consultant to the Bureau of Reclamation, of the task of their consolidation. A consolidated draft relating to water deliveries and repayment has been prepared and is awaiting further action due to adjustment

of District's repayment obligation stemming from its reduced acreage pursuant to the Colorado River Basin Salinity Control Act. A separate draft relating to power matters has also been prepared.

C.3.1 Wellton-Mohawk's Water Use

The Wellton-Mohawk water delivery contract of March 4, 1952, I1r-1591, contains no specific reference to a quantity of water to be delivered. Instead, the United States agreed to deliver such quantities "as may be reasonably required and beneficially used for the irrigation of not to exceed 75,000 irrigable acres..." subject, among other things, to its availability under the Gila Reauthorization Act; e.g., the beneficial consumptive use of not more than 300,000 acre-feet of water per annum diverted from the river..." and at a maximum rate of diversion of 1,300 ft^3/s at Imperial Dam.

In 1975, 1976, and 1977, the District consumptively used 333,108, 286,175, and 240,208 acre-feet of water, respectively; i.e., diversions less return flows.

C.3.2 Drainage Contracts

In addition to the foregoing, other contracts were entered into between the District and the United States. These were:

February 2, 1959 (No. 14-06-300-902)	-	Construction by District of drainage facilities and minor construction works not to exceed $200,000 in costs. Ten supplemental contracts were entered into thereunder.
August 8, 1960 No. 14-06-300-1044)	-	Construction by District of drainage facilities not to exceed $750,000 in costs. Supplemental contracts were entered into thereunder.
August 14, 1963 (No. 14-06-300-1389)	-	Construction by District of drainage facilities not to exceed $1,125,000 and minor construction work not to exceed $500,000.
		Fifteen numbered, supplemental contracts and two unnumbered supplemental contracts were executed pursuant to the aforesaid drainage and minor construction contract dated August 14, 1963.
March 2, 1970 (No. 14-06-300-1389)	-	Construction by District with its own forces or by contract, or by United States, of drainage facilities not to exceed $1,250,000 and minor construction work not to exceed $500,000.

C.3.3 Miscellaneous Wellton-Mohawk Contracts

Boundary changes, such as the District's resolutions approving inclusion of lands within the District, which require Secretarial approval became effective dated: July 12, 1963; September 25, 1964; March 1, 1965; and July 15, 1967.

Cooperative Agreement with Soil Conservation District dated December 11, 1953.

Contract between the District and the Wellton Community Water Company dated January 18, 1966, whereby the District furnished water to the Company for resale by Company, was approved by the United States on February 25, 1966.

Contract No. 14-06-300-1572, for performance of services in connection with productivity reexamination of lands within the District, was executed March 1, 1965.

C.4 Yuma Mesa Division-Gila Project-Yuma Mesa Irrigation and Drainage District

The Gila Gravity Main Canal, 20.7 miles in length, originates at Imperial Dam and ends at the Yuma Mesa Pumping Plant. Water is then pumped 52 feet to the head of the mesa distribution system.

Delivery of water to lands on the Yuma Mesa was initiated prior to execution of a repayment contract with the Yuma Mesa Irrigation and Drainage District under authority of Section 7 of the Act of August 4, 1939, 53 Stat. 1187, since the majority of the lands involved were in public ownership. Of the 19,970 acres under the distribution system, 14,411 acres were in cultivation at the end of 1954; a majority of these lands were opened to homestead entry under Public Notice No. 4 on December 10, 1947, and Public Notice No. 9 on January 21, 1952.

A construction, water delivery and repayment contract (No. 14-06-W-102) was executed by the United States and the District on May 26, 1956, under authority of the Act of January 28, 1956, 70 Stat. 5. The contract provided for the delivery to or for the District of water diverted at Imperial Dam at a maximum rate of diversion at Imperial Dam of 520 ft^3/s, and delivered at Station 1099 + 56.99 on the Gila Gravity Main Canal; i.e., the Yuma Mesa Pumping Plant, in such quantities as may be reasonably required and beneficially used for the irrigation of not to exceed 25,000 irrigable acres. As was done in the foregoing Wellton-Mohawk contract, the obligation to deliver water was subject to its availability for the division under the provisions of the Colorado River Compact, the Boulder Canyon Project Act, the Gila Reauthorization Act, and the Mexican Water Treaty of 1944.

The contract provided for limited drainage works, transfer of operation and maintenance, repayment by the District of its share of the capital costs of constructed works and other costs totalling $5,641,167 over a 60-year period following a development period, the establishment of two irrigation blocks, and the allocation of costs thereto on the basis of land classifications, release of contracts and mortgages covering predevelopment charges, use of variable repayment formula, power and energy for Gila Project purposes, establishment of a reserve fund, maintenance of books and records, excess land provisions, and validation of the contract in the Arizona courts.

On January 1, 1959, the District assumed O&M of the irrigation works below the afterbay of the Yuma Mesa Pumping Plant. On January 1, 1961, the District took over O&M of the Pumping Plant.

A supplemental and amendatory contract with the District, dated February 26, 1969, provided for the irrigation of approximately 400 acres of lands in substitution for an equivalent number of acres of District lands which had been converted from agricultural to urban use, and for the District's assumption of its share of annual O&M costs of the drain from the Gila Gravity Main Canal to the Colorado River.

A second supplementary agreement, dated March 23, 1972, provided for studies for a regulating reservoir which the District did not pursue.

As of September 30, 1977, $759,085 had been repaid.

C.4.1 Yuma Mesa Irrigation and Drainage District Water Use

The Yuma Mesa water delivery contract of May 26, 1956, No. 14-06-W-102, contains no specific reference to the quantity of water to be delivered. Instead, the United States agreed to deliver such quantities as may be reasonably required and beneficially used for the irrigation of not to exceed 25,000 irrigable acres, subject, among other things, to its availability under the Gila Reauthorization Act; e.g., the beneficial consumptive use of not more than 300,000 acre-feet of water per annum diverted from the river for the Yuma Mesa Division (which includes the 15,000 acres in the North and South Gila Valleys in addition to the 25,000 acres of Yuma Mesa lands), and at a maximum rate of diversion of 520 ft^3/s at Imperial Dam.

In 1975, 1976, and 1977, the District consumptively used 226,665, 219,057, and 211,508 acre-feet of water, respectively; i.e., diversions less measured return flows. This included deliveries in 1975 of 2,323 acre-feet to 7 small contractors, of which the Marine Corps Air Station used 1,994 acre-feet. Similarly, in 1976 there were included deliveries of 2,088 acre-feet to the same small contractors, of which the Marine Corps Air Station used 1,871 acre-feet. In 1977 there were included deliveries of 2,267 acre-feet to these

small contractors of which the Marine Corps Air Station used 2,041 acre-feet. The Marine Corps Air Station was formerly the Yuma Army Air Field.

C.4.2 North Gila Valley

Upon completion of Laguna Dam, 10 miles northeast of Yuma, in 1909, the North Gila Valley Irrigation District diverted water therefrom. Under a contract with the United States dated September 24, 1918, the District assumed possession of the headgate, canal, levees and spur dike constructed to serve and protect its lands.

On May 12, 1953, the District entered into a contract with the United States, No. 14-06-W-54, under which the United States agreed to deliver water stored in Lake Mead to the District through diversions from Imperial Dam, thence through the Gila Gravity Main Canal, at or near Station 409 + 25, at a maximum rate of delivery of 100 ft^3/s, as may be reasonably required and beneficially used for the irrigation of the irrigable lands in the District. The obligation to deliver water was subject to the availability of such water for use in Arizona under the Colorado River Compact, the Boulder Canyon Project Act of December 21, 1928, 45 Stat. 1057, the Gila Reauthorization Act of July 30, 1947, 61 Stat. 628, and was also subject to the Mexican Water Treaty of 1944. The aforesaid contract of September 24, 1918, was terminated and the District assumed O&M of the works transferred to it under that contract and the obligation to pay the costs thereof within 60 years as well as the District's share of the O&M costs of the works utilized in making water available to the District; e.g., Imperial and Laguna Dams, the Gila Desilting Works, the Gila Gravity Main Canal and the North Gila Drains. The contract also provided for the maintenance of books and records, acreage limitation provisions, and for its validation in the Arizona State courts.

Since the Yuma Irrigation District, representing the South Gila Valley, was unwilling at that time to contract for delivery of water through the Gila Gravity Main Canal and preferred to continue its groundwater pumping, the United States was receptive to increasing the 100 ft^3/s capacity in the Gila Gravity Main Canal available to the North Gila Valley Irrigation District.

On June 24, 1954, the contract was amended (No. 14-06-W-66) to increase the maximum rate of delivery of water from 100 ft^3/s to 150 ft^3/s, to increase the repayment obligation from $325,000 to $475,000 and the annual O&M costs proportionately. This was further amended by Contract No. 14-06-300-1862 on August 9, 1966.

On October 26, 1964, the parties contracted (No. 14-06-300-1497) for the construction by the United States of a second turnout for the District at Station 595 + 48 on the Gila Gravity Main Canal with a design capacity of 45 ft^3/s.

A second amendatory contract, executed August 9, 1966, No. 14-06-300-1862, provided for delivery of water to the District at or near both of the aforesaid Stations with the understanding that such deliveries would not increase the quantity of water which the District is entitled to receive nor increase the maximum rate of delivery through the Gila Gravity Main Canal in excess of 150 ft^3/s.

The final repayment obligation of the District was established at $430,277, of which $169,491 was paid as of September 30, 1977, leaving $260,786 as the remaining obligation.

C.4.2.1 North Gila Valley Water Use

The North Gila Valley water delivery contract, dated May 12, 1953, No. 14-06-W-54, contains no specific reference to the quantity of water to be delivered. Instead, it has provisions relative to the quantity reasonably required and beneficially used, subject to the conditions similar to those for the Yuma Mesa District.

In 1975, 1976, and 1977, the District consumptively used 48,909, 44,599, and 42,153 acre-feet of water, respectively; i.e., diversions less measured return flows.

C.4.3 Yuma Irrigation District - South Gila Valley

The aforesaid contracts provided for utilization of the following portions of the 2,200 ft^3/s capacity of the Gila Project works, including the Gila Gravity Main Canal:

1. Wellton-Mohawk IDD	1,300 ft^3/s
2. North Gila Valley ID	150 ft^3/s
3. Yuma Mesa IDD	520 ft^3/s
4. Unit B *(see C.5 infra)*	100 ft^3/s
	2,070

Thus, only 130 ft^3/s capacity remained for the Gila Project's final water contracts.

The Yuma Irrigation District represented the landowners in the South Gila Valley which had been designated as a part of the 15,000 acres in the North and South Gila Valleys and part of the Yuma Mesa Division of the Gila Project by the Gila Reauthorization Act of July 30, 1947, 61 Stat. 528. Its water supply for the approximately 10,570 acres in the District was obtained by ground-water pumping but the water quality had been deteriorating while the District's drainage problems increased. The District then sought a Colorado River water delivery contract with the United States.

On July 23, 1962, the District executed a water delivery and repayment contract with the United States, No. 14-06-300-1270. Under this contract the United States agreed to construct a distribution system within the District to utilize Colorado River water and a system of District drainage tile collection lines, at a cost of approximately $6,377,000. Onfarm tile drains would be the responsibility of the farmers. Because of the 15,000 acre limitation on acreage in the combined North and South Gila Valleys as part of the Yuma Mesa Division and on the quantity of water available to the whole of the Yuma Mesa Division imposed by the Gila Reauthorization Act, only approximately 8,770 acres of District land could be irrigated with Colorado River water (15,000 acres minus 6,230 acres in North Gila Valley already under contract). Hence, the project plan called for the continued use of sufficient ground water (to be commingled with Colorado River water) to permit irrigation of all irrigable land in the District. As of September 30, 1977, $25,411 were repaid.

The contract provided that repayment of total costs of approximately $7.5 million would be made over a 60-year period. Irrigation blocks were to be created, O&M to be transferred, a reserve fund established, excess land laws enforced, and the contract to be authorized by the District's electorate and validated in the State courts.

On October 25, 1965, an amendatory repayment contract was executed under which drainage of the District's lands was to be accomplished by drainage wells rather than limited to the tile collection drains. Authorization by the electorate and Court validation was provided.

On March 17, 1964, Contract No. 14-06-300-1441 was executed providing for the District to transmit power and energy over its system to the eight pumping facilities constructed by the United States and to construct additions to its electric system as may be agreed upon.

On December 29, 1964, Contract No. 14-06-300-1506 was executed which provided for the District's construction of additional electrical facilities in order to provide transmission service to the relift pumping facilities of the United States.

On May 10, 1971, a second amendatory contract was executed under which the District could assume responsibility for payment of the charges established by the Secretary for the delivery of water rather than having such costs collected from individual farmers by the United States by means of water rental or toll charges during the development period or until transfer of O&M to the District. The amendatory contract was requested by the District in order to enable it to levy tolls against all irrigable lands, whether or not Colorado River water was used, so as to avoid an increasingly large deficit occasioned by the continued use of ground water by about 4,000 acres out of the District's 10,740 acres which did not pay water rental or toll charges.

On May 17, 1973, a third amendatory contract was executed which increased the Capital Payment Reserve Fund from $50,000 to $100,000.

C.4.3.1 Yuma Irrigation District Water Use

The South Gila Valley water delivery contract has provisions similar to the North Gila Valley contract with regard to the quantity of water to be delivered to it.

In 1975, 1976, and 1977, the District consumptively used 59,278, 59,660, and 60,460 acre-feet of Colorado River water respectively; i.e., diversions less measured return flows. It also used 13,369 and 13,029 acre-feet of pumped water in 1975 and 1976, respectively.

The foregoing completes the Gila Project water delivery and related contracts *(see C.5 infra)*.

C.5 Yuma Auxiliary Project (Unit B)

This project was initially authorized under the provisions of the Act of January 25, 1917, 39 Stat. 868, as a part of the Yuma Reclamation Project, and originally called for irrigation of 45,000 acres on the adjacent Yuma Mesa.

The Act of June 13, 1949, 63 Stat. 172, reduced the area of the Yuma Auxiliary Project to 3,305 acres by excluding certain described lands therefrom, allowed an exchange of water rights for the severed land to the lands in the reduced area, and authorized execution of a contract with an organization representing the water users in the Limited Project to permit delivery of water through works of the adjacent Gila Project rather than the Yuma Project; i.e., the B-Lift Pumping Plant which pumped water 72 feet to the Yuma Auxiliary Project lands from the East Main Canal of the Yuma Project's Valley Division in Arizona. The B-Lift Pumping Plant was then dismantled.

A further reduction in acreage was made by the Act of February 15, 1956, 70 Stat. 15.

On December 22, 1952, Contract No. 14-06-300-44 was executed by the Unit B Irrigation and Drainage District and the United States. It provided for the delivery of Colorado River water through the A8.9 lateral of the Gila Project (which served lands on the Yuma Mesa) for the irrigation of 3,305 acres of irrigable lands situate within the Unit B or Yuma Auxiliary Project covered by land and/or water right applications, subject to agreement that the capacity provided for the District in Imperial and Laguna Dams and in all Gila Project works utilized for the benefit of the District lands was 100 ft^3/s.

The contract further provided for construction of certain works and District assumption of their O&M, and for repayment of the costs of these works established at $965,873, including $456,090 for a share of Gila Project costs and $509,783 for extension and betterment of Yuma Auxiliary Project works, and a share of the O&M costs of Gila Project works utilized in delivering water to the District; i.e., the Gila Headworks of Imperial Dam, the Gila Gravity Main Canal, and the Yuma Mesa Pumping Plant. It also provided for establishment of a reserve fund, maintenance of books and records, applicability of excess land laws, and for validation of the contract in the State courts.

Water deliveries through Gila Project works began on July 6, 1953.

This contract was amended by the parties on July 18, 1956, to reflect the aforesaid reduction in acreage provided for by the Act of February 15, 1956.

Another supplemental and amendatory contract was executed by the parties on October 20, 1959. It provided for the District's assumption of O&M of the District's distribution system as of January 1, 1960, the District's payment of O&M costs of works common to the District and the Yuma Mesa Irrigation and Drainage District, and a review of those costs by the United States. As of September 30, 1977, $351,101 had been repaid.

On August 22, 1962, Contract No. 14-06-300-1274 was executed by the parties. It provided for the rehabilitation and betterment of certain project works by the District with funds advanced by the United States, and repayment of the costs thereof, not to exceed $450,000. The costs were later fixed at $335,764. This included installation of three irrigation wells which the District later decided not to construct for various reasons including the impact of the availability of the ground-water pumping on the District's Colorado River water delivery contract and other rights to Colorado River water; i.e., "present perfected rights." As of September 30, 1977, $135,000 had been repaid.

C.5.1 Yuma Auxiliary Project (Unit B) Water Use

The Unit B water delivery contract contains no specific reference to the quantity of water to be delivered to it. Instead, it has provisions similar to the Gila Project contracts with Yuma Mesa and the North and South Gila Valleys regarding the quantity of water and a limitation of not more than 100 ft^3/s in the capacity of the works used in delivering water.

In 1975, 1976, and 1977, the District consumptively used 37,436, 37,225, and 36,726 acre-feet of water, respectively; i.e., diversions less measured return flows. This included 893 acre-feet delivered to two small contractors in 1975, 949 acre-feet delivered in 1976, and 650 acre-feet in 1977.

C.6 Other Arizona Water Delivery Contracts

On November 14, 1968, Secretary of the Interior Udall signed the following water delivery contracts with:

Contractor	Contract Quantity of Water	Quantity of water used 1975	1976	1977
City of Kingman	not to exceed 18,500 a.f.	- 0 -	- 0 -	- 0 -
Mohave Valley IDD	not to exceed 51,000 a.f.	18,806 a.f.	14,598 a.f.	24,936 a.f.
Lake Havasu IDD	not to exceed 14,500 a.f.	7,267 a.f.	7,327 a.f.	7,524 a.f.
	not to exceed 84,000 a.f.			

The total of 84,000 acre-feet contracted for represents 3 percent of Arizona's 2.8 maf allotted to it in *Arizona* v. *California*. The Kingman and Lake Havasu contracts are for M&I use while the Mohave Valley contract is for both irrigation and domestic uses. The contracts impose a charge of 25 cents per acre-foot for domestic water. The city of Kingman has not yet begun diversions, primarily because of the costs of pumping; i.e., the city is about 2,650 feet above the maximum water surface elevation of Lake Mohave. Nor do the other two contractors; i.e., the Districts, which are adjacent to the Colorado River, directly divert surface water from the river, but their use of ground water is established by their contracts as use of Colorado River water.

Three other water delivery contracts have been executed. These are:

Contractor	No.	Date	Contract Quantity of Water
Lakeside Utilities	7-07-30-W0001	April 1, 1977	120 acre-feet
Holiday Harbor Utilities	7-07-30-W0003	June 16, 1977	200 acre-feet
Ehrenberg Improv. Assoc.	7-07-30-W0006	October 14, 1977	500 acre-feet

The City of Yuma has a water delivery contract, No. 14-06-W-106, dated November 12, 1959, which provides for the delivery of not more than 50,000 acre-feet per year of Colorado River water which is to be delivered immediately below Imperial Dam. Because of water delivery and salinity problems, the city executed an amendatory contract with the United States and the Yuma Valley County Water Users' Association on December 14, 1977, No. 14-06-W-106, to change the Imperial Dam point of delivery and to take delivery of water through the All-American-Canal, the Yuma Main Canal and the Valley Division's East Main Canal. The contract has the approval of the Imperial Irrigation District, which will carry the city's water through the All-American Canal. In 1975, 1976, and 1977, the city consumptively used 7,144, 6,782, and 8,212 acre-feet of water, respectively; i.e., diversions less measured return flows.

C.7 Miscellaneous Water and Related Contracts

There are 14 contracts entered into by the United States in the early 1950's under authority of the Warren Act (the Act of February 21, 1911, 35 Stat. 925), which are inactive but not yet terminated. They involve minor quantities of water and have a rate of $1.30 per acre-foot.

There are also nine miscellaneous purpose contracts in the Yuma area entered into in the 1950's and 1960's under authority of the Act of February 25, 1920, 41 Stat. 451. These, too, are for insubstantial quantities of water but as of January 1, 1977, had a rate of $15 per acre-foot.

The United States has also entered into various loan contracts under authority of the Small Reclamation Projects Act of 1956, dated August 6, 1956, 70 Stat. 1044, as amended September 2, 1966, 80 Stat. 376. Included are contracts with:

Roosevelt Irrigation District, No. 14-06-300-1323, dated December 26, 1962, amended June 19, 1972; loan of $3,954,396, of which $503,851 was repaid as of September 30, 1977.

Roosevelt Water Conservation District, No. 14-06-300-1724, dated November 26, 1972; loan of $4,833,481, of which $415,099 was repaid as of September 30, 1977.

Brown Canal Company, No. 14-06-300-1748, dated December 30, 1965; loan of $164,145, of which $29,136 was repaid as of September 30, 1977.

Graham Canal Company, No. 14-06-300-2314, dated April 3, 1972, for a loan of $1,417,400 and a joint grant with the Curtis Canal Company and the Carter Canal Company of $1,762,000 for construction of flood control facilities. The grant was increased to $4,453,666 by letter amendment dated October 20, 1977.

Curtis Canal Company, No. 14-06-300-2315, dated April 12, 1972, for a loan of $787,600 and a joint grant with the Graham Canal Company, of $1,762,000. The grant was increased to $4,453,666 by letter amendment dated October 20, 1977.

Gila River Farms, No. 7-07-30-W0002, dated June 3, 1977, for a loan of $9,950,000.

None of these loan contracts involves the use of Colorado River water.

C.7.1 Arizona's Colorado River Water Use

In calendar years 1975, 1976, and 1977, the major Arizona contractors and water users consumptively used the following quantities of Colorado River water:

	Acre-Feet		
	1975	*1976*	*1977*
Valley Division of Yuma Project	232,601	212,741	188,854
Wellton-Mohawk Division of Gila[1]	333,108	286,175	240,208
Yuma Mesa[2]	226,665	219,057	211,508
North Gila Valley	48,909	44,599	42,153
Yuma Irrigation District, South Gila			
River[2]	59,278	59,660	60,460
Wells[2]	13,368	13,029	15,707
Yuma Auxiliary Unit B[2]	37,436	37,225	36,726
Mohave Valley IDD	18,806	14,598	24,936
Lake Havasu IDD	7,267	7,327	7,524
City of Yuma	7,144	6,782	8,212
Colorado River Indian Reservation	339,023	330,870	595,165

[1]Consumptive use figures give credit for drainage returns.

[2]Figures represent diversion. Return flows from South Gila Valley and Yuma Mesa outlet drain not quantitatively assigned to these and to other districts. These returns totaled 111,436 acre-feet in 1975, and 102,821 acre-feet in 1976.

In calendar years 1975, 1976, and 1977 the total of all Colorado River water use in Arizona was:

1975	1976	1977	
2,128,213	1,968,848	1,917,981	af of diversions
770,210	720,828	686,707	af of measured return flows
1,358,003	1,248,020	1,231,274	af of consumptive use

out of the 2.8 million acre-feet apportioned to Arizona by the Supreme Court Decree in *Arizona* v. *California*. Arizona claims credit for unmeasured return flows to the river, as does California, but as noted in the comments under return flows in Chapter II, B.9, these quantities are not yet determined.

C.8 Central Arizona Project

The contract between the Secretary and the Central Arizona Water Conservation District, No. 14-06-W-245, dated December 15, 1972, provides for the construction of the Central Arizona Project (CAP) by the United States, the delivery of an average of 1.2 million acre-feet annually of Colorado River water to the Phoenix and Tucson areas, and the repayment of up to $1.2 billion of reimbursable costs. If the reimbursable costs exceed $1.2 billion, the contract must be renegotiated. The CAP background is covered elsewhere under the Colorado River Basin Project Act of September 30, 1968, which authorized construction of CAP. This contract, except for approximately 100,000 acre-feet of water which Arizona wants reserved for municipal and industrial uses along the river, in effect, commits all of Arizona's remaining entitlement of Colorado River water to CAP, which use, in turn, is subordinated to prior existing present perfected rights and contract users as provided in Section 301(b) of the Act.

The following table shows the quantities of water recommended by Arizona to be contracted for in three-party agreements for M&I use. In addition, similar agreements will be recommended for agricultural water.

ARIZONA WATER COMMISSION
RECOMMENDED ALLOCATION OF MUNICIPAL AND INDUSTRIAL WATER
FROM THE CENTRAL ARIZONA PROJECT

Applicant	1985	2034
Municipal and Domestic		
Arizona Water Company		
Apache Junction	1,700	4,300
Casa Grande	5,500	10,500
Coolidge	1,600	2,600
Miami-Claypool	1,900	2,400
White Tank	450	670
Avondale	690	2,000
Berneil Water Company	220	250
Buckeye	890	1,200
Camp Verde Water Company	100	550
Carefree Water Company	710	1,200
Chandler	0	2,600
Chandler Heights Citrus Irrigation District	110	250
Chapparal City Water Company		
Fountain Hills	1,000	3,900
Citizens Utility Company		
Rio Rico	0	160
Sun City	4,800	23,900
Clearwater Company	90	690

ARIZONA WATER COMMISSION
RECOMMENDED ALLOCATION OF MUNICIPAL AND INDUSTRIAL WATER
FROM THE CENTRAL ARIZONA PROJECT

Applicant	1985	2034
Consolidated Water Utility	2,000	12,600
Cottonwood Water Company	1,400	2,500
Cresent Valley Water Company	430	1,200
Desert Ranch Water Company	20	70
Desert Sage Water Company	450	6,000
Eloy	1,300	2,700
Florence	680	1,000
Florence Gardens	60	100
Gila Bend	480	550
Glendale[1]	4,800	12,700
Globe	2,000	2,900
Goodyear	540	740
Green Valley Community Water Company	580	2,600
Litchfield Park Service Company	1,600	5,900
Maricopa Mtn. Water Company	100	100
Mayer-Humboldt Water Company	110	280
McMicken Irrigation District	1,000	2,500
MCMWCD #1	160	710
Mesa	6,700	15,600
New Pueblo Construction Company		
Picacho Peak	60	80
Green Valley	80	160
Nogales	0	3,800
Paradise Valley Water Company	2,000	3,400
Tyson	720	2,700
Peoria[1]	-	-
Phoenix	56,000	102,000
Pine	220	590
Pinnacle Paradise Water Company	0	90
Prescott	3,200	3,500
Queen Creek Irrigation District	500	1,000
San Tan Irrigation District	70	70
Rio Verde Utilities Incorporated	260	980
Scottsdale	5,000	17,600
Sunrise Water Company	0	300
Tempe	0	3,400
Trails End Water Service	80	190
Tucson[2]	54,300	97,800
Turner Ranches	490	1,900
Westward Hills Water Company	180	470
Williams Air Force Base	1,200	920
Youngtown	560	420
Subtotal	169,090	369,290
Mines	110,000	0
Power	0	100,000

ARIZONA WATER COMMISSION
RECOMMENDED ALLOCATION OF MUNICIPAL AND INDUSTRIAL WATER
FROM THE CENTRAL ARIZONA PROJECT

Applicant	1985	2034
Recreation		
Arizona Game and Fish Department	755	415
Maricopa County Board of Supervisors	3,041	2,041
Contingencies		
Arizona State Land Department	200	37,500
Other		
Phoenix Memorial Park	90	250
Total	282,176	509,496

[1]2,500 acre-feet allocated to Glendale is tentative pending outcome of litigation between Glendale and Peoria of annexation of portion of McMicken Irrigation District service area.
[2]This recommendation assumes a major portion of sewage effluent from the city of Tucson will be made available to mines in area. If the transfer of effluent to the mines is not consummated and is retained instead within the city's water supply system, the city's allocation will be reduced and the mines' allocation increased by the amount of effluent retained.

The Secretary is expected to act on such recommendations after the M&I environmental assessment is completed, probably in mid to late 1979. The Arizona Water Commission is studying the agricultural water allocations which it will submit to the Secretary when completed.

Two subsidiary contracts were executed by the Department of Interior for special studies. These were Contract No. 14-06-300-2192, dated July 7, 1970, with the Arizona Interstate Stream Commission, and Contract No. 14-06-300-2408, dated November 10, 1972, with the Arizona Water Commission, successor to the Interstate Stream Commission.

D. Nevada Water Delivery Contracts

Following execution of the contracts with the State of Nevada, dated March 30, 1942, and January 3, 1944, providing for the consumptive use of 300,000 acre-feet of Colorado River water, the Secretary entered into the following water delivery contracts with water using entities in Nevada:

D.1 Boulder City

No. 14-06-300-978, dated January 4, 1960, pursuant to the Boulder City Act of 1958, approved September 2, 1958, 72 Stat. 1726, providing for a maximum delivery of 3,650 gallons per minute. Actual deliveries averaged 2,300 acre-feet during 1971-75. In 1976 Boulder City consumptively used 1,900 acre-feet diverted through its facilities and 2,053 acre-feet diverted through the Southern Nevada Water Project. In 1977, these diversions were 1,356 acre-feet and 2,545 acre-feet respectively.

The Boulder City Act of 1958 authorized transfer of the city from Federal control to the municipality incorporated under Nevada laws.

Contract No. 14-06-300-1459, dated April 2, 1964, with Boulder City provides for studies relating to the delivery of water to the city. The costs of the study amounted to $8,374 which was paid in full on May 5, 1967.

Contract No. 14-06-300-2084, dated March 3, 1969, provides for the construction of a new 10 million gallon storage tank, pump facilities and appurtenant pipelines to connect with the city's existing facilities at a cost of $629,000 repayable in 40 equal annual installments. As of September 30, 1977, $56,084 had been repaid.

D.2 Basic Management, Inc.

No. 14-06-300-2083, dated September 18, 1969, for a maximum diversion from Lake Mead of

41,277 acre-feet per year. During 1971-1975 diversions approached 20,000 acre-feet per year. In 1976 and 1977 it diverted 8,798 acre-feet and 7,353 acre-feet, respectively.

D.3. Las Vegas Valley Water District

No. 14-06-300-2130, dated September 22, 1969, for a maximum diversion of 15,407 acre-feet per year. Actual diversions were 6,120 acre-feet in 1971-72. Diversions were suspended thereafter because of deliveries through the Southern Nevada Water Project. In 1976 and 1977 those deliveries were 59,912 acre-feet and 61,573 acre-feet respectively.

D.4. Colorado River Commission of Nevada-Southern California Edison Company

No. 14-06-300-1877, dated October 26, 1966, for a maximum diversion of 30,000 acre-feet per year, of which less than one-half is actually diverted, for the Mohave Steamplant across from Bullhead City, Arizona. In 1976 and 1977, the diversions were 14,709 acre-feet and 14,327 acre-feet, respectively. This contract permits Southern California Edison Company to use part of Nevada's entitlement for 35 years, the expected life of the steamplant.

D.5. Southern Nevada Water Project

No. 14-06-300-1974, dated August 25, 1967. This contract provides for the First Stage of the project with a diversion capability of 138,000 acre-feet.

D.5.1 First Stage

Construction of the Southern Nevada Water Project was authorized by the Act of October 22, 1965, 79 Stat. 1068, to deliver water from Lake Mead for municipal and industrial uses in Clark County, Nevada. The Project was to be built in three stages. This was later changed to two stages because of burgeoning population growth and need for water. The principal First Stage features consist of intake facilities in Lake Mead, eight pumping plants, 4 miles of concrete-lined tunnels, 7 miles of main aqueduct, 37 miles of laterals, and regulating facilities. Water treatment is provided separately by Nevada's Alfred Merritt Smith Treatment Facility adjacent to Saddle Island.

The cost of construction of the First Stage, completed in July 1971, was $52,901,300, of which $1,737,000 is allocated to Nellis Air Force Base and is nonreimbursable. The balance, all allocated to municipal and industrial water supply, is repayable in 50 years with interest at the rate of 3¼ percent.

The following First Stage subcontracts were executed with Nevada's Colorado River Commission (later succeeded by the Division of Colorado River Resources) for deliveries of water with options for additional water under the Second Stage, as follows:

Subcontractor	Contract Executed	Acre-Feet of Diversions Stage 1	Stage 2*
Boulder City	8/25/67	7,000	15,000
Henderson	8/25/67	7,000	40,000
No. Las Vegas	8/25/67	20,000	40,000
Las Vegas Valley Water Dist.	8/25/67	99,200	200,000
Nellis Air Force Base (No. GS-00T-1710)	1/8/69 Rev. 2/19/75	4,000	7,000

*The Second Stage options were premised on assumptions that the return flow credits would be of a magnitude which would permit a "consumptive use" of not more than 300,000 acre-feet of water.

Pursuant to a contract dated August 1, 1971, with Nevada's Colorado River Commission, the Las Vegas Valley Water District assumed responsibility for the operation and maintenance of the project. This contract was approved by Nevada's Governor on September 21, 1971.

D.5.2. Second Stage

A contract for the construction of the second and final stage of the project, No. 7-07-30-W0004, was executed August 4, 1977, and superseded the First Stage contract of August 25, 1967. Deliveries of water under it at a maximum rate of diversion of 638 ft^3/s for both stages of the project with the exception of present perfected rights and miscellaneous contracts for delivery of water from Lake Mead and along the river will utilize all of Nevada's entitlement of 300,000 acre-feet per year of consumptive use; i.e., diversions less measured return flows.

The Second Stage will modify and expand the present system. It will add five new pumping plants, a second barrel to the main aqueduct and approximately 30 miles of additional pipeline and laterals. The costs are estimated at $109,864,000, and the State of Nevada has agreed to pay the construction costs in excess of available Federal funding of $88,377,000 in order to expedite construction and to avoid delay in obtaining authorization to increase the appropriation ceiling.

Revenue for repayment of the project's costs will be derived from the sale of project water under the subsidiary contracts. The First Stage reimbursable costs were allocated based on the water entitlement of each entity in proportion to the total First Stage water entitlement under contract. Under the Second Stage only Nellis Air Force Base uses that allocation procedure, while the remaining water users will each pay a share of the total annual reimbursable capital costs (with the capital costs allocated to Nellis excluded) based on its proportion of annual water use to the total annual water use (again excluding Nellis).

All users will pay OM&R costs in proportion to water user. If water use follows projections, the water rate for amortization of capital costs will approximate $45 per acre-foot over the 50-year repayment period. Amortization of facilities financed by State funding are projected at $40 per acre-foot. OM&R costs presently amount to $36 per acre-foot.

Each stage is allowed a 50-year repayment period with the First Stage repayment beginning in 1973 and the Second Stage expected to begin in 1983. In addition to amortization of the Federal obligation, the State will pay 50 cents per acre-foot of water diverted as provided in its contract of March 30, 1942. Following the Hoover Dam cost repayment period, the 50 cent charge will be adjusted as prescribed by Congress.

Upon completion of construction, it is anticipated that OM&R will be transferred to the Las Vegas Valley Water District as the agent of the State.

D.5.3 Second Stage Subcontracts

The aforesaid First Stage subcontracts were amended and superseded by the following Second Stage subcontracts:

Subcontractor	Contract Executed	Actual Acre-Feet of Diversions 1975	1976	1977
Boulder City	8/4/77	1,847	2,053	2,545
Henderson	8/4/77	1,558	1,901	2,195
No. Las Vegas	8/4/77	6,370	6,546	6,498
Las Vegas Valley Water District	8/4/77	55,135	59,912	61,573
Nellis Air Force Base	Execution pending as of 2/15/78	1,907	2,190	2,714

D.6. Miscellaneous Nevada Water Delivery Contracts

The United States, with the Colorado River Commission's concurrence, has entered into two miscellaneous contracts permitting diversions from Lake Mead. These are with:

Lakeview Company, No. 14-06-300-1523, dated February 12, 1965, providing for a maximum annual diversion of 120 acre-feet per year. No diversions have been made thereunder.

Johns-Manville Production Corporation, No. 14-06-300-1518, dated April 9, 1965, providing for a maximum annual diversion of 928 acre-feet per year. In 1975, 385 acre-feet were diverted and in 1976, 422 acre-feet.

In addition, six other contracts permit a total diversion of 458 acre-feet from the Colorado River below Davis Dam in Nevada, of which one contract is for 380 acre-feet.

The Interior Department's Bureau of Reclamation has entered into the following Memoranda of Understanding:

U.S. Bureau of Mines, No. 14-06-300-1215, dated June 1, 1961, providing for a maximum diversion of 175 gallons per minute, under which 21 acre-feet were delivered in 1975.

Nevada Park Service, No. 14-06-300-1212, dated June 1, 1961, providing for a maximum delivery of 80 gallons per minute, under which 8 acre-feet were delivered in 1975.

Nevada Fish and Game Department, No. 14-06-300-2405, dated October 18, 1972, under which 6 acre-feet were delivered in 1975.

D.7 Nevada Water Use

In 1975, 1976, and 1977, in addition to the aforementioned diversions by the Southern Nevada Water Project contractors, the major Nevada water contractors diverted the following quantities of Colorado River water:

	1975	1976	1977
Boulder City	1,983 acre-feet	1,900 acre-feet	1,356 acre-feet
Basic Management Inc.	11,923 acre-feet	8,798 acre-feet	7,353 acre-feet
Southern California Edison Company	14,422 acre-feet	14,709 acre-feet	14,327 acre-feet

Boulder City receives Colorado River water from the Southern Nevada Water Project facilities and from an older separate Federally constructed system. The figures in the above tabulation are from the latter.

The total water use for the above and all other contractors in 1975, 1976, and 1977, respectively, was:

1975	1976	1977	
105,054	108,362	109,434	acre-feet of diversions
32,914	35,170	36,260	acre-feet of measured return flows
72,140	73,192	73,174	acre-feet of consumptive use

out of the 300,000 acre-feet apportioned to Nevada by the Supreme Court Decree in *Arizona* v. *California.* (The measured return flow for 1975 includes 29,150 acre-feet of estimatred return flow in Las Vegas Wash and 31,357 acre-feet in 1976.)

D.8. Nevada's Use of Excess or Surplus Water

A contract has been drafted for Nevada's use of 1/25th of any excess or surplus water as provided in Article 7(f) of the Arizona water delivery contract of February 9, 1944, and Article II(B)(2) of the Decree of March

9, 1964, 376 U.S. 340, in *Arizona* v. *California*, but was not executed as of February 1978. (Article II(B)(2) of the Decree expresses the quantity as 4 percent of the surplus waters; i.e., mainstream water available to satisfy annual consumptive use in the Lower Basin States in excess of 7.5 maf.)

CHAPTER III

POWER CONTRACTS

A. Background

The Bureau of Reclamation of the Department of the Interior has statutory authority to operate major powerplants on the Colorado River and to utilize the power and energy produced therefrom for use by Reclamation and associated projects and to sell any available power and energy. In the sale preference is given to municipalities and public agencies.

A.1 Priorites in the Use of Hoover Dam

Section 6 of the Boulder Canyon Project Act, December 21, 1928, 45 Stat. 1057, 1061, provides:

> "The dam and reservoir provided for by section 1 hereof shall be used: First, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and satisfaction of present perfected rights in pursuance of Article VIII of said Colorado River compact; and third, for power..."

Article II (A) of the Decree in *Arizona* v. *California*, dated March 9, 1964, 376 U.S. 340, repeats these provisions. And, Articles III(a) and (b) of the operating criteria, approved June 8, 1970, provide, respectively, for releases from Lake Mead to meet the Mexican Treaty obligations and the reasonable consumptive use requirements of mainstream users in the Lower Basin.

Pursuant to the foregoing, releases from Lake Mead are made to meet the Mexican Treaty obligations and the consumptive use requirements of mainstream users and, in the process, to generate power. Conversely, at this time water is not released from Lake Mead solely for the purpose of producing power.

A.2 Sources of Federal Power and Energy

Federal power is available in the Lower Colorado River Basin from the following principal sources, each of which is separately discussed:

Boulder Canyon Project;
Parker-Davis Project;
Colorado River Storage Project; and
Navajo Project.

In addition, there is an extensive transmission system throughout most of the State of Arizona and the Pacific Northwest-Pacific Southwest Intertie which provides transmission service between the Phoenix area and southern Nevada.

A.3 Department of Energy

A new cabinet level United States Department of Energy (DOE) was created on October 1, 1977. This agency absorbed a portion of Interior's Bureau of Reclamation power and energy functions and led to a division of authority in the administration of Interior's power contracts. Reclamation essentially retained responsibility for operation of all the Colorado River dams, including all aspects of Hoover Dam. DOE's Western Area Power Administration (WAPA) assumed administration of Interior's power sales contract functions and the operation and maintenance of the transmission system, including switchyards.

A.4 Contracts Administered by DOE, Interior and Jointly

Lists of the power and power related contracts retained for administration by Interior, those assumed by WAPA, and the four minor power related agreements jointly administered by both Reclamation and WAPA, together with a capsule description of each agreement, respectively, appears herein as Appendix 301.

B. Boulder Canyon Project

B.1 Background

The Boulder Canyon Project was authorized by the Act of December 21, 1928 (45 Stat. 1057), subject to the terms of the Colorado River Compact. The Boulder Canyon Project Adjustment Act (54 Stat. 774), dated July 19, 1940, provided for certain changes in the original plan. The Act of June 29, 1948 (62 Stat. 1112), provided that certain investments and expenditures not related to the construction, operation, or maintenance of the project be removed from the repayable costs of the project.

The project was constructed for the purposes of controlling the floods, improving navigation, regulating the flow of the Colorado River, providing for storage and for the delivery of the stored waters thereof for reclamation of public lands and other beneficial uses exclusively within the United States, and for the generation of electrical energy. The main features of the project include the dam and reservoir, hydroelectric plant with 1,344,800 kW capacity, and high voltage switchyards. Electrical energy is delivered to the allottees at the high voltage switchyards and transmitted from that point to loads in Arizona, California, and Nevada over facilities which are owned or arranged for by the allottees of electrical energy. The investment of the United States in Hoover Dam and appurtenant works subject to amortization May 31, 1969, was $145,181,882.

The total estimated cost of the project is $176,075,663. The final generating unit N-8 was completed and placed in operation on December 1, 1961.

Revenues from Hoover Powerplant are paid into the Colorado River Dam Fund, from which appropriations for operation and maintenance are made by Congress annually.

After making provision for operation, maintenance, and replacement of the project, annual payments of $300,000 to each of the States of Arizona and Nevada and annual transfers of $500,000 to the Colorado River Development Fund, the net revenue available for repayment of advances to the Treasury, with interest, amounted to $191,266,074 at May 31, 1977. With the exception of $25,000,000 allocated to flood control and the nonproject costs determined in accordance with the act of June 29, 1948 (62 Stat. 1112), the cost of construction, operation, maintenance, and replacement will be repaid to the United States in 50-year periods with interest at 3 percent per annum by the revenues from generating charges, the sale of energy, and other incidental revenues. These revenues are guaranteed by formal contracts with the energy allottees with rates based on the repayment of advances for construction within 50-year periods. The repayment of the advances of $25,000,000 allocated to flood control has been deferred without interest until June 1, 1987, after which time such advances so allocated to flood control shall be repayable to the Treasury as the Congress shall determine.

The dam and powerplant building and their appurtenances are owned, operated, and maintained by the United States. Generating, transforming, and switching facilities are owned by the United States but are operated and maintained by the Department of Water and Power of the City of Los Angeles and the Southern California Edison Company, Ltd., as agents of the United States.

The background and texts of Interior's "Contract for Lease of Power Privilege" with the Department of Water and Power of the City of Los Angeles and the Southern California Edison Company, Ltd., and the energy contracts of 1930 entered into pursuant to the Boulder Canyon Project Act of December 21, 1928, 45 Stat. 1057, and the later "Contract for the Operation of Boulder Power Plant" with Los Angeles and Edison, and the energy contracts entered into pursuant to the Boulder Canyon Project Adjustment Act, dated July 19, 1940, 54 Stat. 774, and the regulations promulgated thereunder on May 20, 1941, are set out in "The Hoover Dam Documents, Wilbur and Ely, 1948."

B.2 Current Contracts

The basic agency contract, No. I1r-1333, dated May 29, 1941, designated "Contract for the Operation of Boulder Power Plant," between the United States and the City of Los Angeles and its Department of Water and Power, and Southern California Edison Company, Ltd., is operative through May 31, 1987. Administration of the agency contract has been retained by Reclamation.

Nine energy contracts were entered into with the allottees of energy named in the general regulations of May 20, 1941. These collectively dispose of all firm and secondary energy to be generated at Hoover Dam during the period of June 1, 1937, to May 31, 1987.

Early in 1977 Reclamation established a committee to prepare data and criteria for marketing of Hoover energy after termination of current contracts. Following the creation of the Department of Energy on October 1, 1977, the current contracts for electric service and the responsibility for future marketing were transferred to WAPA. The responsibility for operation and maintenance of the powerplant remained with Reclamation.

The allocation of energy (and the allocation of the construction costs of Hoover Dam and Powerplant) is summarized as follows:

Contract No.	Contractor	Firm energy Allocation Percent	Date of Execution	Date of Termination
I1r-1334	Dept. of Water & Power	17.5554	May 29, 1941	May 31, 1987
I1r-1336	Metropolitan Water Dist.	35.2517	May 29, 1941	May 31, 1987
I1r-1455	State of Arizona	17.6259	Nov 23, 1945	May 31, 1987
I1r-1338	State of Nevada	17.6259	May 29, 1941	May 31, 1987
I1r-1335	So. Calif. Edison Co.	7.0503	May 29, 1941	May 31, 1987
I1r-1340	City of Glendale	1.8475	May 29, 1941	May 31, 1987
I1r-1337	City of Pasadena	1.5847	May 29, 1941	May 31, 1987
I1r-1341	Calif. Electric Power Co.	.8813	May 29, 1941	May 31, 1987
I1r-1339	City of Burbank	.5773	May 29, 1941	May 31, 1987

The Metropolitan Water District has the first right to all unused firm and all secondary energy for pumping water into and in its Colorado River Aqueduct. The City of Los Angeles, Southern California Edison Company, and California Electric Power Company are obligated to take and/or pay for, respectively, 55, 40, and 5 percent of all firm energy allocated to the States but unused by them or The Metropolitan Water District. The city and companies have also the right to use, in the same respective percentages, secondary energy unused by The Metropolitan Water District.

The United States reserves up to 20,000 kW, with the associated energy to be deducted equally out of the allotments to the City of Los Angeles and the Southern California Edison Company. The United States can use reserved power for its own use or for resale in its construction or operating camps, or for any purpose within a local area defined in the regulations. This reserved power is currently sold to the city of Boulder City, National Park Service and Bureau of Mines.

Allocation to the cities of Burbank, Pasadena, and Glendale is generated and transmitted by the City of Los Angeles. California Electric Power Company merged with Southern California Edison Company, but for purposes of accounting, contract No. I1r-1341 remains in full force and effect.

B.3 Operating Year Ending May 31, 1976

The following illustrates the kWh sales to these Boulder Canyon Project allottees of electric energy and the income therefrom for the operating year ending May 31, 1976, and the energy reserved by the United States for its own use.

To Municipalities	INCOME: Energy Sales kWh	INCOME: Net Amount	INCOME: Mills Net Per kWh
City of Burbank			
Firm	21,181,137	40,095.90	
Generating Charge		15,496.00	
Total Burbank	21,181,137	55,591.90	2.62
City of Glendale			
Firm	67,784,775	128,316.58	
Generating Charge		49,580.00	
Total Glendale	67,784,775	177,896.58	2.62
City of Pasadena			
Firm	58,142,643	110,064.03	
Generating Charge		42,524.00	
Total Pasadena	58,142,643	152,588.03	2.62
City of Los Angeles			
Firm	602,010,845	1,139,606.54	
Secondary	-0-	-0-	
Generating Charge		1,435,231.00	
Total Los Angeles	602,010,845	2,574,837.54	4.28
Total	749,119,400	2,960,914.05	3.95
Other Agencies of State Government			
State of Arizona			
Firm	646,694,271	1,224,196.26	
Generating Charge		927,607.00	
Total Arizona	646,694,271	2,151,799.26	3.33
State of Nevada			
Firm	646,694,271	1,224,192.26	
Generating Charge		1,024,757.00	
Total Nevada	646,694,271	2,248,949.26	3.48
Total	1,293,388,542	4,400,748.52	3.40
Privately Owned Utilities			
California Electric Power Co.			
Firm	45,720,000	86,547.96	
Secondary	-0-	-0-	
Generating Charge		211,251.00	
Total CEP Company	45,720,000	297,798.96	6.51
Southern California Edison Company			
Firm	207,969,940	393,687.11	

To Municipalities	INCOME: Energy Sales kWh	INCOME: Net Amount	INCOME: Mills Net Per kWh
Secondary	-0-	-0-	
Generating Charge		891,375.00	
Total SCE Company	207,969,940	1,285,062.11	6.18
Total	253,689,940	1,582,861.07	6.24
Other Sales to Public Authorities			
The Metropolitan Water District			
Firm	1,293,466,752	2,448,532.57	
Secondary	-0-	-0-	
Generating Charge		1,051,926.41	
Total (MWD)	1,293,466,752	3,500,458.98	2.71
Totals: (including Interdepartmental)	75,849,300	264,782.71)	
Regular Firm	3,665,513,934	6,938,817.92	1.89
Secondary	-0-	-0-	
Subtotal Energy	3,665,513,934	6,938,817.92	1.89
Generating Charge		5,770,121.00	
Total Charges	3,665,513,934	12,708,938.92	3.47

The following shows the disposition of energy reserved for United States use during the operating year ending May 31, 1976:

To Municipalities	INCOME: Energy Sales kWh	INCOME: Net Amount	INCOME: Mills Net Per kWh
Nonutility Expense			
Purchased Power - Energy		143,582.71	
Purchased Power - Generating Chgs.		121,200.00	
Total Purchased Power		264,782.71	
Sales of Electric Energy-Nonutility			
Boulder City:			
Firm	62,948,300	119,161.12	
Generating Charge		101,086.00	
Other Costs		20,466.00	
Total	62,948,300	240,713.12	3.82
National Park Service			
Firm	4,142,805	7,842.30	
Generating Charge		7,136.00	
Other Costs		2,536.00	
Total	4,142.805	17,514 30	4.23

To Municipalities	INCOME Energy Sales kWh	Net Amount	Mills Net Per kWh
Bureau of Mines			
Firm	1,385,000	2,621.81	
Generating Charge		3,180.00	
Other Costs		998.00	
Total	1,385,000	6,799.81	4.91
Pumping Energy			
Firm	5,405,190	10,232.03	
Generating Charge		9,798.00	
Other Costs		7,532.00	
Total	5,405,190	27,562.03	5.10
Above energy sales, except powerhouse pumps are delivered at Boulder City substation resulting in transmission losses of	1,968,005		
Total energy reserved for United States use	75,849,300	292,589.26	3.86
Excess of Nonutility Income, from sale of electrical energy to contractors listed over Nonutility Expense of Purchased Power shown above		27,806.55	

B.4 Hoover Powerplant Modification

A "Hoover Powerplant Modification Feasibility Investigation" is underway to determine the optimum feasible increased generating capacity which should be added to Hoover Powerplant. Under consideration are:

(1) Increasing the capacity of the existing generator units;

(2) Adding large units to the end of the penstocks; and

(3) Adding reversible pump generators to the end of the penstocks.

A peaking power needs survey initiated in May 1977, with a questionnaire sent to approximately 90 entities to determine their future peaking requirements, has been completed.

C. Parker-Davis Project

C.1 Background

The Parker Dam and Davis Dam power projects were authorized and constructed separately. The Parker Dam power project was authorized under the Rivers and Harbors Act of August 30, 1935 (Public Law 409, 74th Congress, 1st session, 49 Stat. 1028). The Davis Dam project was authorized under the Reclamation Act of 1939 (53 Stat. 1187), when a finding of feasibility was made by the Secretary of the Interior on April 26, 1941. Their consolidation into the Parker-Davis Project was authorized by Act of May 28, 1954 (68 Stat. 143).

The primary purpose of the Parker Dam was to provide a forebay from which The Metropolitan Water District of Southern California could pump water into its Colorado River Aqueduct. The dam was constructed with funds advanced by The Metropolitan Water District (MWD). Parker Dam Powerplant was later added to provide low cost electrical energy to Arizona and southern California. Power generation started on December 13, 1942. MWD is entitled to one-half of the power generated at Parker Dam.

Davis Dam provides regulation of the Colorado River below Hoover Dam for domestic use, irrigation use, and for delivery of water at the United States-Mexico International Boundary as required in Article 12(b) of the Mexican Water Treaty of November 8, 1945. The Davis Dam project also provides for production and transmission of electric energy.

The major project works include Davis Dam and Powerplant, Parker Dam and Powerplant, and a high voltage transmission system with substations which provide for delivery of energy to the customers and sectionalizing of the long transmission lines. Five generating units rated 45,000 kW each are installed at Davis Powerplant and four units of 30,000 kW each are installed at Parker. The transmission system includes 35 substations and approximately 1,545 miles of high voltage transmission lines.

The total estimated construction cost of the Parker-Davis Project is $152,859,558. The portion of the cost allocated to power excluding contributions and nonreimbursable costs will be repaid from power revenues with interest at 3 percent. In addition, costs allocated to irrigation pumping and to servicing the Mexican Treaty will be repaid from power revenues without interest.

All project works are operated and maintained by Government forces.

The Parker-Davis Project provides electrical service in various categories as follows:

(1) Wholesale firm power service has been provided under the terms and conditions of contracts with both preference and nonpreference contractors under the existing Schedule LC-F2 which provides an average rate of approximately 6.65 mills/kWh at 60 percent monthly load factor.

(2) The Parker-Davis Project has special rates for Federal irrigation pumping service. Power and energy are supplied at rates based principally on operation and maintenance costs under the terms and conditions of existing contracts with various irrigation districts in the Yuma, Arizona, area to meet Gila Project and Yuma Auxiliary Project irrigation pumping requirements. The rate charged under these contracts is 3.5 mills/kWh for Federal irrigation and drainage pumping, and 6.65 mills/kWh is charged for other project purposes.

(3) Power and energy are supplied from the Parker-Davis Project to meet requirements of the Colorado River Front Work and Levee System at the rate of 6.65 mills/kWh.

(4) The Parker-Davis Project provides domestic retail service at such places as the Parker-Davis Project camps at Parker and Davis Dams under Schedule LC-L3. This schedule provides energy at a rate of 8 mills/kWh. Under recent regulations Reclamation is in the process of developing a camp rate which is consistent with other utility rates in the local area.

(5) The Parker-Davis Project provides transmission service over the facilities of the Parker-Davis Project under several long-term contracts with preference contractors, and also has a number of contracts which provide for use of specific facilities. The rates for transmission service and use of facilities vary between contracts depending on the facilities used.

(6) Under an Agreement with the Colorado River Storage Project, the Parker-Davis Project provided and maintains specific additions to the Parker-Davis Project system which are required for the delivery of Colorado River Storage Project power and energy to Southern Division contractors. Payment is based on annual costs and charges are subject to annual adjustment for operation and maintenance costs, therefore, increased costs are automatically covered.

C.2 Contracts for the Sale of Power

Firm power and energy were marketed from the Parker-Davis Project to both preference and nonpreference customers in Arizona, southern California and southern Nevada, under terms and conditions of electric service contracts which terminated March 31, 1976, and December 31, 1977, respectively. The following exhibits summarize as of April 1, 1973, and July 1, 1975, the amounts under contract as firm and recapturable power with 14 preference contractors and two nonpreference contractors which are served by the Parker-Davis Project. The total amount of power under contract during the summer season is 215,025 kW, including 19,500 kW which are subject to recapture. The total amount under contract for the winter season is 161,275 kW, including 14,625 kW of recapturable power. The purposes of recapture, as established in the contracts, are for use in construction, operation, and/or maintenance of projects under the administrative control of the Bureau of Reclamation.

The following Parker-Davis contracts were in effect as of April 1, 1973, and July 1, 1975:

PARKER-DAVIS PROJECT
Contract Rates of Delivery As of July 1, 1975

Preference Customer	Summer			Winter		
	Recapturable[1]	Nonrecapturable	Total	Recapturable[1]	Nonrecapturable	Total
	kW	kW	kW	kW	kW	kW
Arizona Electric Power Cooperative, Inc. (Excluding MEC)	0	19,425	19,425	0	14,570	14,570
Mohave Electric Cooperative, Inc.	0	2,515	2,515	0	1,890	1,890
	0	21,940	21,940	0	16,460	16,460
Arizona Power Authority	3,035	0	3,035	2,275	0	2,275
Colorado River Resources, Division of, State of Nevada	8,080	45,060	53,140	6,060	33,810	39,870
Colorado River Indian Reservation	1,315	2,005	3,320	985	1,505	2,490
Edwards Air Force Base	2,020	15,030	17,050	1,515	11,270	12,785
Imperial Irrigation District	0	30,055	30,055	0	22,535	22,535
Mesa, City of, Arizona	0	9,590	9,590	0	7,190	7,190
Salt River Project	0	30,000	30,000	0	22,500	22,500
San Carlos Irrigation Project	2,020	14,025	16,045	1,515	10,515	12,030
Thatcher, Town of, Arizona	0	310	310	0	230	230
Wellton-Mohawk Irrigation & Drainage District	1,010	2,005	3,015	760	1,505	2,265
Yuma Irrigation District	0	1,500	1,500	0	1,125	1,125
Yuma Proving Ground	2,020	3,005	5,025	1,515	2,255	3,770
TOTAL PREFERENCE CUSTOMERS	19,500	174,525	194,025	14,625	130,900	145,525
Nonpreference Customers						
California-Pacific Utilities Company	0	6,000	6,000	0	4,500	4,500
Citizens Utilities Company	0	15,000	15,000	0	11,250	11,250
TOTAL NONPREFERENCE CUSTOMERS	0	21,000	21,000	0	15,750	15,750
TOTAL PARKER-DAVIS CONTRACT RATES OF DELIVERY	19,500	195,525	215,025	14,625	146,650	161,275

[1]Recapturable on 2-years' advance written notice for use in construction, operation and/or maintenance of projects under the administrative control of the Bureau of Reclamation.

PARKER-DAVIS PROJECT
Contract Rates of Delivery
Effective April 1, 1973
Kilowatts

Preference Customers	Firm		Recapturable		
	Summer	Winter	Summer	Winter[1]	Contract No.
Arizona Electric Power Cooperative, Inc.	19,425	14,570	0	0	14-06-300-1307
Arizona Power Authority	0	0	3,035	2,275	14-06-300-1311
Colorado River Commission	33,060	34,310	8,080	6,060	14-06-300-1302
Colorado River Indian Reservation	2,005	1,505	1,315	985	14-06-300-1205
Edwards Air Force Base	15,030	11,270	2,020	1,515	14-06-300-1300
Imperial Irrigation District	30,055	22,535	0	0	14-06-300-1301
Mesa City of, Arizona	9,590	7,190	0	0	14-06-300-1309
Mohave Electric Cooperative, Inc.	2,515	1,890	0	0	14-06-300-1308
Salt River Project	42,000	22,000	0	0	14-06-300-1207
San Carlos Irrigation Project	14,025	10,515	2,020	1,515	14-06-300-1204
Thatcher, Town of, Arizona	310	230	0	0	14-06-300-1310
Wellton-Mohawk Irr. & Drain. Dist.	2,005	1,505	1,010	760	14-06-300-1290
Yuma Irrigation District	1,500	1,125	0	0	14-06-300-1295
Yuma Proving Ground	3,005	2,255	2,020	1,515	14-06-300-1293
TOTAL PREFERENCE CUSTOMERS	174,525	130,900	19,500	14,625	
Nonpreference Customers					
California-Pacific Utilities Company	6,000	4,500	0	0	14-06-300-802
Citizens Utilities Company	15,000	11,250	0	0	14-06-300-991
TOTAL NONPREFERENCE CUSTOMERS	21,000	15,750			
TOTAL CONTRACT RATE	195,525	146,650	19,500	14,625	

[1]Recapturable on 2-years' advance written notice for use in construction, operation, and/or maintenance of projects under the administrative control of the Bureau of Reclamation.

Parker-Davis Project contracts were entered into with California-Pacific Utilities Company and Citizens Utilities Company to settle disputes which arose between Citizens Utilities Company and California-Pacific Utilities Company and the United States as to the rights of these contractors to renew contracts which provided a power supply from the Boulder Canyon Project. Both contracts provided for termination on December 31, 1972, with an option for renewal for a 5-period. Each entity exercised its option and the contracts remained in force through December 31, 1977.

C.3 Reallocations

On April 4, 1975, a proposed reallocation of Parker-Davis Project power and energy was published in the Federal Register. The effect of this reallocation was to redistribute the Parker-Davis Project power and energy which was under contract to the nonpreference customers. While the nonpreference customer contracts did not terminate until December 1977, arrangements were made with the Colorado River Storage Project to provide additional capacity and energy so that this reallocation could be made effective April 1, 1976.

Their totals of 21,000 kW summer allocation and 15,750 kW winter allocation were made available to increase the allocation to other preference Parker-Davis power customers.

On September 21, 1975, the Department of the Interior approved new allocations of Parker-Davis power to Parker-Davis customers (and for Southern Division customers of Colorado River Storage Project (CRSP) customers) substantially in accordance with Interior's proposal of March 20, 1975, 40 F.R. 66, pages 15101-15104.

Prior to the reallocation, the permanent available Parker-Davis power for the summer season was 195,525 kW to preference customers, 21,000 kW to nonpreference customers, and 38,975 kW for project purposes. The withdrawable allocation was 19,500 kW, so that there was a total of 254,000 kW for the summer season.

Comparable figures for the winter season were 130,000 kW, 15,750 kW, and 38,975 kW for a total of 185,625 kW. The withdrawable allocation was 14,625 kW.

The total summer season Parker-Davis figures were unchanged following reallocation although the amounts available to individual customers were adjusted.

The Parker-Davis permanent winter season reallocated total figures were adjusted slightly to 172,100 kW (from 171,350 kW) as were the withdrawable quantities to 13,900 kW (from 14,625 kW).

The background and reasons for the reallocation are set out in a memorandum of August 20, 1975, from the Commissioner of Reclamation to the Secretary of the Interior.

Lists of the Parker-Davis customers (and the CRSP customers) for both the summer and winter seasons before and after reallocation are as follows:

TABLE I
(Summer Season Allocations)

Customer or Load	PRESENT ALLOCATION					FINAL REALLOCATION (kW)				
	Parker-Davis Project					Parker-Davis Project				
	1. Permanent	2. Withdrawable	3. Total	4. CRSP	5. Total	6. Permanent	7. Withdrawable	8. Total	9. CRSP	10. Total
Ak-Chin Indian Community	----	----	----	----	----	----	----	----	4,500	4,500
Arizona Electric Power Coop.	19,425	----	19,425	12,300	31,725	21,100	----	21,100	13,400	34,500
Arizona Power Authority	----	3,035	3,035	----	3,035	----	3,300	3,300	----	3,300
Chandler Heights Citrus Irr. Dist.	----	----	----	400	400	----	----	----	450	450
Colorado River Indian Agency	2,005	1,315	3,320	750	4,070	5,500	----	5,500	750	6,250
DCRR of Nevada	45,060	8,080	53,140	28,500	81,640	49,050	8,750	57,800	30,900	88,700
Edwards Air Force Base	15,030	2,020	17,050	----	17,050	16,350	2,150	18,500	----	18,500
Electrical District No. 2	----	----	----	10,400	10,400	----	----	----	11,350	11,350
Electrical District No. 3	----	----	----	8,650	8,650	----	----	----	9,450	9,450
Electrical District No. 4	----	----	----	5,250	5,250	----	----	----	5,750	5,750
Electrical District No. 5 (Pinal)	----	----	----	3,250	3,250	----	----	----	3,550	3,550
Electrical District No. 5 (Maricopa)	----	----	----	1,700	1,700	----	----	----	1,850	1,850
Electrical District No. 6	----	----	----	6,250	6,250	----	----	----	6,850	6,850
Electrical District No. 7	----	----	----	4,950	4,950	----	----	----	5,400	5,400
Imperial Irrigation District	30,055	----	30,055	----	30,055	32,550	----	32,500	----	32,550
Littlefield Electric Coop.	----	----	----	200	200	----	----	----	250	250
Maricopa Co. Mun. Water Conservation	----	----	----	5,850	5,850	----	----	----	6,350	6,350
City of Mesa	9,590	----	9,590	4,850	14,440	10,450	----	10,450	5,250	15,700
Mohave Electrical Coop.	2,515	----	2,515	400	2,915	2,700	----	2,700	450	3,150
Navajo Tribal Util. Authority	----	----	----	2,500	2,500	----	----	----	2,700	2,700
Ocotillo Water Conservation Dist.	----	----	----	1,200	1,200	----	----	----	1,300	1,300
Queen Creek Irrigation Dist.	----	----	----	----	----	----	----	----	2,000	2,000
Roosevelt Irrigation Dist.	----	----	----	5,200	5,200	----	----	----	5,650	5,650
Roosevelt Water Conservation Dist.	----	----	----	2,500	2,500	----	----	----	2,700	2,700
City of Safford	----	----	----	1,200	1,200	----	----	----	1,300	1,300
Salt River Project	30,000	----	30,000	101,900	131,900	31,700	----	37,700	111,250	142,950
San Carlos Irrigation Proj.	14,025	2,020	16,045	1,750	17,795	15,250	2,150	17,400	1,900	19,300
San Tan Irrigation Dist.	----	----	----	----	----	----	----	----	950	950
Town of Thatcher	310	----	310	550	860	350	----	350	600	950
Wellton-Mohawk Irr. & Drain Dist.	2,005	1,010	3,015	250	3,265	2,200	1,000	3,200	300	3,500
Williams Air Force Base	----	----	----	2,200	2,200	----	----	----	2,400	2,400
Yuma Irrigation Dist.	1,500	----	1,500	----	1,500	1,600	----	1,600	----	1,600
Yuma Proving Ground	3,005	2,020	5,025	400	5,425	3,300	2,150	5,450	450	5,900
Priority Uses	38,975	----	38,975	----	38,975	42,400	----	42,400	----	42,400
Private Utilities	21,000	----	21,000	----	21,000	----	----	----	----	----
Total	234,500	19,500	254,000	213,350	467,350	234,500	19,500	254,000	240,000	494,000

TABLE II
(Winter Season Allocations)

	PRESENT ALLOCATION					FINAL REALLOCATION (kW)				
	Parker-Davis Project					Parker-Davis Project				
Customer or Load	1. Permanent	2. Withdrawable	3. Total	4. CRSP	5. Total	6. Permanent	7. Withdrawable	8. Total	9. CRSP	10. Total
Ak-Chin Indian Community	----	----	----	----	----	----	----	----	3,300	3,300
Arizona Electric Power Coop.	14,570	----	14,570	100	15,070	16,200	----	16,200	1,400	17,600
Arizona Power Authority	----	2,275	2,275	----	2,275	----	2,650	2,650	----	2,650
Chandler Heights Citrus Irr. Dist.	----	----	----	150	150	----	----	----	200	200
Colorado River Indian Agency	1,505	985	2,490	100	2,890	4,200	----	4,200	400	4,600
DCRR of Nevada	33,810	6,060	39,870	11,450	51,320	36,300	6,000	42,300	17,600	59,900
Edwards Air Force Base	11,270	1,515	12,785	----	12,785	13,450	1,500	14,950	----	14,950
Electrical District No. 2	----	----	----	5,850	3,850	----	----	----	4,500	4,500
Electrical District No. 3	----	----	----	1,400	1,400	----	----	----	1,650	1,650
Electrical District No. 4	----	----	----	2,100	2,100	----	----	----	2,450	2,450
Electrical District No. 5 (Pinal)	----	----	----	1,500	1,500	----	----	----	1,750	1,750
Electrical District No. 5 (Maricopa)	----	----	----	700	700	----	----	----	800	800
Electrical District No. 6	----	----	----	----	----	----	----	----	----	----
Electrical District No. 7	----	----	----	700	700	----	----	----	800	800
Imperial Irrigation District	22,535	----	22,535	----	22,535	26,300	----	26,300	----	26,300
Littlefield Electric Coop.	----	----	----	100	100	----	----	----	150	150
Maricopa Co. Mun. Water Conservation	----	----	----	1,300	1,300	----	----	----	1,500	1,500
City of Mesa	7,190	----	7,190	1,650	8,840	8,000	----	8,000	2,300	10,300
Mohave Electrical Coop.	1,390	----	1,890	200	2,090	2,200	----	2,200	250	2,450
Navajo Tribal Util. Authority	----	----	----	1,000	1,000	----	----	----	1,150	1,150
Ocotillo Water Conservation Dist.	----	----	----	500	500	----	----	----	600	600
Queen Creek Irrigation Dist.	----	----	----	----	----	----	----	----	----	----
Roosevelt Irrigation Dist.	----	----	----	1,000	1,000	----	----	----	1,150	1,150
Roosevelt Water Conservation Dist.	----	----	----	950	950	----	----	----	1,100	1,100
City of Safford	----	----	----	350	350	----	----	----	400	400
Salt River Project	22,500	----	22,500	29,350	52,050	22,500	----	22,500	38,250	60,750
San Carlos Irrigation Proj.	10,515	1,515	12,030	350	12,380	11,950	1,500	13,450	1,000	14,450
San Tan Irrigation Dist.	----	----	----	----	----	----	----	----	----	----
Town of Thatcher	230	----	230	200	430	250	----	250	250	500
Wellton-Mohawk Irr. & Drain Dist.	1,505	760	2,265	100	2,365	1,850	750	2,600	150	2,750
Williams Air Force Base	----	----	----	550	550	----	----	----	650	650
Yuma Irrigation Dist.	1,125	----	1,125	----	1,125	1,300	----	1,300	----	1,300
Yuma Proving Ground	2,255	1,515	3,770	200	3,970	2,900	1,500	4,400	250	4,650
Priority Uses	24,700	----	24,700	----	24,700	24,700	----	24,700	----	24,700
Private Utilities	15,750	----	15,750	----	15,750	----	----	----	----	----
Total	171,350	14,625	185,975	60,750	246,725	172,100	13,900	186,000	84,000	270,000

Ten-year power contracts were offered to the 12 Parker-Davis customers who received an allocation of Parker-Davis power. The contracts became effective April 1, 1976. They are not administered by WAPA.

C.4 Other Parker-Davis Revenues

In addition to the revenues received from the foregoing Parker-Davis contracts, other revenues are received by the project from the following sources:

Contract No. 14-06-300-1444
Arizona Power Authority
Wheeling
Facilities Charge
CUC Wheeling, Amend. No. 1

CRSP Transfer of Funds

Contract No. 176r-607
State of Nevada
Wheeling
Amargosa Capacity Charge

Arizona Public Public Service Co.
Wheeling (Letter Agreement dated June 12, 1975, through fiscal year 1976 and expected continuation with either APS or others)

Contract No. 14-06-300-1998
Nevada Power Company
Amargosa Reservoir Capacity Charge

Contract No. 14063002240
Nevada Power Company and Salt River Project
Spinning Reserve Capacity Charge or Emergency Assistance

Contract No. 14-06-300-1318
California-Pacific Utilities Company
Emergency Transmission Service

Contract No. 14-06-300-2335
Arizona Power Pooling Association
Wheeling

Contract No. 14-06-300-1569
Electrical District No. 2
Signal Facilities Charge

Miscellaneous Income
(Includes Contracts Nos. 14-06-300-2550-Bureau of Land Management, 14-06-300-1968-Phelps-Dodge, and 14-06-300-2577-Valley Electrical Association)

C.5 Reclamation's Project Use Loads

The line item designated "Priority Uses" in the aforementioned list of Parker-Davis (and CRSP) customers before and after reallocation refers to Reclamation's Project Use Loads served by the Parker-Davis Project. A description of those loads as of October 1, 1977, follows:

Gila Project Loads

There are a number of Gila Project loads located within the Wellton-Mohawk Irrigation and Drainage District (WMIDD) area. Among these loads are Pumping Plants Nos. 1, 2, and 3 which have a combined maximum peak demand of around 20 megawatts and a monthly energy use of about 10,000,000 kWh. Relift and drainage pumps scattered throughout the area have a total load of about 5 megawatts and consume approximately 2,500,000 kWh monthly. Energy usage for the preceding loads is billed to WMIDD at 3.5 mills/kWh (S-1) rate. Service to Wellton Camp, which is the Gila Project maintenance base, and to the residences of Wellton-Mohawk ditchriders, who maintain the Gila Project facilities, totals 250,000 kWh monthly and represents approximately a 750 kW load. These loads are also billed to the WMIDD, but at 6.65 mills/kWh (S-1 rate).

On the Yuma Irrigation District (YID) system out of Gila Substation, the Yuma relift pumps comprise a small Gila Project load, 150 kW and 20,000 kWh per month, which is billed to YID at 3.5 mills/kWh (S-1 rate).

On the Yuma Mesa Irrigation and Drainage District (YMIDD) system, combined Gila Project load is approximately 7,000 kW and 2,500,000 kWh monthly, billed to YMIDD at 3.5 mills/kWh (S-1 rate) except for a small amount being supplied to an office building at 6.65 mills/kWh (S-2 rate).

Approximately 35 Gila Project saline and sump pump sites are located in the Wellton-Mohawk area and represent a 1 megawatt (MW) load and an approximate monthly energy consumption of 500,000 kWh. This energy is billed to the Yuma Projects Office at 3.5 mills/kWh (S-1 rate).

Three Gila Project supply wells on the Yuma Projects system served off the 34.5-kV ties at Gila Substation create a load of about 288 kW and 180,000 kWh monthly. An arrangement between the Yuma Projects office and Yuma Irrigation District provides for this load to be billed to YID at 3.5 mills/kWh (S-1), with YID being reimbursed by the Yuma Projects Office.

Some of the numerous Reclamation drainage wells located in the South Gila Valley are also on the Yuma Projects system served off the 34.5-kV ties at Gila Substation and are Gila Project, Wellton-Mohawk Division, loads. The total load for these Gila Project drainage wells is about 304 kW with a monthly energy consumption of around 190,000 kWh. These drainage well loads are billed at 3.5 mills/kWh to the Yuma Projects Office.

Colorado River Front Work and Levee System Loads

The portion of Reclamation's South Gila Valley drainage wells which are not Gila Project loads and are also on the Yuma Projects system served off the 34.5-kV ties at Gila Substation are Colorado River Front Work and Levee System (CRFW&LS) loads. The CRFW&LS drainage well loads total about 208 kW and approximately 130,000 kWh monthly, payable by the Yuma Projects Office at 3.5 mills/kWh (S-1 rate).

Energy used by the CRFW&LS pumped storage facility at Senator Wash varies from 250,000 to 1,000,000 kWh monthly, dependent on the water releases from Parker Dam and the water requirements of Yuma area farmers. This energy is billed to the Yuma Projects Office at 6.65 mills/kWh (S-2 rate).

CRFW&LS wells served off the Yuma County Water Users' Association system have a combined monthly load of 2,500 kW and 1,300,000 kWh. This energy is billed to the Yuma Projects Office at 3.5 mills/kWh (S-1 rate).

Twelve drainage pumps constitute a 700 kW and 500,000 kWh monthly CRFW&LS load fed from the YID system. These loads are billed to the Yuma Projects Office at 3.5 mills/kWh (S-1 rate).

Parker-Davis Project Loads

The Parker-Davis Project employee residential load for Coolidge, Mesa, and Tucson Substations, and for Davis and Parker Dams totals approximately 70,000 kWh monthly and is billed to the employees at the rate of 8 mills/kWh (LC-13 rate).* The Parker-Davis Project Phoenix headquarters building area, which

*This rate is currently under review in accordance with a recent directive to increase Government housing and utility rates to be more in line with costs to the private citizens in the surrounding areas.

includes a small Central Arizona Project load, and the camp lights at Davis and Parker Dams together total to a monthly load of 200,000 kWh. This energy is accounted for at 6.65 mills/kWh (S-2 rate).

Following creation of the United States Department of Energy (DOE) on October 1, 1977, all Parker-Davis power contracts were transferred to DOE's Western Area Power Administration (WAPA) by the Department of the Interior for administration.

Since January 1, 1978, all Parker-Davis power contracts are with preference customers.

C.6 Rate Adjustments

Rate adjustment public information forums were held in Phoenix, Arizona, October 9, 1975. This followed publication and mailing of a "Parker-Davis Project Power Repayment Study - Brochure for Fiscal Year 1974, dated September 1975."

A Public Comment Forum was held in Las Vegas on December 1 and 2, 1975.

Initially, there were separate schedules for Parker Dam Power Project and for Davis Dam Project. From August 1, 1940, to January 1, 1963, the Parker Dam Power Project sold power and energy under Schedule R3-F1 which had an incremental charge for energy which, when averaged with the demand charge at 60 percent monthly load factor, resulted in an average rate variation of 4 mills/kWh to 6.25 mills/kWh.

The initial rate schedule for the Davis Dam Project was Schedule R3-F3, effective February 10, 1948, which had an incremental charge on the energy which, when averaged with the demand charge at a 60 percent monthly load factor, resulted in an average rate of 5 mills/kWh. Schedules R3-F4 effective May 1, 1953, and R3-F5, effective February 1, 1956, did not change the charges on the demand or energy.

On January 1, 1963, Schedule R3-F6 became effective. This rate combined the Parker and Davis Dam Projects rates into one schedule with an average rate of 5 mills/kWh at 60 percent monthly load factor. Schedule R3-F6 provided wholesale firm power service with a capacity charge of $0.875/kW of billing demand and an energy charge of $0.003 (3 mills/kWh). The minimum capacity charge was $0.875/kW per month of contract rate of delivery. Schedule R3-L7, implemented January 1, 1953, provided domestic retail service at a rate which charged $0.02/kWh for the first 100 kWh, and $0.005 (5 mills/kWh) for the balance of energy used. The minimum bill was $1.00 per month.

Effective April 1, 1974, Schedules LC-F1 and LC-L2 were promulgated and superseded Schedules R3-F6 and R3-L7. Wholesale firm power service was provided to both preference and nonpreference contractors at an average rate of approximately 6.65 mills/kWh at 60 percent monthly load factor.

The Parker-Davis Project had a special rate for Federal irrigation pumping services; e.g., 3 mills/kWh for Federal irrigation and drainage pumping, and 6 mills/kWh for other project purposes. Domestic retail service was provided at a rate of 7 mills/kWh; e.g., Parker-Davis Project camps at Parker and Davis Dams.

The following rate increases were made effective as of June 1, 1977, by Schedule LC-F2 (which superseded Schedule LC-F1).

(1) Increase the existing wholesale firm power rate of 1.35/kW per month and $0.003/kWh to $1.39/kW per month and $0.0035/kWh. This revised rate will provide an average rate of 6.65 mills/kWh at 60 percent monthly load factor.

(2) Increase the existing rate for domestic retail service from 7.0 mills/kWh to 8.0 mills/kWh.

C.6.1 Fiscal Year 1976 Repayment Study

This study for the Parker-Davis Project showed a need for an increase of approximately 14 percent in firm power revenues to insure the repayment of the Project. Firm power rates were previously set by the fiscal year 1974 Power Repayment Study and became effective on June 1, 1977. The rates included a demand charge of $1.39/kW per month and an energy charge of 3.5 mills/kWh.

The 1976 Study updated the 1974 Study by including actual OM&R costs and revenues for fiscal years 1975 and 1976, and the transitional quarter.

Rate increase hearings have been held in abeyance in order to permit organization of the Department of Energy.

C.7 Summary of Energy Deliveries and Income - Fiscal Years 1976, 1977

The following illustrates the kilowatthour sales to the Parker-Davis customers and the income therefrom for the 12-month period ending June 30, 1976.

Contractor	Energy Sales kWh	INCOME Net Amount	INCOME Mills Net Per kWh
Municipalities			
Town of Thatcher (Cochise Sub.)	1,578,075	9,378.23	5.94
Total	1,578,075	9,378.23	5.94
Other Agencies of State Government			
Arizona Power Pooling Assn.	149,652,734	917,570.21	6.13
Arizona Power Authority (Maricopa)	15,200,714	90,712.38	5.97
Div. of Colorado River Resources	263,767,572	1,581,471.22	6.00
Imperial Irrigation District	152,589,405	872,907.29	5.72
Salt River Project	145,124,000	877,632.00	6.05
WMIDD (WM Substation)	13,054,799	83,694.16	6.41
Relift and Drainage Pumps	23,164,259	69,492.77	3.00
Wellton Camp	1,319,315	7,915.89	6.00
Ditchriders	307,848	1,847.05	6.00
Pumping Plant No. 1	22,327,260	66,981.78	3.00
Pumping Plant No. 2	51,665,765	154,997.30	3.00
Pumping Plant No. 3	25,609,162	76,827.48	3.00
Yuma Irrigation District	3,417,083	32,425.00	9.49
Yuma Irrigation District (.003)	471,141	1,413.43	3.00
Yuma Irrigation District (.006)	9,600	57.60	6.00
Yuma-Mesa IDD (.003)	19,433,978	58,301.94	3.00
Yuma-Mesa IDD (.006)	97,644	585.85	6.00
Total	887,212,339	4,894,833.35	5.52
Other Agencies of Federal Government			
Bureau of Indian Affairs			
Colorado River Ind. Res. (Total)	24,675,786	240,926.41	9.76
Parker Dam	6,004,187		
Headgate Rock	10,306,324		
Parker, Arizona	8,365,275		
San Carlos Project (Total)	80,609,851	609,533.87	7.56
Coolidge	62,218,175		
Oracle	18,391,676		
Total	105,285,637	850,460.28	8.08
Privately Owned Utilities			
California-Pacific Utilities Co.	28,339,200	172,092.60	6.07
Citizens Utilities Co. (Total)	70,848,000	430,231.50	6.07
Hilltop	30,076,200		

Contractor	INCOME: Energy Sales kWh	INCOME: Net Amount	INCOME: Mills Net Per kWh
Nogales	35,947,800		
Parker Dam (Havasu)	4,824,000		
Total	99,187,200	602,324.10	6.07
Projects Not Engaged in Electric Operations			
CRFW Drainage Pumps	1,262,294	8,267.54	6.55
Saline Pumps	4,929,911	26,611.69	5.40
Gila Valley Drainage Pumps	2,354,537	11,927.65	5.07
CRFW Senator Wash	8,744,000	52,464.00	6.00
USBR Wells	14,580,743	105,704.83	7.25
Gila Valley Drainage Pumps	1,169,806	3,509.42	3.00
Total	33,041,291	208,485.13	6.31
Other Public Authority			
Air Force (Total)	87,831,800	516,789.15	5.88
Mead	12,239,000		
Blythe	75,592,800		
Army, Dept. of (Yuma Test Station)	22,169,547	142,007.39	6.41
Total	110,001,347	658,796.54	5.99
Domestic			
Camp Residents' Use (Davis Dam)	190,819	1,340.32	7.03
Total	190,819	1,304.32	7.03
Interdepartmental			
Camp Lights (Davis Dam)	177,106	1,239.76	7.00
Headquarters Area Lighting	1,587,900	9,528.20	6.00
Total	1,765,006	10,767.90	6.10
TOTAL FIRM SALES	1,238,261,714	7,236,385.91	5.84

In addition to the total firm sales of 1,238,261,714 kWh resulting in an income of $7,236,385.91, there were interchanges and other deliveries during this period making a "Grand Total Power Sales" of 1,621,868,375 kWh which did not change the above income figures.

However, there were transmission charges, discounts and other miscellaneous income of $2,887,777.31, $10.36, and $2,161,348.21, respectively, in addition to the aforenoted income of $7,236,385.91 during fiscal year 1976.

Data comparable to that for fiscal year 1976 follows for fiscal year 1977, ending September 30, 1977:

Contractor	INCOME Energy Sales kWh	Net Amount	Mills Net Per kWh
Municipalities, Towns & Villages			
City of Mesa	41,705,144	259,379.33	6.22
Town of Thatcher	1,622,160	10,245.98	6.32
Total	43,327,304	269,625.31	6.22
Other Agencies of State Government			
APPA	26,127,000	185,301.00	7.09
DCRR - 2628	270,093,600	1,711,089.53	6.34
ED-3 - 2626	13,446,135	82,590.61	6.14
Imperial Irr. Dist - 2630	157,495,435	997,209.13	6.33
Salt River Project - 2631	146,591,000	929,681.38	6.34
WMIDD - 2634	15,038,533	99,001.19	6.58
Ditchriders - I1r-1591	322,416	1,975.27	6.13
Pumping Plants 1,2,3, I1r-1591	81,091,850	257,624.75	3.18
Relift & Drainage Pumps I1r-1591	21,169,589	66,375.67	3.14
Wellton Camp I1r-1591	1,252,115	7,669.70	6.13
Yuma Irrigation Dist. - 2635	3,122,194	34,155.08	10.94
South Gila Valley			
Irrigation & Drge. Pumps - 1270	617,474	1,995.81	3.23
Other Project Uses - 1270	9,600	58.56	6.10
Yuma-Mesa Irrigation & Drainage District			
Yuma Mesa Division			
Irrigation & Drainage Pumps W102	18,076,962	57,598.19	3.19
Other Project Uses - W102	94,330	578.30	6.13
Total	754,548,233	4,432,904.17	5.87
Rural Cooperatives			
AEP Coop - 2661	95,116,816	591,625.05	6.22
ED-3 2626	2,485,305	18,188.41	7.32
Total	97,602,121	609,813.46	6.25
Other Agencies of Federal Government			
Bureau of Indian Affairs			
Colorado River Ind. Reservation			
Total - 2627	34,041,298	255,062.01	7.49
Bouse Tap	2,940,670		
Headgate Rock	24,352,889		
Parker Switchyard	6,747,739		
San Carlos Project (Total)-2632	83,202,570	538,458.35	6.47
Coolidge	44,040,570		
Oracle	39,162,000		
Total	117,243,868	793,520.36	6.77

Contractor	INCOME Energy Sales kWh	Net Amount	Mills Net Per kWh
Privately Owned Utilities			
Cal-Pacific Utilities Co.-802	28,274,400	178,128.60	6.30
Citizens Utilities Co. (Total)-991	71,551,515	452,062.11	6.32
Hilltop	39,770,100		
Nogales	21,540,500		
Parker Switchyard	3,435,100		
Black Mesa	6,805,815		
Total	99,825,915	630,190.71	6.31
Projects Not Engaged in Electric Operations (Reclamation Project Loads)			
Yuma Projects			
CRFW Drainage Pumps	1,828,241	8,760.42	4.79
CRFW Saline Pumps	1,344,009	6,696.92	4.98
S.G.V. Drge. Wells	2,166,738	9,483.77	4.38
S.W. P.G. Plant	9,068,000	55,522.50	6.12
YM&YV Drge. Wells	14,392,557	75,020.41	5.21
Gila Project WM Div. Drge. Wells (Delivery of Water to Mexico)	3,677,640	16,449.10	4.47
SGV Drainage Wells	1,225,741	3,846.10	3.14
Total	33,702,926	175,779.22	5.22
Other Public Authorities			
Dept. of Army (Yuma Proving Gd) 2636	20,826,652	149,672.88	7.19
Edwards Air Force Base (Total) 2629	89,118,400	564,072.85	6.33
Blythe	83,182,400		
Mead	5,936,000		
Total	109,945,052	713,745.73	6.49
Domestic			
Coolidge, Mesa, Tucson, (Res.)	90,268	511.39	5.67
Davis Camp (Gov. Employees)	477,117	3,398.70	7.12
Davis Camp (Non-Gov. Employees)	250,080	1,784.13	7.13
Parker Camp (Gov. Employees)	382,164	2,699.36	7.06
Parker Camp (Non-Gov. Employees)	550,580	3,867.84	7.03
Total	1,750,209	12,261.42	7.01
Interdepartmental			
Used by the United States			
Camp Lights (Davis Dam)	150,094	1,067.77	7.11
Camp Lights (Parker Dam)	486,685		
Headquarters Area Lighting	1,474,900	9,037.53	6.13

Contractor	INCOME		
	Energy Sales kWh	Net Amount	Mills Net Per kWh
Total	2,111,679	10,105.30	4.79
TOTAL FIRM SALES	1,260,057,307	7,647,945.68	6.07

In addition to the total firm sales of 1,260,057,307 kWh resulting in an income of $7,647,945.68, there were interchanges and other deliveries during this period, making a "Grand Total Power Sales" of 1,567,868,804 kWh which did not change the above income figures.

However, there were rents, discounts, other miscellaneous income and Power Pool Sales of $3,127,070.61, $51.67, $30,598.23, and $851,004.38, respectively, in addition to the aforenoted income of $7,647,945.68 during fiscal year 1977.

D. Colorado River Storage Project

D.1 Background

The Colorado River Storage Project (CRSP) and 11 participating projects were authorized April 11, 1956, by Public Law 84-485. Ten additional participating projects were authorized as follows: two by the Act of June 13, 1962, 76 Stat. 96; three by the Act of September 2, 1964, 78 Stat. 852; and five by the Act of September 30, 1968, 82 Stat. 886.

The Colorado River Storage Project as outlined in 1950 included 10 storage units. Four of these were authorized for construction by the Act of April 11, 1956 (flaming Gorge, Glen Canyon, Curecanti and Navajo). Together the four units provide 33,600,000 acre-feet of reservoir storage capacity and about 1,266,000 kW of installed generating capacity. About three-fourths of both capacities will be provided by the Glen Canyon Unit.

The storage units will perform two major essential functions. They will regulate streamflow so that water commitments to the Lower Colorado River Basin can be met in dry periods without curtailment of the development of water uses allotted the Upper Basin. Also, they will produce hydroelectric energy. The participating projects consume water of the Upper Colorado River System for irrigation, municipal and industrial purposes and participate in the use of revenues in the Basin Fund.

Revenues from the sale of the electric energy left after payment of the operating costs and the reimbursable construction costs of the storage units will be available for assistance in the repayment of costs of participating projects; namely, the irrigation costs of these projects that are beyond the payment ability of the irrigation water users. Transmission of the electric power to load centers will be a cooperative effort of existing public and private utilities and the Bureau of Reclamation. The storage Project reservoirs will also directly supply some water for irrigation and municipal and industrial uses. Extensive power transmission lines and facilities have been and are being constructed in conjunction with the Storage Project.

Participating projects are Reclamation projects consuming water apportioned to the Upper Colorado River Basin and requiring storage replacement and revenue assistance from the storage units in the repayment of irrigation costs. Twenty-one participating projects (and units) have been authorized to date. They will provide water for irrigation on about 900,000 acres of land, over 400,000 acre-feet of water annually for municipal and industrial uses, about 166,000 kW of electric power, and will provide recreation, fish and wildlife, flood control, and miscellaneous benefits.

D.2 Storage Projects

Curecanti Unit

The Curecanti Unit develops storage and power possibilities along a 40-mile stretch of a deep canyon section of the Gunnison River above the Black Canyon of the Gunnison National Monument and below the town of Gunnison, Colorado. The facilities include three dams and reservoirs with powerplants. The developments, in order moving downstream, are Blue Mesa, Morrow Point, and Crystal.

The Blue Mesa Dam, Reservoir, and Powerplant are constructed. Initial power was produced September 1967. The reservoir's total capacity is 941,000 acre-feet. The powerplant contains two 30,000 kW generators.

Morrow Point Dam and Reservoir, about 11 miles downriver from Blue Mesa Dam, is complete. The total storage capacity of the reservoir is 117,000 acre-feet. The powerplant contains two 60,000 kW generators.

Crystal Dam and Reservoir, about 8 miles below Morrow Point Dam, is complete. The capacity of the reservoir is 27,240 acre-feet. The powerplant will house a single 28,000 kW generator and is under construction.

Flaming Gorge Unit

Flaming Gorge Dam is on the Green River, a major tributary of the Colorado River, in northeastern Utah about 20 miles west and 6 miles south of the corner common to Utah, Wyoming, and Colorado. The dam is a concrete, thin arch structure, 502 feet high and 1,285 feet long and was completed in 1963. The reservoir has a total storage capacity of 3,789,000 acre-feet. The powerplant contains three 36,000 kW generators, the last one installed February 1964. Initial power was produced November 1963.

Glen Canyon Unit

Glen Canyon Dam is on the Colorado River in northern Arizona, about 13 river miles upstream from Lees Ferry and was completed in 1964. It is the only one of the authorized dams on the mainstream of the Colorado River. Glen Canyon Dam is a gravity arch concrete structure, 710 feet high and 1,560 feet long. The dam is one of the highest in the world and, of the Federally constructed dams, is second in height only to Hoover Dam in the United States (Oroville Dam in California is higher). The reservoir has a maximum capacity of 27,000 acre-feet. When full, it will cover about 163,000 acres and extend 186 miles up the Colorado River, nearly to the mouth of Green River, and 71 miles upstream on the tributary San Juan River. About 1,998,000 acre-feet of reservoir capacity is inactive and is useful for sediment accumulation, protection of fish, and helps provide the power head at the dam whose minimum power pool is 6,124,000 acre-feet of water. A powerplant and a switchyard have been constructed at the dam. The powerplant includes eight generating units with a total installed capacity of 950,000 kW. Storage of water in the reservoir was initiated January 23, 1963. Initial power was produced September 1964. The last generator was installed in February 1966.

Navajo Unit

Navajo Dam is on the San Juan River in New Mexico about 35 miles east of Farmington and was completed in 1963. The Navajo Reservoir has a total capacity of 1,709,000 acre-feet, of which about 12,600 acre-feet are inactive.

Transmission Division

The authorizing Act of April 11, 1956, provides that project powerplants and transmission facilities shall be operated in conjunction with other Federal powerplants, present and potential, so as to produce the greatest

practicable amount of power and energy that can be sold at firm power and energy rates. To carry out the provisions of the law, a high voltage transmission grid is largely completed which interconnects the plants of the authorized units and participating projects of the Storage Project and effects interconnection with other Bureau projects and with public and private utility systems in the market area, which includes Arizona, Colorado, New Mexico, Utah, Wyoming, and parts of California and Nevada.

Major transmission lines consist of approximately 476 miles of 345-kV transmission lines, 814 miles of 230-kV transmission lines, 315 miles of 138-kV transmission lines, and 117 miles of 115-kV transmission lines. Thirteen substations have been constructed as well as additions to three existing substations.

The constructed features of the Transmission Division will be operated and maintained by the United States.

Contracts covering interconnections and transmission service are in effect between the United States and the principal utilities in the Colorado River Storage Project marketing area. The utilities with which contracts are in effect consist of Arizona Public Service Company, Public Service Company of Colorado, Public Service Company of New Mexico, Pacific Power and Light Company, Utah Power and Light Company, California-Pacific Utilities Company, Colorado-Ute Electric Association, and Salt River Project Agricultural Improvement and Power District.

The contract with the Utah Power and Light Company contains wheeling arrangements under which preference customers receive storage project power over the facilities of the company. The contract with California-Pacific Utilities Company also provides for use of company facilities for wheeling.

Under agreements with Arizona Public Service Company, Pacific Power and Light Company, and Public Service of Colorado, the Bureau and the companies are coordinating the use of transmission facilities to provide for the interchange and transmission of power. The contracts with Colorado-Ute and Salt River provide for interconnection of facilities, interchange of electric power and energy, and for wheeling of power and energy by the United States for these two organizations.

In addition to the interconnection with the utilities, the storage project is also interconnected in Colorado and Wyoming to the Bureau's Western Missouri River Basin Project transmission system and in Arizona to the Bureau's Parker-Davis Project transmission system.

D.3 Powerplants and Reservoir Capacity

The installed powerplant nameplate capacity (in MW), the maximum and the live reservoir storage capacity (in acre-feet), respectively, for the following four storage units are:

	MW	Maximum (1000) Acre-Feet	Live (1000) Acre-Feet
Glen Canyon, Arizona-Utah	950	27,000.0	25,000.0
Flaming Gorge, Utah-Wyoming	108	3,788.9	3,749.0
Navajo, New Mexico-Colorado	0	1,708.6	1,696.0
Curecanti, Colorado	180	1,085.2	
	1238	33,582.7	

Comparable total figures for the 21 participating projects (10 of which were authorized by the CRSP Act of April 11, 1956, and 11 by subsequent acts of Congress) are 10 MW (Seedskadee) and 3,499,100 acre-feet. Additional powerplant capacity is authorized but not yet constructed; e.g., 133,500 kW of power on the Bonneville Unit of the Central Utah Project and a 23 MW powerplant is being planned at the Navajo Dam (see pages 65 and 81, Twenty-Eighth Annual Report of the Upper Colorado River Commission, September 30, 1976).

D.4 Participating Projects

The authorized participating projects are:

Name	Completed	Location
Paonia	January 1962	Colorado
Smith Fork	Fall 1962	Colorado
Florida	November 1963	Colorado
Silt	June 1967	Colorado
Fryingpan, Arkansas	97 percent complete 1976	Colorado
Fruitland Mesa	-	Colorado
Bostwick Park	-	Colorado
Dallas Creek	-	Colorado
Dolores	-	Colorado
San Miguel	-	Colorado
West Divide	-	Colorado
Animas-LaPlata	-	Colorado and New Mexico
Savory-Pot Hook	-	Colorado and Wyoming
Hammond	1962	New Mexico
Navajo Indian Irrigation	-	New Mexico
San Juan Chama	-	New Mexico
Central Utah		
Vernal Unit	1962	Utah
Bonneville Unit	1962	Utah
Upalco Unit	1962	Unit
Uintoh Unit	1962	Utah
Jenson Unit	1962	Utah
Emery County	1966	Utah
Lyman	-	Wyoming
Seedskadee	1964	Wyoming
Eden	1960	Wyoming

D.5 CRSP Power Rates

Public Law 84-485, which authorized the Colorado River Storage Project and participating projects on April 11, 1956, specifies that all reimbursable costs must be repaid within 50 years after the completion of each separable feature, with the provision that the irrigation features of a participating project may have a development period of up to 10 years.

Power rate schedule R4-F1, with demand restrictions for the summer and winter seasons, was established on March 6, 1962, with a $1.275/kW per month demand rate and 3 mills/kWh energy rate, averaging 6 mills/kWh at a load factor of 58.2 percent, the maximum load factor of the firm energy that the Bureau then contracted for.

A repayment study based on the July 1972 projections of future investment and operating costs indicated that the 6 mill rate no longer met the repayment requirements. The principal reasons for the lack of sufficient revenues appeared to be the increases in operation and maintenance costs, the fact that the water supply has been considerably below average, except for 3 years, since the initial inservice date of the first power feature, the higher than expected cost of firming energy purchases, and the steadily rising price levels which result in higher than expected future investment costs.

On June 1, 1977, Schedule UC-F2 became effective, superseding Schedule UC-F1 and the old rate R4-F1. It established the following monthly rates:

Capacity charge:	$1.34/kW of billing demand
Energy charge:	3.4 mills/kWh

D.6 Reallocation of CRSP Power

On September 21, 1975, the Department of the Interior approved new allocations of CRSP power for both Northern and Southern Division CRSP customers (part of the Southern Division includes Parker-Davis Project customers) and for the Parker-Davis Project customers. The allocations were substantially in accordance with Interior's proposal of March 20, 1975, 40 F.R. 66, pages 15101-15104.

Prior to the reallocation, the CRSP power available to Southern Division customers was 213,350 kW during the summer season. The largest single summer allocation was 101,900 kW to the Salt River Project. The second and third largest allocations were 28,500 kW to Nevada's Division of Natural Resources and 12,300 kW to the Arizona Electric Power Cooperative. The remaining 70,650 kW was divided among 23 customers in quantities ranging from 200 to 10,400 kW.

Of the 60,750 kW of CRSP power available during the winter season, the largest allocations were 29,550 kW to Salt River Project, 12,450 kW to Nevada and 5,850 kW to Arizona's Electrical District No. 2. The remaining 12,900 kW was divided among 22 customers in quantities ranging from 10 to 2,100 kW.

The reallocation of September 21, 1975, divided 240,000 kW during the summer season and 84,000 kW during the winter season. In addition to generally larger allocations to the 26 prior customers, one new customer was added, the Ak-Chin Indian Community.

Short-term allocations to Queen Creek Irrigation District and San Tan Irrigation District were extended.

The reallocation of 84,000 kW during the winter season went to the existing 25 customers with only the Ak-Chin Indian Community receiving a new allocation of 3,300 kW.

In addition to the 213,350 kW of summer allocation and the 60,760 kW of winter allocation, there were available to Southern Division customers an additional 26,650 kW and 23,240 kW during the summer and winter seasons, respectively. These additional kWs were originally allocated to preference customers but not placed under contract with those preference customers to whom they were allocated.

In 1975 these additional kWs were reallocated to the preference contractors and to a single new preference customer, the Ak-Chin Indian Community.

Lists of the CRSP customers (and the Parker-Davis customers) for both the summer and winter seasons before and after reallocation are set out in the chapter dealing with reallocation of the Parker-Davis Project power and are not repeated here.

The background and reasons for the reallocation are set out in a memorandum of August 20, 1975, from the Commissioner of Reclamation to the Secretary of the Interior.

Firm Electric Service Contracts

Contract offers were made to all entities in the Southern Division which received an allocation of CRSP firm power on September 24, 1975, from the Secretary of the Interior.

There are 25 CRSP contracts (including the Arizona Power Pooling Association (APPA) integrated contract) of which 14 were signed as of July 1, 1977, and 11 had not been signed (six are litigants in the Arizona Power authority (APA) withdrawal suit.) Seven Letter Agreements were signed as of July 1, 1977.

D.7 CRSP Withdrawal Suits

A lawsuit in opposition to the withdrawal of CRSP power was filed by Arizona Power Authority, Electrical District No. 3, Electrical District No. 4, Electrical District Number 5, Pinal County, Electrical District Number 6, Wellton-Mohawk Irrigation and Drainage District, Roosevelt Irrigation District, and the City of Safford, in December 1971. At a later date Electrical District Number Two intervened on behalf of APA, et al., and the Northern Division Power Association intervened on behalf of the United States.

In March 1975, a decision was rendered in favor of the United States. In September 1975, an appeal was filed by the Plaintiffs. The first hearing of the appeal was held December 19, 1975. The Plaintiffs still contend that the Secretary was not acting within his authority when he made an allocation which contained a preference based on geographical boundaries.

In March 1976, the Plaintiffs requested an injunction against withdrawal of the Southern Division CRSP power and energy pending a final decision on the court action. The request for injunction was granted, subject to the posting of a bond to cover the cost to Reclamation of purchasing energy to meet the increased commitments. CRSP had sufficient capacity to meet the increased commitment. Maricopa County Municipal Water Conservation District (MCMWCD) Number One, filing for intervention, has been rejected. MCMWCD subsequently filed a separate suit.

As of this writing, the Circuit Court of Appeals has ruled in favor of the Bureau. The Plaintiffs moved for a Writ of Certiorari from the Supreme Court, but this was denied.

Following creation of the United States Department of Energy on October 1, 1977, the CRSP power contracts were transferred to its Western Area Power Administration (WAPA) by Interior for administration.

D.8 Summary of Energy Deliveries and Income - Fiscal Years 1976, 1977

The following illustrates the kWh sales of CRSP power to Parker-Davis customers and the income therefrom for the 12-month period ending June 30, 1976.

Contractor	Energy Sales kWh	INCOME Net Amount	Mills Net Per kWh
Sales to Municipalities			
City of Safford (Cochise)	12,907,973	72,443.33	5.61
Town of Thatcher (Cochise)	2,598,170	15,575.96	5.99
Ak-Chin Indian Community	5,595,258	34,605.78	6.18
Total	21,101,401	122,625.07	5.81
Sales to Other Agencies of State Government			
Arizona Power Pooling Association	223,232,637	1,289,651.77	5.78
Div. of Colorado River Resources	81,990,295	624,820.41	7.62
Imperial Irrigation District	59,686,707	311,079.93	5.21
Imperial Irrigation District	21,435,000	257,220.00	12.00
Salt River Project	231,130,306	1,775,460.92	7.68
Salt River Project	239,875,000	2,988,931.32	12.46
Wellton-Mohawk IDD	6,587,676	51,588.23	7.83
Arizona Power Authority	1,800,000	20,000.00	11.11
Total	865,737,621	7,318,752.58	8.45
Sales to Rural Cooperatives			
Chandler Heights Citrus Irr. District	1,225,679	7,241.04	5.91
Chandler Heights Citrus Irr. District	120,000	1,440.00	12.00
ED-3 Pinal County (APS)	67,543,981	377,109.54	5.58
ED-3 Pinal County (APS)	18,570,000	222,840.00	12.00
ED-4	23,347,590	140,253.57	6.01
ED-5 Pinal County	13,797,939	78,433.02	5.68
ED-5 Maricopa County	5,086,545	29,713.64	5.84
ED-6 Pinal County (SRP)	76,650,000	427,950.00	5.58
ED-6 Pinal County (SRP)	5,000,000	60,000.00	12.00

Contractor	INCOME		
	Energy Sales kWh	Net Amount	Mills Net Per kWh
ED-7 Maricopa County (APS)	14,010,493	83,017.48	5.93
ED-7 Maricopa County (APS)	6,000,000	72,000.00	12.00
Littlefield Elec. Cooperative	975,400	5,764.20	5.91
Maricopa Co. Water Consv. Dist. 1 (APS)	38,553,239	212,085.72	5.50
Ocotillo Power Coop., Inc.	4,019,531	25,403.79	6.32
Queen Creek Irr. District	8,080,726	48,026.50	5.94
Queen Creek Irr. District	515,000	6,180.00	12.00
Roosevelt Water Cons. District	11,752,165	71,688.50	6.10
Roosevelt Irrigation District	19,974,990	111,523.78	5.58
San Tan Irrigation District	2,978,172	17,468.32	5.87
San Tan Irrigation District	150,000	1,800.00	12.00
Total	318,360,450	1,999,939.10	6.28
Other Agencies of the Federal Government			
Colorado River Indian Reser.	41,052,316	270,012.23	6.58
San Carlos Project	83,138,195	662,562.38	7.97
San Carlos Project	4,500,000	54,000.00	12.00
Total	128,690,511	986,574.61	7.67
Privately Owned Facilities			
Nevada Power Company	98,642,000	1,783,616.93	18.08
Arizona Public Service Company	180,298,000	2,613,550.43	14.50
Southern California Edison Company	71,468,000	714,980.00	10.00
Total	350,408,000	5,112,147.36	14.50
Other Sales to Public Authorities			
U.S. Department of Defense, WAFB	29,462,800	162,176.40	5.50
U.S. Department of Defense, YPG	2,666,391	25,024.30	9.37
Total	32,132,191	187,200.70	5.83
TOTAL FIRM SALES	1,068,057,174	6,930,680.74	6.49
TOTAL NONFIRM SALES	648,373,000	8,796,558.68	13.57

In addition to the above total firm sales of 1,068,057,174 kWh resulting in an income of $6,930,680.74 and total nonfirm sales of 648,373,000 kWh and an income of $8,796,588.68, there were interchanges and other deliveries (including 199,148,400 kWh for Hoover deficiencies) during this period making a "Grand Total Power Sales" of 2,102,258,475 kWh and an increase of $172,344 in income for a total of $15,899,583.23.

Data comparable to that for fiscal year 1976 follows for fiscal year 1977 (12 months ending September 30, 1977).

Contractor	INCOME		
	Energy Sales kWh	Net Amount	Mills Net Per kWh
Sales to Municipalities, Towns and Villages			
Ak-Chin Indian Comm. - 2637	17,985,710	119,195.99	6.63
City of Mesa - 2661	16,539,787	104,449.72	6.32
City of Safford - 2653	8,842,375	54,510.79	6.16
Town of Thatcher - 2657	1,928,081	12,935.45	6.71
Total	45,295,953	291,091.95	6.43
Sales to Other Agencies of State Government			
Chandler Heights Citrus Irr. D - 2638	1,538,214	10,137.51	6.59
DCRR - 2640	123,675,000	779,502.79	6.30
ED-2 - 2661	36,927,070	230,390.60	6.24
ED-3 (APS) Pinal - 2641	27,024,222	176,175.73	6.52
ED-4 Pinal - 2642	19,209,700	127,408.84	6.63
ED-5 Maricopa - 2643	6,622,900	42,371.81	6.40
ED-5 Pinal - 2644	13,151,184	84,127.56	6.40
ED-6 (SRP) Pinal - 2645	17,467,500	111,870.35	6.40
ED-7 Maricopa - 2646	15,302,308	99,188.37	6.48
Maricopa Co. Water Consv. Dist. 1 - 2648	19,563,088	125,874.57	6.43
Ocotillo WC Dist - 2650	4,059,249	28,238.49	6.96
Queen Creek Irrig. District - 2649	5,100,000	32,700.80	6.41
Roosevelt Irrig. District - 2651	16,618,056	108,109.79	6.51
Roosevelt Water Consv. District - 2652	9,690,000	61,278.33	6.32
Salt River Project - 2654	381,285,000	2,420,069.09	6.35
San Tan Irrigation District - 2656	2,422,500	15,550.21	6.42
Wellton-Mohawk Irrig. Dist. - 2658	1,693,726	23,784.95	14.04
Ariz. Power Pooling Assn.	14,220,078	84,953.04	5.97
Total	715,569,795	4,561,732.83	6.37
Sales to Rural Cooperatives			
AEP Coop - 2661 (APPA)	37,584,177	239,909.80	6.38
Littlefield Elec. Coop. - 2647	968,788	6,268.67	6.47
Total	38,552,965	246,178.47	6.39
Sales to Other Agencies of Federal Government			
Colorado River Indians - 2639	2,444,470	14,498.67	5.93
San Carlos Indians - 2655	7,395,000	46,647.88	6.31
Total	9,839,470	61,146.55	6.21

Contractor	INCOME: Energy Sales kWh	INCOME: Net Amount	INCOME: Mills Net Per kWh
Other Sales to Public Authorities			
U.S. Dept. of Defense WAFB-2659	7,190,637	47,739.43	6.64
U.S. Dept. of Defense YPG-2660	1,613,072	11,639.70	7.22
Total	8,803,709	59,379.13	6.74
TOTAL FIRM SALES	818,061,892	5,219,528.93	6.38

In addition to the "Total Firm Sales" of 818,061,892 kWh and an income of $5,219,528.93, there were interchanges and other deliveries and sales during this period making a "Grand Total Power Sales" of 1,805,247,216 kWh which did not change the above income figures.

However, there was other income (including $575,504.53 paid under protest and carried in a suspense account) of $417.97, $7,200.82, and $574,750.12, in addition to the aforementioned income of $5,219,528.93 during fiscal year 1977.

E. Navajo Project

E.1 Background

The Navajo Project (or Navajo Generating Station and Transmission System) was developed as a result of the authorization of the Central Arizona Project (CAP) as a part of the Colorado River Basin Project Act, Public Law 90-537, dated September 30, 1968, 82 Stat. 885.

CAP requires the pumping of water from the Colorado River some 200 miles to the Phoenix area and an additional 100 miles to the Tucson area. For that purpose an annual average quantity of 1.2 million acre-feet would be pumped from Lake Havasu behind Parker Dam, which alone involves an initial lift of approximately 800 feet, and a total pump lift of 1,200 feet to the Phoenix area, and would require approximately 500,000 kW of power. The failure of the proponents of CAP to obtain Congressional authorization of new hydroelectric projects, such as Bridge Canyon and Marble Canyon Dams, due to concern over the impact of the scenic qualities of the Grand Canyon and other environmental factors, forced consideration of other alternatives to obtain the needed energy. The most promising was Federal acquisition of a share of the generating capacity in a large thermal plant to be constructed by a group of public and private utilities.

Hence: Section 303 of the Colorado River Basin Project Act provided:

"Sec. 303. (a) The Secretary is authorized and directed to continue to a conclusion appropriate engineering and economic studies and to recommend the most feasible plan for the construction and operation of hydroelectric generating and transmission facilities, the purchase of electrical energy, the purchase of entitlement to electrical plant capacity, or any combination thereof, including participation, operation, or construction by non-Federal entities, for the purpose of supplying the power requirements of the Central Arizona Project and augmenting the Lower Colorado River Basin Development Fund: *Provided*, That nothing in this section or in this Act contained shall be construed to authorize the study or construction of any dams on the main stream of the Colorado River between Hoover Dam and Glen Canyon Dam.

"(b) If included as a part of the recommended plan, the Secretary may enter into agreements with non-Federal interests proposing to construct thermal generating powerplants whereby the United States shall acquire the right to such portions of their capacity, including delivery of power and energy over appurtenant transmission facilities to mutually agreed upon delivery points, as he determines is required in connection with the operation of the Central Arizona Project. When not required for the Central Arizona Project, the power and energy acquired by such agreements may be disposed of intermittently by the Secretary for other purposes at such prices as he may determine, including its marketing in conjunction with the sale of

power and energy from Federal powerplants in the Colorado River system so as to produce the greatest practicable amount of power and energy that can be sold at firm power and energy rates. The agreements shall provide, among other things, that—

"(1) the United States shall pay not more than that portion of the total construction cost, exclusive of interest during construction, of the powerplants, and of any switchyards and transmission facilities serving the United States, as is represented by the ratios of the respective capacities to be provided for the United States therein to the total capacities of such facilities. The Secretary shall make the Federal portion of such costs available to the non-Federal interests during the construction period, including the period of preparation of designs and specifications, in such installments as will facilitate a timely construction schedule, but no funds other than for preconstruction activities shall be made available by the Secretary until he determines that adequate contractual arrangements have been entered into between all the affected parties covering land, water, fuel supplies, power (its availability and use), rights-of-way, transmission facilities and all other necessary matters for the thermal generating powerplants;

"(2) annual operation and maintenance costs shall be apportioned between the United States and the non-Federal interests on an equitable basis taking into account the ratios determined in accordance with the foregoing clause (1): *Provided, however*, That the United States shall share on the foregoing basis in the depreciation component of such costs only to the extent of provision for depreciation on replacements financed by the non-Federal interests;

"(3) the United States shall be given appropriate credit for any interests in Federal lands administered by the Department of the Interior that are made available for the powerplants and appurtenances;

"(4) costs to be borne by the United States under clauses (1) and (2) shall not include (a) interest and interest during construction, (b) financing charges, (c) franchise fees, and (d) such other costs as shall be specified in the agreement.

"(c) No later than one year from the effective date of this Act, the Secretary shall submit his recommended plan to the Congress. Except as authorized by subsection (b) of this section, such plan shall not become effective until approved by the Congress.

"(d) If any thermal generating plant referred to in subsection (b) of this section is located in Arizona, and if it is served by water diverted from the drainage area of the Colorado River system above Lee Ferry, other provisions of existing law to the contract notwithstanding, such consumptive use of water shall be a part of the fifty thousand acre-feet per annum apportioned to the State of Arizona by article III (a) of the Upper Colorado River Basin Company (63 Stat. 31)."

In June 1968, the Secretary of the Interior met with representatives of various utilities which had expressed an interest in additional electric generating capacity in the Southwest (see elaboration herein on the negotiations leading up to the execution of Contracts for the Interim Sale of United States Entitlement of Navajo Project).

On September 30, 1969, the Secretary filed with Congress a report required by the Colorado River Basin Project Act, advising Congress of his findings that participation in the Navajo Project represented the most suitable alternative for supplying the power requirements of CAP.

The site of the Navajo Generating Station near Page, Arizona, was selected for the following reasons:

(1) it was approximately 80 miles from a reliable coal supply on the Black Mesa on the Hopi and Navajo Indian Reservations;

(2) Cooling water was available from nearby Lake Powell;

(3) It was near the town of Page, Arizona, and its support facilities; and

(4) It was close to load centers in Arizona, Nevada, and southern California to minimize transmission costs.

E.2 Physical Features

The Navajo Project consists of: the 2,310 MW *Navajo Generating Station* whose construction started in April 1970 on land leased from the Navajo Tribe near Page, Arizona. Its major feature (three units - each 750,000 kW (nameplate rating) coal fired steam electric generating units, were completed May 1974, 1975, and 1976, respectively); the Black *Mesa and Lake Powell Railroad*, constructed by the Project, which delivered coal mined by Peabody Coal Company from Reservation lands leased from the Navajo and Hopi

Tribes; the *Southern Transmission System*, two 500-kV transmission lines which connect the generating station with the Westwing Switchyard in the Phoenix Area; and the *Western Transmission System*, a single 500-kV line, which connects the generating station with the McCullough Switchyard of the Department of Water and Power of the City of Los Angeles in the Las Vegas area.

The Bureau of Reclamation is a participant in the Navajo Project pursuant to Section 303 of the Colorado River Basin Project Act (82 Stat. 885) dated September 30, 1968, and the determination by the Secretary of the Interior that such participation is the most practicable means of supplying the power requirements of the Central Arizona Project and augmenting the Lower Colorado River Basin Development Fund. The Central Arizona Project, consisting of pumping plants, canals, dams and holding reservoirs, is designed to deliver water from Lake Havasu behind Parker Dam on the Colorado River to the Phoenix and Tucson areas.

E.3 Participants

The participants in the project and their percentages of participation are as follows:

	Percentage of Participation	Approx. Kilowatts to be Received
Salt River Project[1]	21.7	501,000
Los Angeles Dept. of Water & Power[2]	21.2	490,000
Arizona Public Service Co.[3]	14.0	323,000
Nevada Power Co.[4]	11.3	261,000
Tucson Gas & Electric Co.	7.5	173,000
Bureau of Reclamation[5] (The only Federal participant)	24.3	561,000

[1]The Salt River Project is Project Manager and Operating Agent for the Navajo Generating Station.
[2]The Los Angeles Department of Water & Power is Project Manager for the Western Transmission System and Operating Agent for the McCullough Substation of the Western Transmission System.
[3]The Arizona Public Service Company is Project Manager and Operating Agent for the Southern Transmission System.
[4]The Nevada Power Company is Operating Agent for the Navajo-McCullough 500-kV line of the Western Transmission System.
[5]Salt River Project, in addition to owning 21.7 percent in its own name, owns 24.3 percent of the generating station and railroad and varying percentages of the features of the transmission systems for the use and benefit of the United States.

E.4 Navajo Project Documents and Contracts

The basic contractual framework for the project is as follows.

(1) The Indenture of Lease, Navajo Units, 1, 2 and 3, among the Navajo Project Cotenants (the participants other than the United States) and the Navajo Tribe, dated as of September 29, 1969. The Indenture of Lease provides the land and land rights for the plantsite, pumping plantsite, rail loading site, and ash disposal area, transmission communication, railroad rights-of-way on Navajo Reservation lands and related rights.

The Lease provides for a term of 50 years with an option to extend for an additional 25 years at an annual rental of $90 an acre, subject to adjustment. The annual rental for the plantsite, rail loading site, and ash disposal area is $160,000 a year.

The Lease covers air and water pollution; e.g., precipitators must have a design efficiency of 99.5 percent, the Tribe's consent that the 34,100 acre-feet of water from Arizona's Upper Basin allocation of 50,000 acre-feet shall be available for station uses, and preference in employment to qualified Navajos. During the first 35 years of its term the Tribe is not to impose taxes and thereafter it may impose taxes at a rate not in excess of one-half of the amount of property taxes imposed by the State of Arizona. Coverage is provided in the event the State of Arizona is found to be without authority to tax property located on the Reservations.

(2) Grant of Right-of-Way and Easements, with the consent of the Tribe, pursuant to 25 U.S.C. Sec. 323, from the Secretary of the Interior to the Navajo Project Cotenants, dated December 10, 1969, for the plantsite, rail loading site, ash disposal area, and related facilities, approved January 19, 1971.

(3) Contract for Water Service from Lake Powell for the Generating Station, between the United States and Salt River Project, dated January 17, 1969, No. 14-06-300-5033. It provides that the Salt River Project may divert up to 40,000 acre-feet a year from Lake Powell and may consumptively use up to 34,100 acre-feet a year in the Generating Station at an annual charge of $7 per acre-foot. A 40-year term is provided, with options to extend. The navajo Tribal Council has enacted two resolutions relating thereto, CD 108-68, dated December 11, 1968, and CJW-69, dated June 3, 1969. The contract was assigned by the Salt River Project to the other non-Federal participants on December 22, 1969.

(4) Navajo Project participation agreement, No. 14-06-300-2131, among the Navajo Project Cotenants and the United States, dated as of September 30, 1969. This agreement sets forth the ownership interests in the Generating Station and the Transmission System. It covers the relationship between the Salt River Project and the United States and requires the consent of the United States to all Project agreements which the Salt River Project may enter into where the United States is not a party; sets the basic terms and conditions and the obligations of the parties for construction, operation and maintenance of the Navajo Project; and may be superseded, in whole or in part, by subsequent project agreements.

The Participation Agreement provides that if the Salt River Project should incur any liability or burden because of its relationships with the United States, they shall be shared among all the coowners on the basis of their ownership interests in the Generating Station. It also provides clauses with regard to defaults, resolution of disputes, insurance coverages, and the division of any liabilities due to property damage or personal injuries which may exceed or may not be covered by the insurance required.

The term of the Participation Agreement is for the period needed for completion of all the Project agreements or, lacking completion, for a 50-year term.

(5) Contracts dated September 30, 1969, between the United States and each of the cotenants and between the United States and Southern California Edison Company for "Interim Sales of United States Entitlement in the Navajo Project." These contracts, which are listed below and are also termed "layoff contracts," dispose of the United States Navajo Project entitlement of power and energy through September 30, 1989, subject to termination by the United States upon 5 years written notice effective on or after January 1, 1980, if the power and energy sold thereunder is required by the United States for the other purposes of the Colorado River Basin Project Act. The background and scope of these contracts are more fully covered hereinafter.

Contracts for "Interim Sales of United States Entitlement in the Navajo Project" (Layoff Contracts)

Contract No.	Contractors	Percentage of U.S. Entitlement	*Capacity
No. 14-06-300-2136	Salt River Project	19.6%	for 107.2 MW
No. 14-06-300-2137	Arizona Public Service Company	3.0%	for 16.4 MW
No. 14-06-300-2134	Nevada Power Co.	2.5%	for 13 7 MW
No. 14-06-300-2138	Tucson Gas & Electric Company	1.6%	for 8.7 MW

Contracts for "Interim Sales of United States Entitlement in the Navajo Project" (Layoff Contracts)

Contract No.	Contractors	Percentage of U.S. Entitlement	*Capacity
No. 14-06-300-2133	City of Los Angeles Dept. of Water & Power	13.4%	for 73.3 MW
No. 14-06-300-2135	So. Cal. Edison Co.	59.0%	for 327.5 MW
		100.0%	for 546.8 MW

*Based on nameplate capacity of 750 MW per unit.

(6) Memorandum for Recordation of Navajo Station Coal Supply Agreement and Imposition of Equitable Servitude and Covenant Running with the Land, dated December 1, 1970, and Navajo Station Coal Supply Agreement, dated September 30, 1969, between the Navajo Project Cotenants and Peabody Coal Company, providing for a coal supply for the Generating Station for a term of 35 years subject to extension by the Cotenants for up to an additional 15 years conditioned upon Peabody having adequate reserves of suitable coal available at its Black Mesa Mine 80 miles away. Approximately 234 million tons of strip reserves and 34 million tons of deep reserves were dedicated by Peabody Coal Company to the Navajo Project. The Coal Supply Agreement was amended February 18, 1977, to provide greater assurance of a coal supply and increased prices. The failure of Peabody Coal to provide the quantities of coal needed to operate the project at its full capacity led to damage claims and several contracts for the purchase of supplemental coal. However, Peabody is expected to have adequate equipment at its coal mine in 1978 to deliver adequate coal for three unit operations at the Generating Station.

(7) Grant of Federal Rights-of-Way and Easements pursuant to 25 U.S.C. Sec. 323, dated January 19, 1971, from the Under Secretary of the Interior to the Navajo Project Cotenants for the railroad and related facilities.

(8) Power Coordination Contract, No. 14-06-300-2132, dated as of September 30, 1969, among the Navajo Project participants. This contract sets the method of determining rates for sales, purchases, and exchanges of energy between the parties. The United States waived its usual "wheeling stipulation."

(9) Interim Arrangement for Interconnected Operations, No. 14-06-300-2139, dated as of September 30, 1969, among the Navajo Project participants and Southern California Edison Company. This Agreement covers forecast capacity resources margins, spinning reserve capacity, emergency service, interruptible load as a substitute for spinning reserve capacity, and system operations.

(10) Multiparty Agreement dated December 1, 1970, among the Navajo Project Cotenants, Peabody Coal Company, Green River Coal Company, C. Chesney McCracken and Frank J. Keller, as trustees, St. Louis Union Trust Company, and Morgan Guaranty Company. This Agreement embodies certain understandings of the parties in the event of a default by Peabody under the Navajo Project Coal Supply Agreement.

(11) Cotenancy Agreement dated March 23, 1976, No. 14-06-300-2271, the basic title agreement between the participants. This established the terms and conditions relating to the respective interests and obligations of the parties.

(12) Southern Transmission System Construction Agreement between the participants dated March 23, 1976, No. 14-06-300-2272. Arizona Public Service Company was named Project Manager.

(13) Western Transmission System Construction Agreement between the participants dated March 23, 1976, No. 14-06-300-2273.

(14) Navajo Generating Station Construction Agreement between the participants dated March 23, 1976, No. 14-06-300-2274. Salt River Project was named Project Manager.

(15) Edison-Navajo Transmission Agreement, dated May 21, 1973, No. 14-06-300-2299, between the participants and southern California Edison Company. This covers the interconnection of the Navajo Transmission System with the 500 kV transmission line from Four Corners to the Mohave Project of the Moenkopi switching station and the operation of the two 500 kV transmission lines. It also covers installation of series capacitors on the Navajo-McCullough 500-kV transmission line and the Moenkopi-Eldorado 500-kV transmission line.

The following contracts have been completed in draft form:

(a) East Wing - West Wing Rights-of-Way Agreement. The principles for interconnection of the United States Navajo Project West Wing facilities with the 230-kV Liberty-Pinnacle Peak transmission facilities and the principles for necessary amendments to existing contracts have been informally agreed to with Salt River Project;

(b) Navajo Generating Station Operating Agreement;

(c) Southern Transmission System Operating Agreement;

(d) Western Transmission System Operating Agreement;

(e) Interconnection Agreement, Four Corners - Navajo-Mohave. Draft is in substantially final form but execution has been postponed indefinitely due to basic disagreement regarding Bureau of Reclamation reserves; policy question remains as to whether the Bureau of Reclamation will agree to a mutual release of liability provision.

E.5 Litigation

The Navajo Project has given rise to the following litigation:

(1) *The Jicarilla Apache Tribe of Indians et al.* v. *Morton et al.*, consolidated with *National Wildlife Federation et al.* v. *Morton et al.*, Civil No. 71-566-PHX-WCF (D.C. Ariz.), alleging violation of the National Environmental Policy Act, 42 U.S.C. Sections 4321 et seq. The District Court held for the defendants. Oral argument of Plaintiffs' appeal to the Ninth Circuit was held on July 13, 1972.

(2) *Lomayaktewa et al.* v. *Morton et al.*, Civil No. 72-106 PCT-WCF (D.C. Ariz.), attacking the validity of the Black Mesa strip mining lease between Peabody Coal Company and the Hopi Tribe. This action, originally filed in the District of Columbia, was transferred to the United States District Court for the District of Arizona on March 3, 1972.

(3) *Arizona Power Pooling Association et al.* v. *Morton et al.*, Civil No. 72-125-PCT-WPC, filed in August 1971, challenging the validity of the contracts for interim sale of the United States Navajo Project entitlement to Southern California Edison Company, Nevada Power Company, and Tucson Gas and Electric Company, all nonpreference customers. Arizona Power Authority Intermountain Consumer Power Association, and Bountiful, Utah, have intervened on behalf of the Plaintiff.

The District Court held in favor of the United States. Plaintiff's appeal was heard in September 1975. The Appellate Court reversed the District Court and remanded the case for further proceedings.

A clarification of the order was requested and issued in December 1975. A Petition for a Writ of Certiorari, filed by the Private Utility Defendants with the Supreme Court, was, however, denied. In the meantime, the Plaintiffs are exploring the possibility of arriving at a settlement with the nonpreference layoff contractors.

The City of Anaheim filed for an injunction against the sale of United States entitlement power to Edison Company pending resolution of existing court actions. The preliminary injunction was denied, but the Plaintiffs have appealed the decision.

A similar suit has been filed by the cities of Riverside, Anaheim and Banning, California. The court has delayed review of this suit pending final action on the APPA suit.

E.6 Committees

The Navajo Project participants (includes the United States) established two major committees. These were a Legal and Negotiating Committee, composed of their legal, engineering, and administrative represent-

atives, which drafted the foregoing agreements, and the Coordinating Committee, composed of the heads of the respective groups or their representatives, which establishes policy for the Project.

E.7 Department of Energy

Creation of the new United States Department of Energy on October 1, 1977, which absorbed a portion of Reclamation's power and energy functions, led to a division of authority in administering Interior's power contracts. The Navajo Project basic agreements remained with Interior, although Reclamation's contracts for the interim sale of the United States entitlement in the Navajo Project (also termed "layoff contracts") and the Navajo power coordination contract became the responsibility of the Department of Energy, Western Area Power Administration.

E.8 Navajo Project Precipitators

Work is continuing on improving the performance of the precipitators. The State of Arizona is requiring additional air quality monitoring and reports when the State standards are exceeded. SRP is continuing to work with the precipitator manufacturer and consultants to bring the precipitator and performance and availability up to acceptable standards.

Still unresolved is whether the Environmental Protection Agency (EPA) and the State of Arizona will require installation of additional equipment for the control of SO_2. Monitoring performed jointly by EPA and SRP indicated that both Federal and State standards have been met with the use of the existing installed equipment. Neither EPA nor the State of Arizona has officially advised SRP that additional equipment will not be required.

E.9 Review of Negotiations and Circumstances Leading Up To The Execution of the Contracts for Interim Sale of United States Entitlement of Navajo Project

The Colorado River Basin Project Act, Public Law 90-537, dated September 30, 1968, authorized the construction, operation, and maintenance of the Central Arizona Project. With regard to a power supply for operation of the project, Section 303(b) provided as follows:

> "If included as a part of the recommended plan, the Secretary may enter into agreements with non-Federal interests proposing to construct thermal generating powerplants whereby the United States shall acquire the right to such portions of their capacity, including delivery of power and energy over appurtenant transmission facilities to mutually agreed upon delivery points, as he determines is required in connection with the operation of the Central Arizona Project. When not required for the Central Arizona Project, the power and energy acquired by such agreements may be disposed of intermittently by the Secretary for other purposes at such prices as he may determine, including its marketing in conjunction with the sale of power and energy from Federal powerplants in the Colorado river system so as to produce the greatest practicable amount of power and energy that can be sold at firm power and energy rates."

Negotiations looking toward contractual arrangements for the purchase of entitlement to electric power and transmission capacity in non-Federal facilities were initiated in June 1968 with Secretary of the Interior Udall. Public and private utilities in the Southwest were invited to participate, and a steering committee was formed consisting of a representative from each interested utility and the Bureau of Reclamation. The initial non-Federal parties were: San Diego Gas & Electric Company; Southern California Edison Company (SCE); Department of Water and Power of the City of Los Angeles (LADWP); Nevada Power Company; Salt River Project Agricultural Improvement and Power District (SRP); Arizona Public Service Company (APS); Tucson Gas and Electric Company (TG&E); El Paso Electric Company; and Public Service Company of New Mexico. While others attended the June meeting, the above group constituted the core of those interested.

The steering committee, through several task forces, studied the problems involved in the construction and operation of the power generation and transmission facilities, including design, costs, legal and tax considerations, coal leases and other property agreements, socioeconomic aspects, loads and resources.

At this point, the proposed project consisted of two powerplants, one near Page, Arizona (Navajo), and one near Farmington, New Mexico (Four Corners), with six 820 MW units and a total capacity of 4,920 MW.

In February 1969, the El Paso Electric Company and the Public Service Company of New Mexico decided not to participate in the joint project. This decision necessitated modification of the initially contemplated development. Negotiations continued.

Efforts were made to reach preference customers who might be interested and offer them a chance to participate. These included: Intermountain Consumer Power Association, Salt Lake City, Utah; City of Farmington, New Mexico; City of Anaheim, California; Arizona Power Authority, Phoenix, Arizona; Plains Electric B & T Cooperative, Albuquerque, New Mexico; and Rawlins, Ellis, Burrus and Kiewit, Phoenix, Arizona.

In May 1969, the San Diego Gas & Electric Company and the Southern California Edison Company each decided that it did not desire to participate in the joint effort. This decision required a new look at the proposed joint development, since some 2,000 MW, or about 40 percent of the total generating capability, was destined for these two utilities.

A smaller joint participation project of 2,310 MW was proposed in June 1969, consisting of one powerplant near Page, Arizona (Navajo), with three units having an expected effective output of 770 MW each and a transmission system consisting of a 500-kV line from the plant to the Colorado River near Boulder City, Nevada, and two 500-kV lines to the Phoenix area. The City of Anaheim, California, and the Arizona Power Authority indicated an initial interest in the project, but decided later not to participate.

The participation by the United States in the Navajo Project provided the United States a share (24.3 percent) of the generation available from the Navajo Generating Station, and a share of the transmission facilities which were to be constructed as a part of the Navajo Project.

Under the terms and conditions of the contracts for participation in the Navajo Project, the availability of the United States share of generation was contingent upon the operation of the Navajo Generating Station. Under this condition, power is available only when the generating units are operating. Therefore, each utility participant had to make its own arrangements for reserves and for an alternate source of power during periods of time when the Navajo Generating Station units are out of service for maintenance or other reasons. Similarly, the ability to receive this power at the project delivery points which are located in Phoenix, Arizona, and the Boulder City, Nevada, areas is contingent on the operation of the Navajo Project transmission system. This contingent operation presents a similar requirement for each utility participant to provide its own reserves. In the event of an outage of the transmission system, the power being supplied from the Navajo Project may or may not be available to the participants. In the event delivery cannot be completed, a utility participant must have its own alternate power source to replace the Navajo generation.

The Navajo Project contracts also provide that when transmission capacity available to the participants is insufficient to accommodate all of the firm use of the transmission system, the use of available capacity will be allocated proportionately to each participant. This creates another situation which requires each utility to provide its own reserves.

Public Law 90-537, which was effective September 30, 1968, provided that the Secretary was to submit his recommended plan to the Congress within 1 year from the effective date of the Act, that is, by September 30, 1969. With this deadline in mind, Reclamation, in order to present a complete and viable proposal, was faced with the necessity of assuring contractual arrangements for the sale of the United States entitlement to Navajo Project during the period beginning with the April 1974 anticipated inservice date of Unit No. 1 of the Navajo Generating Station and ending with the estimated time of requirement for pumping power for the Central Arizona Project, which then was January 1980. It was necessary, therefore, to complete assured arrangements by September 30, 1969, with customers who would agree to take and pay for the United States share during the interim period, subject to the reserve and transmission requirements applicable to all participants.

The first draft of a Proposed Contract for the Sale of Interim Power for United States entitlement of Navajo Project was prepared by representatives of the Lower Colorado Region, Bureau of Reclamation, and by letter dated May 1, 1969, was distributed to the members of the Committee on Interim Use of United States Entitlement of Navajo-Four Corners Project.

The second draft of Proposed Contract for the Sale of Interim Power dated July 22, 1969, was prepared by representatives of the Lower Colorado Region and was distributed to members of the Committee on Interim Use of the United States Entitlement of Navajo-Four Corners Project by memorandum dated July 23, 1969.

Other possible customers for the purchase of interim power, including preference customers, were canvassed. These included: Arizona Electric Power Cooperative, Inc. (AEPCO); Imperial Irrigation District (IID); El Paso Electric Company; R. W. Beck and Associates; Plains Electric G & T Cooperative, Inc.; and the Colorado River Commission of Nevada.

Because the availability of power and energy from the Navajo Project is contingent upon the operation of the generating units and the associated transmission system, the purchasers were required to provide reserves. Therefore, drafts of the contracts for interim sale were submitted to each preference customer having its own generation or an alternate source of power to provide such reserves, and which was accessible to adequate transmission network capable of delivering the power. The preference customers in this category were Los Angeles, Salt River, Imperial Irrigation District, Plains Electric, and AEPCO (a member of Plaintiff Arizona Power Pooling Association).

Except for LADWP, IID, and SRP, none of the above preference customers indicated positive interest in the proposal for the interim purchase of the United States entitlement. AEPCO did not respond at all. IID responded that it would be interested if economical and practical transmission arrangements could be developed, but the problems involved in working out such arrangements within the necessary time frame were insurmountable.

Because of the lack of response, except from the participants and SCE, a concerted effort was made to obtain sale contracts with the participants and with Southern California Edison Company.

The negotiations of the contracts for interim use of United States entitlement continued among representatives of APS, LADWP, NPC, SRP, SCE, TG&E, and USBR. The form of contract which was agreed upon by all representatives was prepared and distributed by letter dated October 2, 1969. The contract, in essentially the same form, was executed shortly thereafter by the purchasers. Each purchaser executed a separate contract with the United States. All of the contracts were then executed on behalf of the United States in December 1969, effective as of September 30, 1969.

E.10 Summary of Energy Deliveries and Income - Fiscal Year 1977

The following illustrates the kWh sales to the "layoff" contractors and the income therefrom for the 12-month period ending September 30, 1977.

Contractor	Energy Sales kWh	INCOME Net Amount	Mills Net Per kWh
Municipalities, Towns and Villages			
City of Los Angeles Department of Water and Power (Contract No. 14-06-300-2133)	479,111,000	$ 5,867,509.18	12.15
Total	479,111,000	5,867,509.18	12.25
Other Agencies of State Governments			
Salt River Project Agricultural Improvement and Power District (Contract No. 14-06-300-2136)	698,193,000	8,614,559.84	12.34

Contractor	INCOME: Energy Sales kWh	INCOME: Net Amount	INCOME: Mills Net Per kWh
Total	698,193,000	8,614,559.84	12.34
Privately Owned Utilities			
Arizona Public Service Company (Contract No. 14-06-300-2137)	107,067,000	1,313,510.74	12.27
Nevada Power Company (Contract No. 14-06-300-2134)	88,400,000	1,095,268.90	12.39
Southern California Edison Company (Contract No. 14-06-300-2135)	2,140,451,000	25,677,647.38	12.00
Tucson Gas and Electric Company (Contract No. 14-06-300-2138)	57,106,000	700,749.27	12.27
Total	2,393,024,000	28,787,176.29	12.03
TOTAL FIRM POWER SALES	3,570,328,000	$43,269,245.31	12.12
Penalties			
Tucson Gas and Electric Company (Contract No. 14-06-300-2138)		677.30	
Southern California Edison Company (Contract No. 14-06-300-2135)		13,409.12	
		$ 14,086.42	
Miscellaneous Electric Income			
Arizona Public Service Company (Contract No. 14-06-300-2137)		834.54	
Nevada Power Company (Contract No. 14-06-300-2134)		20,930.00	
Total		21,764.54	
GRAND TOTAL	3,570,328,000	$43,305,096.27	

F. Pacific Northwest - Pacific Southwest DC Intertie

F.1 Background

The Pacific Northwest-Pacific Southwest DC Intertie began in 1961 when President Kennedy, in his message to Congress on natural resources, directed the Secretary of the Interior to develop plans for interconnection of the areas served by the Department's power marketing agencies. The first Intertie proposal consisted of four major high voltage lines:

(1) A 750-kV DC line from The Dallas Dam, Oregon, via Nevada to Sylmar Substation, Los Angeles, plus a 345-kV AC line from Hoover Dam to Phoenix, Arizona;

(2) A 500-kV AC line from John Day Dam, Oregon, via the Central Valley of California to Vincent Substation, Los Angeles, California;

(3) A 750-kV DC line from The Dallas Dam, Oregon, to Hoover Dam, connected to Los Angeles by a 750-kV DC line, and to Phoenix, Arizona, by a second 345-kV AC line; and

(4) A 500-kV AC line from John Day to Table Mountain in the Central Valley of California, and thence to Vincent Substation, Los Angeles, California.

The physical detail and economic data on this proposal were submitted to the Appropriations Committees of the Congress by the June 1964 Report of the Secretary of the Interior to the House and Senate Appropriations Committees on the Pacific Northwest-Pacific Southwest Intertie. Congressional authority for construction of the Intertie was provided in the 1965 Public Works Appropriations, the Act of August 14, 1964, 78 Stat. 756. This authority was conditioned, however, by the report by the Senate Appropriations Committee which provided that construction of the Intertie lines was not to commence until a review was completed which found that The Dalles-Hoover Dam would be financially feasible and self-liquidating over its service life.

In October 1964, the Feasibility Report on the Dalles-Hoover DC Intertie was submitted to the Appropriations Committees. As this report supported the economic feasibility of The Dalles-Hoover line, Bonneville Power Administration (BPA) and the Bureau of Reclamation were directed to proceed with construction of the Federal portions of the Intertie Project.

The two 500-kV AC lines and an 800-kV DC line from The Dalles Dam to the southern California area were completed and have been in service since 1963, 1969, and 1970, respectively. A 345-kV line and associated facilities were constructed from Mead Substation, near Hoover Dam, to Liberty Substation near Phoenix with a connecting 230-kV line to Pinnacle Peak Substation north of Phoenix. These facilities were placed in service in 1968.

Contracts were awarded for the construction and installation of the DC terminal at Mead Substation. Preliminary survey and acquisition of right-of-way were completed for The Dallas-Hoover DC line. The initial proposal included an expected inservice date of 1971.

As a result of several delays in appropriation of funds, by 1969 the proposed inservice date of the "Hoover" DC Intertie had been delayed to the extent that the involved entities were forced to make other arrangements for a power supply. This resulted in an announcement by the Assistant Secretary for Water and Power Development, in May 1969, that the construction of the "Hoover" DC line would be postponed.

Since the postponement of construction in 1969, several meetings have been held with the interested entities to reexamine the need for and interest in the Intertie based on updated costs, loads and available resources. During these reviews, both BPA and Reclamation took the position that any action which would involve a significant expenditure of funds must be contingent upon rather firm commitments on the part of the entities which would use the line.

A review, which was initiated in 1975, indicated that there was not adequate interest to justify a complete reanalysis and feasibility study of the "Hoover" DC line.

F.2 Task Forces

In view of the increased costs of installing generating facilities on both the Pacific Northwest and Pacific Southwest systems, together with the greatly increased fuel costs and the need for conservation of fossil fuels, a review of the interests and need for the "Hoover" Intertie was initiated in August 1975. As a result of this review three task forces were established as follows:

(1) System Studies Task Force;

(2) Economic Evaluation Task Force; and

(3) Environmental Task Force.

The System studies task force was chaired by Bonneville Power Administration, with representation by U.S. Bureau of Reclamation, Arizona Public Service Company, Salt River Project, and Nevada Power Company.

Salt River Project chaired the Economic Evaluation Task Force, with representation from the same entities as the System Studies Task Force.

The Environmental Task Force was chaired by U.S. Bureau of Reclamation and included representatives from Bonneville Power Administration.

F.2.1 System Studies Task Force

The following is a summary of the conclusions reached by the System Studies Task Force:

(1) The technical requirements for a 1,440 MW or 2,200 MW transmission system between Pacific Northwest and Southwest could be most effectively met by a ± 500-kV bipolar overhead HVDC transmission line; i.e., 1,000-kV DC Intertie.

(2) The best location for the northern terminal is Celilo. The preferred location for the southern terminal is the Phoenix area rather than Mead. The transmission line would be 1,054 miles long.

(3) The system as proposed would enhance the performance of the connected AC systems.

(4) When losses are accounted for, the effective transmission capacity of the DC system, defined as the power delivered to the receiving AC system at rated conditions, for the proposed 1,440 MW and 2,200 MW systems would be 1,326 MW and 1,940 MW, respectively.

(5) Based on the effective transmission capacity, the estimated investment costs for the 1,440 MW and 2,200 MW systems would be $353/kW and $296/kW, respectively.

(6) The incremental investment cost for the additional 614 MW transmission capacity available for the 2,200 MW system would be only $175/kW. Comparison of annual costs show similar potential advantage for the higher capacity system.

(7) The 2,200 MW system could be built in two stages to accommodate potential growth of line loading and to effect additional benefits by deferment of investment costs for part of the terminals.

(8) To meet the January 1984 energization date, award of construction contracts is required by April 1979.

The cost estimates for the 1,400 MW system components are tabulated on Table 1 of "PNW-SW Intertie, dated February 1976."

In order to meet growth of transmission capacity requirements, a viable alternative would be to build a 2,200 MW converter terminal in two stages.

F.2.2 Economic Evaluation Task Force

The evaluation by the Task Forces shows that the Celilo-Phoenix area 1,000 kV DC Intertie is feasible and that it should be completed by January 1984.

The overall annual benefit-to-cost ratio for a 1,440 MW system is approximately 2.1 to 1, based on those benefits which can be evaluated. Total equivalent annual benefits are estimated to be $84,563,000 and annual costs $40,950,000. The total investment cost is estimated to be $467,600,000.

Long-term benefits evaluated in this report are outlined below:

(1) Exchanges of summer-winter surplus peaking capacity between the Northwest and Southwest to reduce capital expenditures for new generating capacity;

(2) Sale of surplus Northwest secondary energy to Southwest utilities; and

(3) Sale of Southwest energy to the Northwest to firm up peaking hydro sources during critical water years.

The proposed Intertie would also provide a means for conservation of significant amounts of fossil fuels by the following:

(1) Use of surplus hydroelectric energy;

(2) Foregoing installation of thermal peaking resources; and

(3) Increased efficiency of operation of hydro and thermal resources.

F.2.3 Environmental Task Force

The Task Force has agreed that environmental studies will be the individual responsibility of the U.S. Bureau of Reclamation and Bonneville Power Administration on those portions of the line under each agency's jurisdiction. However, study methods will be consistent.

The Task Force has submitted an A-95 Notice to be circulated to various Federal, State, and local agencies and clearinghouses in accordance with the provisions of the Office of Management and Budget Circular A-95. The Task Force has also established contact with appropriate Federal, State, and local planning agencies that may have jurisdictional involvement or interest in the project (see "Second Supplemental Report on the Feasibility of the Celilo-Mead (The Dalles-Hoover) DC Intertie," Bonneville Power Administration, U.S. Bureau of Reclamation, February 1976, for Cost Estimates, Financial Information Summary, PNW Surplus Energy Available, Benefits in Dollars, and Present Worth Analysis).

Completion of the studies on feasibility of the Intertie have been held in abeyance since February 1977 pending completion of peaking resource studies in the northwest.

In order to insure completion of the project, two major areas of concern need to be resolved: (1) quantification of available northwest peaking resources; and (2) assurances of future funding.

The WAPA is now responsible for completion of the Intertie.

F.3 Intertie Contracts

The following "Intertie" contracts have been executed by Interior's Bureau of Reclamation. They are now being administered by the United States Department of Energy, Western Area Power Administration, which is administering the Intertie. The contracts involve the use of the Mead-Liberty line and the operation and maintenance of the phase-shifter. Those marked with an asterisk are revenue producing.

Contractor	Number and Date	Description of Agreement
Arizona Public Service Co.	7-07-30-P0009 June 6, 1977	Advancement of funds for use of 230-kV facilities at Liberty Substation
Bonneville Power Adm'n. (Department of Energy)	14-06-300-2329 Bonneville No. 14-03-09239 August 15, 1972	Exchange energy
*City of Los Angeles, Dept. of Water and Power (210 MW - for delivery of purchase from SRP)	14-06-300-1988 December 11, 1967	Mead Interconnection
	14-06-300-2489 December 17, 1973 (also CRSP)	Nonfirm transmission service
Letter Agreement	April 1, 1977	Advancement of funds for proposed Mead Interconnection
*Division of Colorado River Resources, State of Nevada (30 MW Capacity - delivery of purchases from Public Service Co. of New Mexico)	14-06-300-2611 October 29, 1975	Firm transmission service over Mead-Liberty-Pinnacle Peak-Glen Canyon-Four Corners transmission facilities
*Glendale, California	14-06-300-2474 June 1, 1973	Nonfirm transmission service

Contractor	Number and Date	Description of Agreement
The Metropolitan Water District of So. California	14-06-300-2004 March 29, 1968	Mead Interconnection
*Nevada Power Co.	14-06-300-1996 January 1, 1968	Mead Interconnection
*Nevada Power Co.	14-06-300-2248 October 21, 1971	Advancement of funds for purchase, installation and modification; payment for OM&R of transfer-tripping facilities at Mead Substation
*Nevada Power Co.	14-06-300-2698 August 2, 1976 (also CRSP)	Nonfirm transmission services
*Salt River Project Agricultural Improvement and Power District (Revenue) (-160 MW capacity - delivery of Mohave entitlement)	14-06-300-2002 March 11, 1968	Mead Interconnection and firm transmission service
*Salt River Project Agricultural Improvement and Power District	14-06-300-2260 June 30, 1975	Nonfirm wheeling
*Salt River Project Agricultural Improvement and Power District	14-06-300-2391 October 1, 1973	Use and operation of facilities
Southern California Edison Co.	14-06-300-1871 July 31, 1967	Mead Interconnection
Southern California Edison Co.	14-06-300-2496 May 1, 1974	Advancement of funds for installation of digital dispatch security monitoring equipment at Mead Substation
Letter Agreement	May 9, 1975	Amends No. 14-06-300-2496

The following contract is administered by Interior's Bureau of Reclamation:

Nevada Power Co.	14-06-300-2178 June 1, 1970 (Also BCP)	Lease of telephone circuits

The following contract is under the joint administration of Western Area Power Administration and Reclamation:

Multiparty agreement betweeen Navajo Project participants	14-06-300-2438 February 4, 1974	Operation, maintenance, and replacement of phase-shifting transformer at Liberty Substation

CHAPTER IV

THE UPPER COLORADO RIVER BASIN COMPACT

Another milestone in the development of the "Law of the River" was the execution of the Upper Colorado River Basin Compact on October 11, 1948, following negotiations that began in July 1946. It contained the agreement of the Upper Basin States to a division of the Colorado River waters apportioned to the Upper Basin by the Colorado River Compact of 1922 so that projects could be developed in those States.

The Compact was ratified in January and February 1949 by the five signatory States and consented to by Congress in a bill approved by the President on April 6, 1949, 63 Stat. 31 (see pages 1-14, First Annual Report of the Upper Colorado River Commission, March 20, 1950).

After apportioning to Arizona the consumptive use of 50,000 acre-feet of water annually, the following percentages of the total quantity available for use each year by the Upper Basin were as follows:

Colorado	51.75 percent
New Mexico	11.25 percent
Utah	23.00 percent
Wyoming	14.00 percent

The major provisions of the Compact are contained in Chapter I, part G, entitled "The Law of the River." The text of the Compact appears in Appendix 1 G.1.

CHAPTER V

THE COLORADO RIVER STORAGE PROJECT ACT

The Colorado River Storage Project Act became law on April 11, 1956, 70 Stat. 105. Its major provisions are contained in Chapter I, part H, entitled "The Law of the River."

The Act provided a comprehensive, multiple-purpose, Basin-wide resource development plan for the Upper Basin. It authorized construction of four storage projects (Glen Canyon, Flaming Gorge, Navajo, and Curecanti) and 11 participating projects for irrigation and related uses, and further investigation of other projects.

Further details of the Act and the power contracts which are vital elements of the Storage Project are contained in Chapter III, part D, entitled "Power—Colorado River Storage Project."

The text of the Act appears in Appendix 1 H.1.

CHAPTER VI

GENERAL PRINCIPLES TO GOVERN, AND OPERATING CRITERIA FOR, GLEN CANYON RESERVOIR (LAKE POWELL) AND LAKE MEAD DURING THE LAKE POWELL FILLING PERIOD

A. Background

The Colorado River Storage Project Act of April 11, 1956, Public Law 84-485, 70 Stat. 105, authorized construction of four storage units in the Upper Basin, including Glen Canyon Dam, primarily for river regulation and power production. It would permit the Upper Basin States to utilize their share of Colorado River water and, at the same time, insure the fulfillment of downstream commitments. The Act required the Department of the Interior to submit to the Congress periodically payout and related financial studies. This required estimates of power head at Glen Canyon Dam and assumptions as to streamflows and water uses.

B. Participation by States

As construction progressed, Secretary of the Interior Udall initiated studies, in consultation with the various interests in the Colorado River Basin, to determine how Lake Powell could accumulate storage with the least possible disruption to the many activities then dependent upon the flow of the river. These studies led to formulation of the "Filling Criteria" (see Senate Document No. 7, 88th Congress, 1st Session, March 14, 1963, entitled, "Colorado River Storage Project and Participating Projects," the text of which is included in Appendix 601). A memorandum from the Commissioner of Reclamation to the Secretary of the Interior, dated January 18, 1960, recited the background events.

Pursuant to Secretarial invitations of October 4, 1957, a meeting was held in Washington, D.C., on October 24, 1957, attended by the Governors, or their representatives, of the seven Basin States and by other interested persons.

At that time a statement prepared by the Bureau of Reclamation was discussed which included an analysis of certain assumed procedures under which storage would be accumulated in the Upper Basin reservoirs. This used average flows of the river during the period 1958-1970 and was termed "Hydrologic Bases for Financial Studies, Colorado River Storage Project" (Senate Document No. 101, 85th Congress, 2nd Session; the statement, as revised, is a part of Senate Document No. 77, 85th Congress, 2nd Session). At that meeting, the States of Arizona, California and Nevada offered for consideration their "Tri-State Criteria" (Senate Document No. 96, 85th Congress, 2nd Session).

These were based upon the principles that the Lower Basin's right to the consumptive use of water is superior to the right to store water at Glen Canyon; that releases should be made from Glen Canyon for all Lower Basin consumptive use requirements, the Mexican Treaty requirements, and evaporation and channel losses; and that releases from Glen Canyon shall be in amounts required to generate the contracted quantities of energy at Hoover Dam.

Both were unacceptable to the Upper Basin. California also questioned the assumptions used by the Department of the Interior (Governor Knight's letter of November 25, 1957).

A second meeting was held on December 4 and 5, 1957, in Las Vegas, Nevada, where the Department of the Interior presented clarifying revisions in its hydrological data. Subsequently, an engineering group representing the Lower Basin States and the Bureau of Reclamation met on February 3 and 4, April 17 and 18, June 25 and 26, September 23 and 24, December 8 and 9, 1958, and March 4 and 5, 1959. A series of operational studies were made covering certain assumptions of runoff sequences. These differed from the average streamflows used in the "Hydrologic Bases." A summary dated August 20, 1959, was submitted by the Lower Basin engineering group.

Bureau of Reclamation engineers also met on March 30 and 31, and August 4 through 6, 1959, with the Upper Colorado River Commission engineering committee which had made a number of operating studies. A summary thereof appears in the committee's letter of September 22, 1959.

Certain conclusions became apparent to the Bureau of Reclamation in the discussions which indicated the difficulty of satisfying both Basins in a single set of regulations and that latitude was needed for the Secretary to operate on a year by year basis. These conclusions were:

(1) Nothing should be done at Glen Canyon which would have an adverse effect on the users of water below Hoover Dam or from the mainstream between Lake Mead and Glen Canyon;

(2) Secondary energy should not be generated at Hoover Dam except when all reservoirs are full and a spill would otherwise occur; and

(3) The obtaining of the minimum power head at Glen Canyon reservoir, elevation 3490 (6.1 maf) at the earliest practicable time, should be an objective of any filling criteria.

The most difficult aspect and basic to the solution of the filling problem was an answer as to what to do about any deficiency that might occur in the firm energy generation at Hoover Powerplant incident to filling the Upper Basin Storage Project reservoirs. This was the most troublesome of the problems.

C. Bureau of Reclamation's Initial Proposal

On January 18, 1960, the Bureau of Reclamation proposed the following set of governing principles and operating criteria as a tentative proposal open for discussion. These were based upon the proposition that an allowance should be made for computed deficiency in firm energy generation at Hoover, which might be caused by Glen Canyon being on the river. The principles were not applicable to Flaming Gorge, Navajo or Curecanti (see memorandum of July 17, 1962, from Associate Solicitor Weinberg to Commissioner of Reclamation).

Paragraph 1. The principles were asserted to be based upon a reasonable exercise of Secretarial discretion without attempting to define the outer limits of either rights or obligations of any of the States or of the United States, and recognized that changes might be required by the forthcoming Decree in *Arizona* v. *California*.

Paragraph 2. This defines the filling period, during which the principles would apply, as generally the time required to fill Glen Canyon; i.e., elevation 3700, with a cutoff date of May 31, 1987, the date when the Hoover power contracts expire.

Paragraph 3. This states that during the filling period, uses of water below Hoover Dam, other than power, will be satisfied, including delivery of not more than 1.5 maf/yr to Mexico, which is the Treaty obligation. Releases from storage in either Glen Canyon or Lake Mead would depend on the content of the reservoirs and on inflow.

Paragraph 4. This states that the uses of water for consumptive purposes will be met between Glen Canyon and Lake Mead.

Paragraph 5. This provides an allowance for computed deficiency in Hoover firm energy which is created by virtue of operations at Glen Canyon. Determination of deficiency depends upon two calculations. The first is to determine the so-called Hoover basic firm, which is that firm energy that would have been produced at Hoover without Glen Canyon on the river and using an overall efficiency factor for power operations of 83 percent. The second calculation would be to adjust the energy actually generated at Hoover to an efficiency factor of 83 percent rather than the actual efficiency of 70 to 78 percent dictated for the convenience of the allottees. The difference between these two calculations would, for purposes of the allowances, be considered as the deficiency in firm energy.

The Secretary would determine how the allowance would be accomplished; i.e., (1) monetarily, if the incremental cost (fuel replacement cost of generating substitute energy) is less than the selling rate for power from the Upper Basin projects (which would be the case while Glen Canyon was reaching minimum power head), or (2) whether it might be better to compensate the Hoover Dam power contractors with kilowatthours through the interconnection of the two power systems. In the event of an allowance, the Hoover power contractors will continue to pay under their contracts in the same manner as if the amount of energy involved in the deficiency had been generated at Hoover.

Paragraph 6. This is a tie between the general principles and the operating criteria.

Paragraph 7. This sets forth the method whereby the minimum power head (elevation 3490), 6.1 maf available surface storage, would be gained in Glen Canyon. This would be done at the earliest practicable time without drawing Lake Mead below its rated head (elevation 1123) or 14.5 maf available surface storage.

Until elevation 3490 is reached, any water stored in Lake Powell can be released to maintain rated head (14.5 maf at elevation 1123) on the Hoover Powerplant; when Lake Powell reaches elevation 3490, the stored water cannot be released below that point; and in the process of reaching 3490, the release of water at Glen Canyon Dam will not be less than 1.0 maf/yr and 1,000 cubic feet per second (ft^3/s).

Paragraph 8. This provides the principle that the powerplants will be coordinated and integrated without being tied to a specific plan so as to produce the greatest practical amount of power and energy.

Paragraph 9. The decision to coordinate and integrate eliminates secondary energy generation at Hoover, unless a spill is imminent.

Paragraph 10. This permits an earlier cutoff date than the date when Glen Canyon storage has reached elevation 3700 or May 31, 1987, if the conditions warrant such action.

Paragraph 11. This provides that in the annual application of the flood control regulations to the operations at Lake Mead, available capacity in upstream reservoirs shall be recognized.

On February 9, 1960, Secretary of the Interior Seaton approved Reclamation's recommendation that the above proposal be submitted to the engineering committee and then to the States of the two Basins for comment. On February 12, 1960, the Department of the Interior issued the proposed general principles and criteria with a memorandum of explanation dated January 18, 1960.

D. Revised Principles

Comments and suggested modifications of the proposed principles were received from Congressional members and from Basin representatives at a series of meetings held in Las Vegas, Nevada, in March 1960; Los Angeles, California, in May 1960 and April 1961; Salt Lake City, Utah, in January 1961; and in Denver, Colorado, in May 1961. In a memorandum dated June 13, 1961, from the Commissioner of Reclamation to the Secretary of the Interior, the following review was made.

After evaluation of the comments it received, the Bureau of Reclamation revised its previously recommended principles.The most substantive revisions related to Principle 5, dealing with the allowance for a portion of the diminution in power generation at Hoover Dam. Principle 5 was revised so as to take into account the effect on the stream by impoundment of water in all the storage units in the Upper Basin; i.e., Glen Canyon, Flaming Gorge, Navajo, and Curecanti (see letter of January 3, 1962, from Colorado River Commission of Nevada to Secretary of the Interior Udall which advocated that change), but excluding the effects of evaporation from the surface of such reservoirs as part of the theoretical streamflow used in the formula for computing allowance. The Upper Basin Compact treats reservoir evaporation losses as a "consumptive use" and the Upper Basin believed such losses should not be accounted for in computing the amount of "adjustment" in Hoover firm energy generation. The computation of and provision for allowance would not apply to Navajo and Flaming Gorge until the filling operation starts at Glen Canyon.

Reclamation rejected a suggestion that an efficiency factor of 78 percent be used in computing Hoover basic firm energy, from which would be subtracted the energy actually generated at Hoover, adjusted to an efficiency factor of 83 percent, which would tend to minimize the deficiency. Also rejected was the use of the difference between actual generation and contract firm, which would tend to maximize the deficiency.

The Upper Basin States critized the use of the Upper Colorado River Basin Fund, established by the Act of April 11, 1956, in making the payments to meet the deficiency.

The Upper Basin was opposed to the use of storage project energy or storage project revenues to compensate the Hoover power contractors for energy deficiency during the filling period. They questioned the authority of the Secretary of the Interior to use such power output or revenues for that purpose and believed that the existence of the power contracts should not influence the Secretary in developing the operating criteria.

Senator Bennett of Utah criticized Principle 5 for the reasons that consumptive use of water is paramount and power is secondary; that there is no legal requirement in the Compact or Storage Project Act that the Upper Basin States make up Hoover power deficiencies; that the Hoover power contracts anticipated upstream development and a diminution in firm power production during the filling period; that the Lower Basin water and power users benefited by the 30-year delay in building dams in the Upper Basin; and that the Hoover power deficiency did not arise because of the filling of Glen Canyon but was partly due to decreased

streamflows (see Senator Bennett's letter to Secretary Udall dated March 6, 1961; see analysis thereof in Assistant Commissioner Bennett's memorandum to the Commissioner of Reclamation dated April 3, 1961; see letter from Governor Clyde of Utah, to Commissioner of Reclamation Dominy dated April 20, 1962; see letter from Senator Allott of Colorado to Secretary of the Interior Udall, dated April 25, 1961; and see letter from Senator Moss of Utah to the President dated May 1, 1961).

The Upper Basin felt that the use of their fund carried with it a responsibility on the Upper Basin for energy deficiencies at Hoover which the Upper Basin denied, and that the use of the fund might adversely affect availability of power revenues to aid in repayment of the costs of the Upper Basin participating projects (see extract of Minutes of Colorado Water Conservation Board dated January 11, 1961). Wyoming Senator Hickey's letter to the Secretary, dated August 17, 1962, questioned the authority to use the Upper Basin Fund as did Senator Moss's letter of July 11, 1961, to Secretary Udall which also suggested establishment of a Lower Colorado River Basin Fund so as to pool power revenues from Lower Basin powerplants in order to meet deficiency payments.

In a letter of July 21, 1960, to the Commissioner of Reclamation, the Upper Colorado River Commission stated its position that there is nothing in the Compact, or in any interpretation thereof, which requires the Upper Basin to compensate, in any manner whatsoever, Lower Basin power users for water legally withheld in the Upper Basin. Although the Commission felt that the general principles were more favorable to the Upper Basin than were the "Hydrologic Bases" (see Upper Colorado River Commision's Report of July 20, 1960), it nevertheless noted that water uses downstream from Hoover Dam and basic firm energy gneration at Hoover Dam are to be made whole at the expense of Upper Basin resources development; that construction of reservoirs, storage of water, and consumptive use of water in the Upper Basin were anticipated and were reasons for negotiating the Compact; and that Hoover Dam should be operated at an efficiency of 83 percent rather than the lower efficiency adopted for the convenience of the Lower Basin in order to use Hoover generators for peaking purposes.

In response, Reclamation disclaimed any intent to declare or infer any responsibility on the Upper Basin for deficiency in energy generation at Hoover and stated that the use of that fund for this purpose is based solely upon, and exercise of, Departmental responsibility in operating a project under its jurisdiction; and that the purchase of replacement energy by the Storage Project is comparable to an operating cost and is similar to the purchase of "firming energy" in years of low runoff. As to the second concern which, said Reclamation, is understandable in the event of less than average flows, provision was made in Principle 5 for reimbursement to the Upper Basin Fund by the Hoover power allottees for whatever monies are used from the fund for that purpose, but not for nonfirm or other energy from the Storage Project powerplants.

Notification of the Department's intent to secure reimbursement was to be accomplished through an additional Departmental regulation for generation and sale of power pursuant to the Boulder Canyon Project Adjustment Act which was to be an attachment to the general principles and criteria. The regulation would state that the rates to be charged for electric energy after 1987 would include a component to assure revenues in the fund to accomplish reimbursement. In Reclamation's opinion, any further action would require legislation.

It was also determined that interest would not be included in the reimbursement to the Upper Basin Fund. Further, Reclamation emphasized its intention to make minimum use of dollars, but maximum use of energy from Federal powerplants for required replacement, and not to use firm energy from Storage Project powerplants if such energy could otherwise be sold at firm power rates.

Reclamation also rejected a proposal that Lake Mead not be drawn down below elevation 1146 (17 maf available surface storage) at least during the time Lake Powell is filling to dead storage level. It felt no undue risk is run when elevation 1123 (14.5 maf) is made the minimum drawndown point; that the objective of gaining minimum power head at Glen Canyon (elevation 3490) in the earliest practicable time would otherwise be defeated; and that provision was already made in Principle 7 for not drawing Lake Mead below the rated head at Hoover Powerplant (elevation 1123).

Other revisions included were:

The official name "Lake Powell" was used in lieu of "Glen Canyon Reservoir."

In Principle 1, it was indicated that the principles and criteria might be affected by possible future acts of Congress.

Principles 2 and 10 were combined. Principle 2 was expanded to include Principle 10 which dealt with possible earlier termination of the principles and criteria, and provision made for consultation with both Upper and Lower Basin interests before termination for reasons other than attainment of either Lake Powell storage reaching elevation 3700 or May 31, 1987.

Principle 8 was shortened without changing the principle.

Principle 9 was revised to recognize the possibility that there might be some generation of secondary energy at Hoover Powerplant during the filling period.

Principle 11 became Principle 10.

The revised Principles and Criteria described in the Commissioner's memorandum of June 13, 1961, additional Regulation No. 1, and an explanation of "Proposed Procedures for Computing Deficiencies in Firm Power Generation at Hoover," were transmitted to all interested parties in both Upper and Lower Basins. On December 22, 1961, the Commissioner of Reclamation reported to the Secretary of the Interior that a review of the comments thereon provided no reason to make fundamental changes in the general principles and operating criteria proposed by the Commissioner on June 13, 1961.

However, the memorandum of December 22, 1961, stated Reclamation's awareness that no set of general principles and operating criteria could possibly fully satisfy all the diverse interests affected. It reiterated that Reclamation had proceeded on the basis of securing a practical approach to the problems of filling, rather than a legalistic approach, based on a reasonable exercise of Secretarial discretion. It then discussed the comments and suggestions received in response to the June 13, 1961, memorandum.

Principle 1. A question was raised as to whether acquiescence by a Hoover power allottee in the exercise by the Secretary of "reasonable discretion" in the operation of the Federal projects involved would invoke a legal liability on that power allottee in respect to power which it has contracted to supply from its share of Hoover power. Reclamation's answer was that contractual relationship between a Hoover power allottee and its customers are outside the realm of Secretarial responsibilities and hence the question was not pertinent to the general principles and criteria.

Principle 2. The suggestion was adopted that the filling criteria should not end automatically when Lake Powell reaches elevation 3700 unless Lake Mead is at or above elevation 1146. Another suggestion was also adopted that the Secretary give prior notice before terminating the filling criteria previous to the attaining of elevation 3700 at Lake Powell. A minimum of 1 year's notice was felt reasonable; i.e., the time required by the Hoover power allottees to make necessary arrangements to accommodate any effects on their operations a change in filling criteria might entail.

It was considered premature to attempt to prescribe postfilling operating rules with the filling criteria but the need was recognized for formulating them as far as possible in advance of the termination of the filling period.

The previous conclusion was affirmed that the application of the filling criteria begin on the date when Lake Powell is first capable of storing water since the effect of storage in any other of the Storage Project reservoirs upon Lower Basin riverflows would be nominal.

Principle 3. Reclamation declined to define in terms of legality and limitation phrases such as "net river losses," "regulatory wastes," and "diversion requirements of mainstream projects."

Principle 4. Reclamation declined to insert "or losses" after "uses," since it would presumably cover evaporation from Lake Mead. To do so would confuse the issue by introducing the aspect of replacing river losses (as distinguished from reservoir losses) for no apparent reason.

Principle 5. This was the heart of the solution to formulation of acceptable filling criteria and invoked the most perplexing problems. Reclamation rejected both the Upper Basin contention that it is under no obligation to make allowances for Hoover power deficiencies and the Lower Basin position that allowances for deficiencies in diminution of both energy and capacity at Hoover should be provided without reimbursement. It adhered to its previous solution as middle ground, based on an impartial appraisal of the issues and a product of judgment as to what constitutes a practical procedure.

Reclamation agreed as worthy of exploration an Upper Basin proposal that the Colorado River Development Fund be used either to make necessary replacement energy purchases or to reimburse the Upper Colorado River Basin Fund on a current basis. (A variation of this was later adopted in Section 502 of the Colorado Basin Project Act.)

Principle 8. Despite the desirability of maintaining rated head at both Hoover and Glen Canyon Powerplants, which could perhaps be an operating rule, Reclamation declined to include a requirement in the general principles that any water stored in Lake Powell above elevation 3400 should be subject to release to maintain rated head at Hoover. Likewise, a Lower Basin proposal was declined that the offsetting of Hoover impairment should have priority on Upper Basin power output to the extent the Secretary cannot find replacement energy for purchase. Reclamation was agreeable to devoting nonfirm energy to this purpose, but not firm energy.

E. Secretarial Approval of General Principles and Operating Criteria

On April 2, 1962, Secretary Udall approved Reclamation's recommendations that the general principles be approved, subject to whatever reconsideration may appear desirable after the Hoover power allottees comment on additional Regulation No. 1, and that the principles be transmitted to the Governors, Senators and Representatives of the Basin States, the Upper Colorado River Commission, the Hoover power allottees, and other interested parties.

F. Additional Regulation No. 1

By letter of April 4, 1962, the Commissioner of Reclamation requested the comments of the Hoover power contractors on additional Regulation No. 1, which provide for reimbursement of the Upper Colorado River Basin Fund after June 1, 1987, in that the rates to be charged for energy after 1987 would include a component to assure revenues in the fund to accomplish reimbursement of the Upper Colorado River Basin Fund. Comments were received from the following named six of the nine contractors. No comments were received from the cities of Burbank, Glendale, and Pasadena, California.

Arizona Power Authority: Declined to comment and urged discussion of the matters it previously raised in connection with the filling criteria for Lake Powell, particularly the lack of a sufficient basis for responsible evaluation of the effect of the filling criteria upon Hoover, Davis, and Parker interests.

California Electric Power Co.: Additional Regulation No. 1 is unfair in forcing the Hoover power contractors to pay for a power loss caused by the filling of Lake Powell. It contends this cost should be paid by the Upper Basin States. If, however, the Hoover contractors must stand the cost, the company prefers to see the funds repaid after 1987, but the monies used should be repaid without interest. Further, the Hoover allottees are being discriminated against by allowing Lake Mead to drop to 14.5 maf during the filling of Lake Powell to its highest elevation, rather than 17 maf; that the low elevation water content will decrease its kilowatt capacity and the energy available to each contractor; and that if an allowance is made by delivering energy to an affected Hoover contractor, it should be delivered at times needed, as determined by the contractor.

Colorado River Commission of Nevada: Questioned the necessity and/or the practicality of considering the proposed regulation at this time since it does not become effective until June 1, 1987.

The Metropolitan Water District of Southern California: Withheld its comments pending study of an alternative proposal to use the Colorado River Development Fund to make allowance for diminution in Hoover basic firm energy during filling period. Since the District has no generating facilities, it will be compelled to purchase substitute energy, which cost will presumably be greater than the contract cost of Hoover energy, so that its view is that the "incremental cost" of substitute energy will refer to the actual cost of such energy to the District at the time and in the quantity required for District operations. Therefore, it prefers substitute energy instead of monetary compensation.

City of Los Angeles: While it assumes that additional Regulation No. 1 contemplates reimbursement without interest, it prefers that the regulation state specifically that such reimbursement is to be without interest.

Southern California Edison Co: The provisions of Article 5 of the filling criteria and proposed Regulation No. 1 relative to reimbursement of the Upper Colorado River Basin Fund from charges for electrical energy to be made at the Hoover Powerplant subsequent to June 1, 1987, would not appear to be authorized by existing law but rather to be in conflict therewith.

It was Reclamation's opinion that the comments it received did not object to the issuance of additional Regulation No. 1, or did not offer substantive reasons opposing its issuance and, therefore, Reclamation recommended the Secretary's promulgation of the Regulation and its publication in the Federal Register.

G. Promulgation of Principles and Additional Regulation No. 1

The general principles and operating criteria, as approved April 2, 1962, were published in the Federal Register, 27 F.R. 6851, July 19, 1962.

Additional Regulation No. 1 was adopted by Secretary Udall on July 12, 1962, and published in the Federal Register, 27 F.R. 6850, July 12, 1962.

The texts thereof appear in appendices 602 and 603, respectively.

H. Closure of Glen Canyon Dam

The partial closure of Glen Canyon Dam was accomplished at 2 p.m. on March 13, 1963, at which time the Bureau of Reclamation's Lower Colorado Regional Office at Boulder City, Nevada, began computing the "deficiencies." At that time, Lake Mead held 22.3 maf of water at elevation 1188.2 but this dropped to 15.4 maf at the end of January 1964. As of September 30, 1963, the deficiency was about 75 million kWh. By the end of 1963, the elevation of Lake Powell was about 3410 (80 feet short of minimum power point (3490)) with a content of 3.1 maf and, in addition, the runoff forecasts for 1964 indicated another poor runoff year. Studies at that time showed that to avoid drawing Lake Mead below elevation 1123, it would be necessary to release in 1964 the water theretofore impounded in Lake Powell. (For a discussion of an engineering analysis of the risks involved in closing the gates of Glen Canyon, see the Chief Engineer's memorandum to the Commissioner of Reclamation dated August 14, 1963.) The gates were opened temporarily on March 26, 1964, to maintain elevation 1123 at Lake Mead (14.5 maf storage). This was done because the March 1, 1964, forecast of a poor runoff indicated too great a risk of substantial expense to the Upper Basin if the April-July runoff turned out to be substantially less than the then mean forecast of 4.7 maf (News Release - Interior, May 11, 1964). The determination to open the gates was in accord with the filling criteria of 1962, particularly Principle 7, which provided that Lake Mead would not be drawn down below elevation 1123.

Prior to the Secretary's action in opening the gates at Glen Canyon on March 26, 1964, the Governors of the four Upper Basin States in a joint letter of March 17, 1964, urged the retention of water in Lake Powell in order to start generation of energy by August 1, 1964, and stressed the need to arrive at a method of filling the minimum power pool at Glen Canyon at the earliest practicable date. The Upper Colorado River Commission actively explored with various utilities in the Upper Basin the possibility of obtaining energy to supply deficiencies in the Lower Basin in the event Lake Mead was drawn below elevation 1123. On March 25, 1964, the Colorado River Board of California protested the withholding of water in Lake Powell as did Governor Brown of California.

I. Modification of Filling Criteria - May 11, 1964

The median forecast of May 1, 1964, for April-July runoff was 5.1 maf. Hence, the Secretary announced on May 11, 1964, that storage of water would be resumed behind Glen Canyon Dam and that "the calculated risk...in resumption of storage is warranted...." The gates were again closed May 11, 1964, at which time the Secretary modified the 1962 filling criteria to reduce by 40 feet, from elevation 1123 (rated power head) to elevation 1083 (minimum power pool) the water level below which Lake Mead would not be drawn by reason of the accumulation of minimum power operating content in Lake Powell, 6.1 maf, and elevation 3490.

The Secretary provided certain conditions to be observed upon the resumption of filling operations at Lake Powell which caused Lake Mead to be drawn below elevation 1123. The most significant condition was that, in addition to the allowance for deficiencies in firm energy generation pursuant to the 1962 filling criteria, the United States would replace impairments in Hoover Powerplant capacity and energy available to the allottees which result from the lowering of Lake Mead below elevation 1123 by reason of storage of water in Lake Powell. The United States would also relieve the allottees of costs of extraordinary maintenance of the turbines and generators resulting from such lowering. Energy and capacity deficiencies resulting from operation below elevation 1123 were identified as impairment energy and impairment capacity. The cost of replacing the deficiencies in capacity and energy and the costs of extraordinary maintenance were to be charged to the

Upper Colorado River Basin Fund (Colorado River Storage Project) but were not subject to reimbursement by the Boulder Canyon Project as was the case for deficiencies in firm energy as determined pursuant to the 1962 filling criteria.

The foregoing was done in accordance with the principles set forth in the document entitled "Operation of Lake Mead Below Elevation 1123 by Reason of Resumption of Storage Operations at Lake Powell," approved by the Secretary of the Interior on May 11, 1964. The text thereof follows:

OPERATION OF LAKE MEAD BELOW ELEVATION 1123 BY REASON OF RESUMPTION OF STORAGE OPERATIONS AT LAKE POWELL

The "General Principles to Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead during the Lake Powell Filling Period (27 F.R. 6851, July 19, 1962)," herein referred to as the "Filling Criteria," provide that until Lake Powell attains minimum power operation level (about elevation 3490) any water stored in Lake Powell is to be available to maintain Lake Mead at elevation 1123 (rated head at Hoover Powerplant).

In order to resume filling operations at Lake Powell under runoff conditions which would necessitate drawing Lake Mead below elevation 1123, the Hoover allottees must be maintained in the same position that they would have been in had Lake Powell storage not been resumed. By so doing, water in Lake Mead may be drawn down below elevation 1123 consistent with the objectives of the Filling Criteria. The following conditions will therefore be observed effective upon announcement by the Secretary of the Interior:

1. Outflow from Lake Powell will be reduced to not less than 1,000 ft^3/s.

2. Under no circumstances will Lake Mead be drawn below a minimum power operation level of elevation 1083 as a result of storage of water in Lake Powell. Any storage in Lake Powell will be used to avoid drawing Lake Mead below elevation 1083.

3. In addition to the allowances for deficiencies in firm energy generation determined pursuant to the Filling Criteria, the United States will replace deficiencies in Hoover Powerplant capacity and energy available to the Hoover allottees which result from the lowering of Lake Mead below elevation 1123 by reason of storage of water in Lake Powell. The United States will also relieve the allottees of cost of extraordinary maintenance of the Hoover turbines and generators resulting from such lowering. Costs incurred by reason of this paragraph will be charged to the Upper Colorado River Basin Fund and will not be subject to reimbursement from the separate fund identified in Section 5 of the Act of December 21, 1928, or otherwise charged against the Boulder Canyon Project.

4. Until Lake Mead is returned to elevation 1123 and subject to condition 2 above, Lake Powell will be permitted to exceed minimum power operating level only to the extent inflow exceeds turbine capacity, or as required to assure operation at not less than minimum power operating level.

5. When actual runoff through the month of June becomes known, early in July, the likelihood of attaining minimum power operating at Lake Powell in calendar year 1964 will be reasonably determinable. A decision will be made at that time whether to continue storage at Lake Powell or to release water stored therein in order to raise the elevation of Lake Mead. In arriving at that decision, consideration will be given to a comparison of estimated costs to the Colorado River Storage Project and the decision will be made after consultation with appropriate interests of the Upper and Lower Colorado River Basins.

Releases from Lake Powell were held down to approximately 1,000 ft^3/s most of the time from March 13, 1963, the date of partial closure, to January 30, 1964. From that date to March 26, 1964, releases were increased to about 4,000 ft^3/s and again increased at that time to meet the requirements of 1.0 maf/yr in Principle 7 of the criteria and to maintain minimum Lake Mead active content at 14.5 maf (elevation 1123). Releases were again restricted to a minimum of 1,000 ft^3/s on May 12, 1964, by order of the Secretary at which time Lake Mead was slightly above rated power head elevation. Minimum power operating level (6.1 maf at elevation 3490) was achieved in Lake Powell on August 16, 1964, and the releases increased thereafter holding Lake Powell close to minimum operating level. Energy generation began September 4, 1964.

To attain a minimum power pool at Glen Canyon Dam, the flow at Lee Ferry was restricted to 2,520,000 acre-feet in water year 1963 and 2,427,000 acre-feet in water year 1964. (A table showing the historic flows at Lee Ferry for water years 1953-1976 appears at the end of Chapter VII on "Operating Criteria.")

Because of the tight water situation Secretary Udall on May 16, 1964, directed Lower Basin water users to reduce their water demands by 10 percent for the period of June through December 1964. It was anticipated this would save 400,000 to 500,000 acre-feet of water during the 1964 drought year. The Metropolitan Water District of Southern California was later exempted from this cutback. The Yuma County Water Users' Association, the Yuma Mesa and Bard Irrigation Districts attacked the legality of the cutback order but the Arizona Federal District Court upheld it.

The water surface elevation in Lake Mead dropped to elevation 1098.6 on August 31, 1964, to 1093.5 on September 30, 1964, and to a low of 1088.1 in December 1964. From that low, with favorable runoff in the spring of 1965, it was restored to rated power head elevation of 1123 on June 23, 1965, more than a year after the Secretary's decision to modify the Lake Powell filling criteria.

During June 1965, Lake Powell water surface rose from minimum power elevation of 3490 to about 3511 and the content increased about 1 maf (Annual Report, Colorado River Board of California, 1964-1965). By September 30, 1965, Lake Powell storage increased 2.25 maf over the storage on September 30, 1964, to a total of 8.64 maf at elevation 3530.

The following statistics are pertinent:

	LAKE MEAD		LAKE POWELL	
	Elevation	Content (Million acre-feet)	Elevation	Content (Million acre-feet)
Normal High water	1222	27.3	3700	27
Rated Head on Powerplant	1123	14.5	3600	15
Min. Power pool	1083*	10.7	3490	6.1
Nevada Pumps (Min. level)	1050	8.0		

*Elevation below which turbines vibrate, excessive cavitation takes place

Lake Powell, March 26, 1964
3,120,000 acre-feet

Lake Powell, May 8, 1964
2,576,000 acre-feet

Colorado River, Lee Ferry, April-July runoff forecast, May 1, 1964

Additional storage needed for minimum power head at Lake Powell, 3.6 million acre-feet

Minimum	3,600,000 acre-feet
Mean	5,100,000 acre-feet
Maximum	6,600,000 acre-feet

Note: With a recurrence of the lowest recorded precipitation during the last 50 years for May, June and July, the April-July runoff this year could be as low as 3,000,000 acre-feet.

J. Storage - Lake Powell and Lake Mead

The following table shows the active storage in Lake Mead and Lake Powell on September 30 (the end of the water year) following the March 13, 1963, initial closure of Glen Canyon Dam, the change in storage during the year, and the annual releases at Lee Ferry and from Lake Mead during the year.

			Unit 1,000 acre-feet				
	Active storage at end of year				Annual release from reservoirs		
Year ending September 30	Lake Powell[1]	Lake Mead[2]	Storage change during year Lake Powell	Lake Mead	Colo. River below Powell[3]	Colo. River below Mead[4]	Pump from Mead[5]
1964	4,214	11,628	+3,674	−5,745	2,414	8,234	27
1965	6,466	14,708	+2,252	+3,080	10,820	7,917	23
1966	6,423	15,004	− 43	+ 296	7,854	7,769	25
1967	6,360	*14,375	− 63	* + 265	7,797	7,832	27
1968	7,514	15,018	+1,154	+ 643	8,334	7,831	31
1969	9,708	16,131	+2,194	+1,113	8,823	7,986	34
1970	12,039	16,769	+2,331	+ 638	8,672	7,895	42
1971	13,609	16,886	+1,570	+ 117	8,591	8,233	40
1972	12,488	17,451	−1,121	+ 565	9,311	8,267	66
1973	17,284	20,176	+4,796	+2,725	10,110	7,937	77
1974	18,010	19,358	+ 726	− 818	8,266	8,847	86
1975	20,202	20,154	+2,192	+ 796	9,255	8,374	81
1976	19,640	20,022	− 562	− 132	8,482	8,320	91
1977#	16,143	20,205	−3,497	+ 183	8,211	7,562	90

* New capacity table in effect April 1, 1967.
[1] Excludes dead storage of 1,998,000 acre-feet.
[2] Excludes dead storage of 2,378,000 acre-feet (table of 1967).
[3] Colorado River at Lee Ferry.
[4] Colorado River below Hoover Dam.
[5] Total pumpage from Lake Mead.
\# Unpublished records, subject to correction.

K. Extent of Deficiencies and Impairment Energy Furnished

The following table shows the water releases from Hoover Dam, the actual power generation at Hoover Dam, the energy delivered to the Hoover power allottees, the computed power generation absent and with the filling of the Colorado River Storage Project reservoirs and the accumulated Hoover firm energy deficiencies caused by the accumulation of storage in the Upper Basin reservoirs. (The figures were compiled from the annual reports of the Colorado River Board of California and the Upper Colorado River Commission.)

RELEASES FROM HOOVER DAM AND ENERGY DELIVERY
TO HOOVER POWER ALLOTTEES
(1962-63 to 1974-75)

Operating Year June 1 - May 31	Releases from Hoover Dam (acre-feet)	Actual Power Generation Hoover Dam	Energy Delivered to Allottees	Computed Power Generation Absent Filling of CRSP Reservoirs	Computed Power Generation With Filling of CRSP Reservoirs	Accumulated Deficiency as of June
		((Millions of kWh))				
1962-63	8,752,000	3,638	3,654			46
1963-64	8,548,000	3,167	3,649			551
1964-65	7,782,000	2,584	3,721			1,680
1965-66	7,658,000	2,708	3,661	4,073	3,148	2,605
1966-67	8,152,000	2,963	3,670	4,079	3,368	3,316
1967-68	7,828,000	2,802	3,617	4,062	3,226	4,152
1968-69	8,014,000	2,944	3,638	4,059	3,367	4,844
1969-70	7,975,000	3,072	3,716	4,068	3,431	5,481
1970-71	8,144,000	3,123	3,652	4,018	3,482	6,033
1971-72	8,157,000	3,148	3,646	4,043	3,565	6,511
1972-73	7,869,000	3,072	3,612	3,979	3,466	7,024
1973-74	8,480,000	3,374	3,542	4,097	3,930	7,191
1974-75	8,653,000	3,426	3,538	4,006	3,895	7,312

Capacity and energy were purchased and delivered to the Hoover power allottees to replace the loss in capacity and energy at Hoover Powerplant due to operation of Lake Mead below 1123. This occurred during the period May 23, 1964, to June 22, 1965. During this period, 1,579,760 kilowattmonths of impairment capacity and 185,605,788 kWh of impairment energy (including losses) were purchased from non-Federal suppliers at a cost of $3,652,256 (paid for by the Upper Colorado River Basin Fund with no provision for reimbursement) and 152,755 kilowattmonths of capacity and 18,075,365 kWh of energy were supplied by the Storage Project.

L. Efforts to Change or Terminate Filling Criteria

Following the April 2, 1962, approval of the General Principles and Filling Criteria, several bills were sponsored in the 88th Congress by representatives of the Upper Basin States which would relieve the Upper Colorado River Basin Fund from payment for energy deficiencies at Hoover Dam. Those in the 88th Congress were S.2915, H.R.11686 and H.R.11847. They would have authorized making the monetary allowances from the receipts of the Colorado River Development Fund, which was set up by the 1940 Boulder Canyon Project Adjustment Act to receive $500,000 annually from Hoover Dam power revenues for use in further water resource development in the Basins. No action was taken by the 88th Congress on the bills.

The same proposals were introduced in the 89th Congress as H.R.397 on January 5, 1965, and S.935 on February 1, 1965. No action was taken on the bills (see Annual Report, Colorado River Board of California, 1964-65, page 23).

In 1968 during the negotiations leading up to the enactment of the Colorado River Basin Project Act dated September 30, 1968, the Upper Basin interests proposed termination of the filling criteria. The criteria were continued. Nevertheless, the efforts to terminate led to Section 502, which provided for reimbursement to

the Upper Colorado River Basin Fund for money "heretofore or hereafter" expended therefrom to meet deficiencies in generation at Hoover Dam during the filling period of storage units of the Colorado River Storage Project pursuant to the filling criteria. The text of Section 502 follows:

> "The Upper Colorado River Basin Fund established under section 5 of the Colorado River Storage Project Act (70 Stat. 107; 43 U.S.C. 620d) shall be reimbursed from the Colorado River Development Fund established by section 2 of the Boulder Canyon Project Adjustment Act (54 Stat. 774; 43 U.S.C. 618a) for the money expended heretofore or hereafter from the Upper Colorado River Basin Fund to meet deficiencies in generation at Hoover Dam during the filling period of storage units of the Colorado River Storage Project pursuant to the criteria for the filling of Glen Canyon Reservoir (27 Fed. Reg. 6851, July 19, 1962). For this purpose, $500,000 for each year of operation of Hoover Dam and Powerplant, commencing with fiscal year 1970, shall be transferred from the Colorado River Development Fund to the Upper Colorado River Basin Fund, in lieu of application of said amounts to the purposes stated in section 2(d) of the Boulder Canyon Project Adjustment Act, until such reimbursement is accomplished. To the extent that any deficiency in such reimbursement remains as of June 1, 1987, the amount of the remaining deficiency shall then be transferred to the Upper Colorado River Basin Fund from the Lower Colorado River Basin Development Fund, as provided in subsection (g) of section 403."

In 1969, during the formulation of the operating criteria pursuant to Section 602 of the Colorado River Basin Project Act, the Upper Basin interests again sought termination of the filling criteria through the exercise of the Secretary's option to terminate.

By memorandum of February 25, 1969, the Regional Director of the Bureau of Reclamation at Salt Lake City, Utah, recommended that the Commissioner of Reclamation concur with the Upper Basin position that the Upper Basin Fund be reimbursed for all expenditures to meet deficiencies and impairments in generation at Hoover Dam during the filling period of the storage units. This would include costs associated with operations at Lake Mead below as well as above elevation 1123. By memorandum of April 23, 1969, the Commissioner rejected that suggestion as inconsistent with the filling criteria.

On October 1, 1969, the Upper Colorado River Commission adopted a resolution requesting the Secretary of the Interior to discontinue the Hoover deficiency payments made from the Upper Colorado River Basin Fund. The Commission asked that this action be effective July 1, 1970, when the operating criteria were to be effective. The request was not granted.

A similar request for termination of the filling criteria was made in a letter of March 31, 1970, from the Governors of the four Upper Division States to the Secretary. The Chief Engineer's comments thereon were provided the Commissioner by memorandum dated April 7, 1970. As stated in the Secretary's response of June 8, 1970, to the Governors of the Basin States, the Department concluded to continue the filling criteria. However, the Secretary attempted to meet the objections of the Upper Basin States in part by stating that, except as limited by minor variations in marketing conditions, all energy to meet Hoover deficiencies in the future was expected to be purchased, and under Section 502 of Public Law 90-537, these costs would be repaid to the Upper Colorado River Basin Fund.

On February 27, 1971, the Upper Colorado River Commission passed a resolution that the Secretary reverse his 1970 decision to continue the filling criteria. The Secretary did not change that decision.

Again in 1975, the Upper and Lower Colorado Regional Offices of the Bureau of Reclamation drafted a notice which would terminate the filling criteria on the grounds that the combined active storage in Lake Powell and Lake Mead was essentially equal to 41 maf and that the intended purpose of the filling criteria had been satisfied. The notice was not adopted by the Department of the Interior and the filling criteria were continued as viable guidelines.

CHAPTER VII

OPERATING CRITERIA

A. Background

The "Operating Criteria" provided for by Section 602 of the Colorado River Basin Project Act was an outgrowth of conferences held by representatives of the Upper and Lower Basins which resulted in a new draft of Basin Project bill, H.R.4671, agreed upon by them on September 20, 1965. Among its new features was a provision that the Secretary of the Interior, in consultation with the seven Basin States and parties to contracts with the United States, develop long-range Operating Criteria for reservoirs on the Colorado River System.

The bill also provided for reimbursement to the Upper Basin Fund for money paid from the fund for Hoover Dam power deficiencies caused by the filling of Lake Powell and reiterated an earlier draft provision that Upper Basin rights to Colorado River water shall not be impaired by any temporary use of water in the Lower Basin. It did not, however, provide guidelines or an order of priorities for the release of water.

A major point of contention between the two Basins in the development of the Colorado River Basin Project Act were the details of the Operating Criteria that would govern the relationship of storage in Lake Powell to storage in Lake Mead. The Upper Basin's problem with respect to legislation to construct a Lower Basin project predicted, according to the Upper Basin, upon presently unused water apportioned to the Upper Basin is: how do the upstream States recapture their water when it will be needed for their own resource development, some of which is imminent (see page 49, Seventeenth Annual Report, Upper Colorado River Commission, September 20, 1965). The Upper Basin States were concerned that the operation of the reservoirs could be detrimental to their interests because of:

(1) Lack of specific operating procedures in the Filling Criteria for Lake Powell, promulgated by the Secretary of the Interior on April 4, 1962; e.g., the right of Upper Division States to accumulate hold-over storage; and

(2) Lack of official interpretation of certain provisions of the Colorado River Compact, particularly Article III, paragraphs (c), (d) and (e).

Article III(c) of the Compact provides that the Mexican Treaty obligation be met first out of surplus water and then by sharing the burden of any deficiencies equally between the Upper and Lower Basins.

Article III(d) of the Compact provides that the States of the Upper Division shall not cause the flow of the river at Lee Ferry to be depleted below 75 maf in any consecutive 10-year period.

Article III(e) of the Compact provides that the States of the Upper Division shall not withhold water and the States of the Lower Division shall not require the delivery of water which cannot reasonably be applied to domestic and agricultural uses.

The objective of Section 601 of H.R.4671, which initially provided for the Operating Criteria, was to avoid uncertainties caused by varying interpretations of the Compact and to provide for a sharing between Basins of the benefits of wet years and the burden of drawdowns during droughts. A new draft of bill was negotiated and tentative agreement reached on a bill entitled "Recommended Revision" of H.R.4671, dated February 22, 1966 (see pages 35-61, Eighteenth Annual Report of the Upper Colorado River Commission, September 30, 1966).

Hearings before the Subcommittee on Irrigation and Reclamation were held May 9-10, 1966. The bill under consideration approved by it, H.R.4671, Committee Print No. 19, dated April 25, 1966, included the following changes, among others, from the earlier September 30, 1965, draft.

The Secretary would promulgate criteria for coordinated long-range operation of reservoirs, such criteria to follow specified orders of priority in and release of water from Lake Powell. At the same time the Upper Basin rights to the consumptive use of water apportioned to that Basin by the Colorado River Compact would not be prejudiced or reduced by any use thereof in the Lower Basin.

As a result of negotiation, Section 601 of the House Committee approved bill contained a list of priorities to govern the storage of water in storage units of the Colorado River Storage Project and releases of water from Lake Powell. The priorites were:

(1) Releases in accordance with Article III(c) of the Compact;

(2) Releases in accordance with Article III(d); and

(3) Accumulation of storage in the Upper Basin not required for (1) and (2) and releases to meet uses specified Article III(e).

Compromise language was agreed upon in Section 601(b)(3) which would direct the Secretary, in determining the quantity of storage in Lake Powell "reasonably necessary" pursuant to the Compact, to consider all relevant factors, including, but not limited to, historic streamflows, the most critical period of record, and probabilities of water supply. Use of the probability approach was favored by the Lower Basin interests over a rigid rule curve proposed by the Upper Basin since, in the Lower Basin's opinion, the latter would require the maintenance of progressively larger quantities of holdover storage in Lake Powell at the expense of storage in Lake Mead as Upper Basin depletions increase, would limit the regulatory capability of Lake Powell, and possibly result in excessive spills in Lake Powell with a resultant loss of power production (see Annual Report, Colorado River Board of California, 1965-66, pages 11-13, and 29-30). This matter reemerged in the discussions preceding adoption of the Operating Criteria.

H.R.4671 discussed in 1966 did not leave the Rules Committee. The Pacific Northwest States opposed the possibility of exporting Columbia River water. "Save the Grand Canyon" campaigns were publicized. Administration support was lacking and Senate leaders wanted House approval before acting (see pages 41-46, Eighteenth Annual Report of the Upper Colorado River Commission dated September 30, 1966).

However, the Colorado River Basin Project Act, which contained priority language in Section 602 similar to that in H.R.4671, was signed by President Johnson on September 30, 1968 (see Appendix 1202 for text of Act).

B. Colorado River Basin Project Act - Section 602(a)

Section 602(a) of the Colorado River Basin Project Act dated September 30, 1968, 82 Stat. 900 (Public Law 90-537), required the Secretary of the Interior to propose "criteria for the coordinated long-range operation of the reservoirs constructed and operated under the authority of the Colorado River Storage Project Act, the Boulder Canyon Project Act, and the Boulder Canyon Project Adjustment Act." Section 602(a) further stated that the criteria make provision for the storage of water in the Upper Basin storage units and releases of water from Lake Powell in a listed order of priorities stated below. Section 602(b) directed that not later than January 1, 1970, the proposed criteria be submitted to the Governors of the seven Basin States and other interested parties for review and comment and that the Secretary adopt appropriate criteria not later than July 1, 1970. The text of Section 602(a) and the above-mentioned order of priorities follows:

"Sec. 602(a) In order to comply with and carry out the provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, and the Mexican Water Treaty, the Secretary shall propose criteria for the coordinated long-range operation of the reservoirs constructed and operated under the authority of the Colorado River Storage Project Act, the Boulder Canyon Project Act, and the Boulder Canyon Project Adjustment Act. To effect in part the purposes expressed in this paragraph, the criteria shall make provision for the storage of water in storage units of the Colorado River Storage Project and releases of water from Lake Powell in the following listed order of priority:

(1) Releases to supply one-half the deficiency described in Article III(c) of the Colorado River Compact, if any such deficiency exists and is chargeable to the States of the Upper Division, but in any event such releases, if any, shall not be required in any year that the Secretary makes the determination and issues the proclamation specified in Section 202 of this Act;

(2) Releases to comply with Article III(d) of the Colorado River Compact, less such quantities of water delivered into the Colorado River below Lee Ferry to the credit of the States of the Upper Division from other sources; and

(3) Storage of water not required for the releases specified in clauses (1) and (2) of this subsection to the extent that the Secretary, after consultation with the Upper Colorado River Commission and representatives of the three Lower Division States and taking into consideration all relevant factors (including,

but not limited to, historic streamflows, the most critical period of record, and probabilities of water supply), shall find this to be reasonably necessary to assure deliveries under clauses (1) and (2) without impairment of annual consumptive uses in the Upper Basin pursuant to the Colorado River Compact; *Provided*, That water not so required to be stored shall be released from Lake Powell: (i) to the extent it can be reasonably applied in the States of the Lower Division to the uses specified in Article III(e) of the Colorado River Compact, but no such releases shall be made when the active storage in Lake Powell is less than the active storage in Lake Mead, (ii) to maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell, and (iii) to avoid anticipated spills from Lake Powell."

Statements in House Report 1312, at pages 83, 84, 85 and 86, and in Senate Report 408, pages 62, 63, 64 and 65, deal with the Operating Criteria provisions (see also an "Analysis of Public Law 90-537, Colorado River Basin Project Act, Paul L. Bilhymer, General Counsel, Twentieth Annual Report of the Upper Colorado River Commission, dated September 30, 1968, pages 69-98).

C. Formulation of Operating Criteria

In October 1968, immediately following passage of the Colorado River Basin Project Act, field discussions were initiated by the Bureau of Reclamation to formulate a program for developing Operating Criteria. A Bureau Task Force, composed of representatives of the Denver, Salt Lake City, Boulder City and Washington offices, was created to act upon the matter.

Subsequent discussions on January 27-29, 1969, indicated there was no agreement among the States on the magnitude of the Upper Basin share of the Mexican Treaty obligation. It was agreed that appropriate rule curves be developed, assuming delivery of 8.25 maf at Lee Ferry in order to determine the quantity of storage required in the Upper Basin to permit deliveries required by Article III(c) and (d) of the Compact without curtailing Upper Basin use; that the reservoirs will be operated on the basis of runoff forecasts, but releases from Lake Powell would be scheduled so that the powerplant will not be bypassed absent a spill. Also discussed were the relationship of the Operating and Filling Criteria.

In February 1969, the Chief Engineer provided the Task Force with an initial draft of criteria.

The draft of Operating Criteria followed the Task Force discussion of the following items:

1. Period of record to use; e.g., 63 years, 1906-1968, inclusive;
2. Studies with a 2,500 ft^3/s and 3,000 ft^3/s Granite Reef Aqueduct;
3. Method of study—historic content of reservoirs on September 30, 1968, and three runoff sequences starting in 1969 as follows: 1908, 1938, and 1948;
4. Depletions in Upper Basin;
5. Virgin flow at Lee Ferry;
6. Demands at Lake Mead;
7. Operation of Upper Basin reservoirs, assuming that minimum power pool will be maintained at all reservoirs, and that 8.25 maf per year will be used as the minimum annual flow at Lee Ferry after CAP becomes operative; and
8. Operation of Lake Mead—not to be drawn below elevation 1083.

The initial draft of Operating Criteria referred to paragraphs 3, 4, 8 and 10 of the Filling Criteria approved April 2, 1962. It stated that the operating rules are not to be construed as an interpretation of the Upper Basin States obligation under the Mexican Treaty, and that it contemplated that the reservoirs not be drawn down below the minimum elevations needed for the generation of power. The criteria would rely on runoff-forecasts, and on storage in the reservoirs and the demands for water therefrom in both Basins. A rule curve would be prepared on the basis of the critical runoff sequence starting in water year 1953 to determine the live storage capacity needed in the Upper Basin to meet a delivery requirement at Lee Ferry of 8.25 maf without curtailing Upper Basin uses; that the powerplant not be bypassed; that, prior to CAP, downstream requirements below Hoover will be met and that, after CAP, releases from Hoover will vary with the end of year elevation of Lake Mead, so that, for example, if Lake Mead is between elevations 1083 and 1100, diversions to CAP will be reduced to 340,000 acre-feet per year.

In a joint letter to the Assistant Secretary dated June 11, 1969, the Lower Basin States urged that full consideration be given to all flow conditions, not just the low flows, and recommended an early meeting with the seven Basin States.

On July 11, 1969, Assistant Secretary Smith invited the Governors of the seven Basin States to designate representatives to meet with and assist the Department in the preparation of the Operating Criteria.

D. State-Federal Meetings

Representatives of the seven Basin States and the Department of the Interior met at the Denver Federal Center, Denver, Colorado, on July 25, 1969. The Bureau of Reclamation provided a draft document dated July 25, 1969, "...for review of basic data pertinent to the preparation of Operating Criteria...." This included, among other things, a bibliography of legal documents, a checklist of data and assumptions, Upper and Lower Basin depletion studies and water measurements, preliminary operation studies, and a draft of proposed Operating Criteria. The material was designed to elicit comments from the participants. In addition, a State-Federal Task Force was created to act on the criteria.

At a subsequent meeting held August 7, 1969, at Salt Lake City, the discussions covered the comments from the States on the material provided by the Department in the initial July 25, 1969, meeting at Denver. It also covered Lake Powell bank storage; reservations for flood control storage; estimates of Upper and Lower Basin depletions; definition of terms such as "excess," "surplus," and "spill"; an Upper Basin request that a specific release figure from Lake Powell not be used; e.g., 8.23 maf; a Lower Basin request that 8.25 maf was insufficient because of conveyance losses in the Mexican deliveries; and continuation of the Filling Criteria advocated by the Lower Basin and their termination urged by the Upper Basin so that the Upper Basin would be relieved of the deficiency payments (see Regional Director's memorandum to Files dated August 14, 1969; memorandum from Task Force Chairman to members dated August 28, 1969; and report of Executive Director, Upper Colorado River Commission, dated October 1, 1969).

At a meeting on October 30, 1969, at Salt Lake City, discussions centered on the various studies in the Report of the Committee on Probabilities and Test Studies; the drawdown of Lake Mead below elevation 1083 suggested by Arizona; the termination of the deficiency payments urged by the Upper Basin on the grounds that both Lake Mead and Lake Powell are above rated power head; the Lower Basin position that a rule curve was not needed; and the reiteration of the Upper Basin that the reference to the release of 8.3 maf was only because excess water was available and that it was not a firm obligation and did not define the Upper Basin's share of the Mexican Treaty obligation.

For the purpose of a briefing session at Washington, D.C., on November 3-5, 1969, it was stated that agreement of the Task Force members seemed possible on the following items in the draft of Operating Criteria:

(1) The criteria should be flexible and reexamined at intervals not to exceed 5 or 10 years.

(2) When Lake Powell storage is less than Lake Mead storage, the annual release from Lake Powell should be at a predetermined annual rate; e.g., about 8.8 maf in 1970-72, and not less than 8.23 maf after 1972. In the early years of the 10-year period of October 1962 through September 1964 (water years 1963 and 1964) when storage was underway at Glen Canyon Dam, the annual releases to Lake Mead were 2,520,000 and 2,427,000 acre-feet, respectively. To make up the total of 75 maf required by Article III(d) of the Compact for that 10-year period, releases greater than 7.5 maf had to be made in later years.

(3) When the content of Lake Powell is greater than that of Lake Mead, releases in addition to the above should be made from Lake Powell to "equalize" storage at Lake Powell and Lake Mead as of, for example, September 30 of each year.

(4) For the first 10 years, the demands for consumptive use in the Lower Basin require an estimated average annual release of 8.4 maf.

In view of the possibility of the above agreements, it was suggested that the criteria be viable for the first 10-year period during which experience would be gained on other issues; e.g., more precise determination of Lower Basin uses and losses; rule curve for retention of reserve storage in the Upper Basin reservoirs; and rule curve for release of water.

D.1 Upper Basin Views

At the briefing session at Washington, D.C., on November 3-5, 1969, the Upper Basin views were discussed. These included:

(1) Revision or termination of the Filling Criteria, which, by its terms, is within the Secretary's discretion, and particularly cancellation of the deficiency payments.

(2) Releases at Lake Powell above Compact minimum not to be construed as a precedent affecting the Upper Basin position respecting Treaty obligations and accounting for uses in the Lower Basin.

(3) Releases at Lake Powell in early years above Compact minimum not to be a precedent for future deliveries.

(4) A commitment that use of Upper Basin entitlement not be limited by criteria terms including probability applications.

(5) Upper Basin shortages not to be imposed by or result from criteria when Upper Basin uses are less than its entitlement.

(6) Lower Basin uses and losses not to affect Upper Basin operations.

(7) Criteria should be flexible.

(8) Unequal remaining active space at minimum power levels, in Lake Powell and Lake Mead.

(9) Economic advantages cannot be a factor in defining Operating Criteria.

(10) Effective date of criteria to be spelled out.

D.2 Lower Basin Views

Arizona's views stressed no minimum elevations should be established for Lake Mead—not even the 1050 elevation for the Southern Nevada Water Project; that power production should be subordinate to water demand; and minimum releases from Upper Basin of 8.4 maf rather than 8.25 maf.

California's views were that the Filling Criteria be continued, that no rule curve be used but that the Operating Criteria should be general and that if alternative choices are available, power production should be maximized pursuant to Section 7 of the Colorado River Storage Project Act. Nevada, in general, concurred with California's views.

The problems as seen by the Task Force Chairman were:

(1) How flexible to make the criteria? California stressed the need for flexibility and the difficulty of predicting future water conditions, although Public Law 90-537 required more than a statement of principles.

(2) Should Lake Mead be drawn down below elevation 1083 (10 maf storage), which is about the minimum level without incurring excessive turbine maintenance? Arizona said yes, while Nevada and California opposed this.

(3) Under what conditions should "surplus" water be released from Lake Mead for use in the Lower Basin above 7.5 maf? California favored a liberal rule on release of surplus water while Arizona seemed more restrictive.

(4) What rule curve should be used to accumulate storage in the Upper Basin reservoirs? Reclamation's initial draft of criteria used the lowest years of record (1953-1956); i.e., the so-called 98.4 percent probability. (The lowest critical period of record varies with the magnitude of Upper Basin depletion.) The critical period of record was then increased progressively to 12 water years, 1953-1964, then to 34 water years, 1931-1964. Other probability studies included the 98.4+ percent, which would protect the minimum power pool, as well as using no rule curve. The Upper Basin favored a high rule curve while the Lower Basin favored a low rule curve.

(5) What should be the minimum annual release from Lake Powell? The Upper Basin opinion is that 75 maf in any period of 10 consecutive years is the limit of their obligation to deliver water at Lee Ferry. However, in the early years before full development in the Upper Basin a greater release will be made for power generation. Therefore, they acquiesced to Reclamation's use of 8.23 maf minimum annual release, provided this figure is not construed to be an obligation of the Upper Basin.

(6) Do the "Filling Criteria" terminate upon application of the "Operating Criteria"? The Upper Basin was united that this be done. The Lower Basin was opposed.

E. California Draft

On November 17, 1969, California submitted to the conference participants its draft of Operating Criteria and an explanation thereof. This was modified slightly for clarification purposes by letter dated November 25,

1969. The California draft followed the format of Reclamation's initial draft and provided the model for the criteria later adopted by the Secretary.

The major points of the California draft included retention of the Filling Criteria until they terminate under their own terms; the ability of the Secretary to revise the criteria; no rule curve to be promulgated at this time since it did not impact the Upper Basin and would not be a factor for at least 20 years, but the Secretary would determine annually the quantities of storage to be maintained in the Upper Basin reservoirs; i.e., "the Section 602(a) Storage" and the factors relevant thereto; a minimum release of 8.23 maf per year when either the forecast total of Upper Basin storage is below that of the "602(a) Storage" or the active storage of Lake Powell is below that of Lake Mead; the 8.23 maf figure would not be a commitment that it did or did not include the amount needed to meet the Mexican Treaty obligation of the Upper Basin; releases greater than 8.23 maf would be made when the active storage of Lake Powell is above Lake Mead and the forecast Upper Basin storage exceeds the "602(a) Storage"; releases would not be made that would bypass the normal capacity of Glen Canyon Powerplant; prior to commencement of Central Arizona Project deliveries, all Lower Basin consumptive uses would be met and thereafter releases from Lake Mead would implement Article II(B) of the Decree in *Arizona* v. *California*; shortage conditions would become operative when the forecast for the September 30 elevation at Lake Mead is less than 1100 feet and if reduced to 1090 feet, releases at Lake Mead would be curtailed to the quantity of water released at Lake Powell; i.e., CAP would be reduced to municipal and industrial requirements.

F. Arizona Draft

On November 19, 1969, Arizona submitted its proposals for the Operating Criteria. They provided, among other things, for flexibility and formal review every 5 years; 8.7 maf of water (this was Arizona's estimate of sustainable yield from its studies) to be released from Lake Powell in any year that spill is not imminent when the forecasted September 30 active storage of Lake Powell is less than the forecasted September 30 active storage of Lake Mead; when the April-July runoff forecast indicates that the forecasted active storage in Colorado River Storage Project reservoirs on September 30 will be greater than the requirements for active storage to assure 8.7 maf to the Lower Basin while meeting Upper Basin annual consumptive uses without impairment, more than 8.7 maf would be released if needed to meet annual requirements of water from Lake Mead and to equalize active storage in Lake Powell and Lake Mead on September 30 of the current water year; and no bypass of Glen Canyon Powerplant.

It was also Arizona's position that the Filling Criteria should terminate on their own terms and all active storage in Lake Mead should be used to minimize Lower Basin shortages.

G. Nevada's Views

On November 21, 1969, Nevada filed its comments which paralleled those of California as to not using a rule curve, retention of the Filling Criteria, and no drawdown of Lake Mead below elevation 1090.

H. Upper Basin Comments

On November 19 1969, the Engineering Committee of the Upper Colorado River Commission provided its comments. It emphasized the need for storage of water in the Upper Basin to permit maximum use of its entitlement and to assure delivery of an average of 7.5 maf annually to the Lower Basin, but stressed that the use of water for power was subservient to its use for domestic and agricultural purposes. It also made the following specific position points:

(1) The Filling Criteria and "deficiency" payments must be terminated as they are detrimental to Upper Basin interests; that to May 30, 1969, the replacement of these deficiencies has depleted the Upper Colorado River Basin Fund by $44.5 million computing Glen Canyon energy transferred to Hoover power contractors at 3.0 mils/kWh, or $75 million if computed at 6.0 mils/kWh; that if the Filling Criteria are continued the Lower Colorado River Basin Fund should bear the cost of the "deficiencies" rather than the Upper Basin Fund.

(2) The application of "probabilities" must not unreasonably impair annual consumptive uses of water in the Upper Division States; that the existing studies assumed an unreasonably slow rate of growth in the Upper Basin and for that reason showed no shortages in the Upper Basin.

(3) The delivery of water to the Lower Basin shall in no manner be "categorized" for satisfaction of the Mexican Treaty. With 8.23 maf of annual releases and an allowance of 20,000 acre-feet of inflow between Lake Powell and Lee Ferry (Paria River), the Lee Ferry flow would be 8.25 maf; this also happens to be the total of 7.5 maf plus 750,000 acre-feet (the annual average of 75 maf in 10 years plus one-half of the 7.5 maf Mexican Treaty water). Thus, future operators could mistakenly relate these figures to Articles III(c) and (d) of the Compact. Unless there is early reliable augmentation of the water supply in the river system, the Upper Division will have to seek an accounting of all Lower Basin water uses and a determination of each Basin's responsibility for filling the Mexican Treaty burden; i.e., a lawsuit.

(4) Reservoirs of the Upper and Lower Basins should be operated on a comparable basis. It questioned the uses of elevation 1083 for Lake Mead instead of its "minimum power pool" which is at elevation 895.

(5) The Upper Division States have an interest in the determination of consumptive uses and losses in the Lower Basin.

(6) Certain words used in the criteria need to be defined; e.g., "excess," "surplus," and "spill."

(7) "Flexibility" in the criteria is needed.

(8) The date of commencement of operations under the criteria should be specified.

(9) The date each year on which water stored in Lake Powell and Lake Mead will be equalized should be specified in the criteria.

(10) Precedents involving Upper Division obligations must not become established under the Operating Criteria; e.g., unrealistically slow rate of water resource development in the Upper Basin and a lower ultimate consumptive use than the Upper Division States believe is attainable.

I. Other Comments

On December 1, 1969, California filed written comments on the major issues; e.g., the Filling Criteria should continue; that Congress so intended in passing Section 502 of Public Law 90-537 which provides for repayment to the Upper Colorado River Basin Fund for moneys "heretofore or hereafter" expended therefrom to meet the Hoover deficiency payments; there is no conflict between the Operating Criteria and the storage portion of the Filling Criteria; that no rule curve is needed and, if used, should be based on a "90.5 percent probability" rather than a "98.4+ percent probability," a most extreme critical period of record; that Section 602(c) of the Basin Project Act states that Section 7 of the Colorado River Storage Project (CRSP) Act shall be administered in accordance with the Operating Criteria and Section 7 states that the CRSP power facilities are to be operated in conjunction with other Colorado River powerplants so as to produce the greatest practicable amount of power and energy which is not consistent with use of a high rule curve; and dealing with releases from Lake Mead in excess of 7.5 maf and releases under shortage conditions.

I.1 Final Task Force Meeting

On November 24, 1969, the participants met at Denver, Colorado, and discussed the positions advanced by each. The discussion centered on the operational studies; the drawdown of Lake Mead below elevation 1090; the need for a rule curve to govern storage in the Upper Basin reservoirs; continuation of the Filling Criteria and the impact on the Upper Basin of the deficiency payments (see Report of Task Force, Chairman J. R. Riter, dated December 12, 1969, to all participants). The Task Force had completed its assignment as of that date.

J. Secretary's Proposed Criteria

On December 16, 1969, Secretary Hickel transmitted the Department's proposed Operating Criteria to the Governors of the seven Basin States. His letter reviewed the purpose of the criteria; i.e., to provide for

storage of water in Upper Basin reservoirs and Lake Mead and the release of water therefrom in accordance with Section 602 of Public Law 90-537, explained the procedures to be followed thereunder and invited comments prior to April 1, 1970.

Among the principal points in the Secretary's letter was that the Secretary would determine each year the quantity of water reasonably necessary to be retained in Colorado River Storage Project reservoirs; i.e., Section 602(a) Storage, and dropping the use of a rule curve favored by the Upper Basin which would, in essence, establish predetermined quantities of water to be retained in storage, since the operation studies indicated that the rule curve would not govern operations for many years. The criteria provided for an estimated minimum annual release of 8.23 maf as an objective, but without in any way intending to prejudice the position of either the Upper or Lower Basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact or the Colorado River Basin Project Act. No specific operating elevations were established for Lake Mead. Filling Criteria is a matter separate and apart from the issuance of the Operating Criteria and would be made prior to adoption of the Operating Criteria and a decision would be made by July 1, 1970. Comments thereon were requested.

K. Governor's Comments

In a joint letter of March 13, 1970, the Governors of California, Arizona, and Nevada expressed general agreement with the Secretary's proposed criteria, although suggesting modifications in certain provisions. Nevada's comments dated March 27, 1970, California's comments dated March 30, 1970, The Metropolitan Water District's comments dated March 30, 1970, Arizona's comments dated March 30, 1970, and those of Southern California Edison Company dated April 1, 1970, urged retention of the Filling Criteria.

The Hoover power allottees assert they have a cause of action against the United States for impairment of their power contracts due to withholding of water to fill Upper Basin reservoirs. The damages would be for (1) diminution in firm energy, (2) diminution in secondary energy, and (3) loss of power head; i.e., generating capacity. California contended that Section 502 of Public Law 90-537 settled the deficiency question and that the Filling Criteria and Operating Criteria are not incompatible.

In a joint letter of March 31, 1970, the Governors of Colorado, New Mexico, Utah, and Wyoming provided their comments as well as those of the Upper Colorado River Commission. It included and emphasized a strong recommendation that the 1962 Filling Criteria be terminated and repeated the reasons therefor presented in the report of the Upper Colorado River Commission Engineering Committee of November 19, 1969, *infra*, together with a summary of those arguments, and suggested changes in several provisions of the proposed Operating Criteria. These included the use of 8 maf as the objective rather than 8.23 maf; urged the use of the high rule curve of 98.4+ to assure the filling of Upper Basin reservoirs to adequate storage levels; and the deletion of "contracts" as part of the "Law of the River" since its inclusion would upgrade Hoover Dam water and power contracts to the stature of an Act of Congress.

On May 14, 1970, California filed a Rebuttal to the March 31, 1970, comments and recommendations of the Upper Basin States. The Rebuttal dealt with each of the reasons advanced by the Upper Basin States for the proposed early termination of the Filling Criteria as advocated by the Upper Basin States and with the suggested modifications of the several provisions of the proposed Operating Criteria. On May 25, 1970, Arizona provided its comments. On June 5, 1970, Nevada commented on the Upper Basin views.

L. Adoption of Operating Criteria

On June 8, 1970, after evaluation of the comments of the Upper and Lower Basin States, Secretary Hickel adopted the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs" and transmitted to the representatives of the Governors of the seven Basin States a copy of the Operating Criteria. A detailed explanation of decisions on each of the suggestions and recommendations of the States was provided on June 9, 1970, by the Commissioner of Reclamation.

The Secretary's letter acknowledged the contribution of the State-Federal Task Force. He stated that in his judgment the contents of Lake Powell and Lake Mead did not warrant termination of the Filling Criteria at this time. He recognized that a major objection by the Upper Basin has been the use of CRSP generated energy

to replace Hoover deficiencies with the resultant impact on the Upper Colorado River Basin Fund, and advised that under current water and power marketing conditions, all Colorado River Storage Project generation is required to meet firm energy obligations of the United States and all energy needed to satisfy Hoover deficiencies must be purchased and that, except for minor variations, this operating condition is expected to continue. The net result is that increased revenues will accrue to the Upper Colorado River Basin Fund from power sales, and money expended from that fund to replace Hoover deficiencies will be reimbursed from the Colorado River Development Fund pursuant to Section 502, Public Law 90-537. He further advised that, in accordance with the provisions of the Filling Criteria, the modification thereof dated May 11, 1964, and consistent with said Section 502, the Upper Colorado River Basin Fund will not be reimbursed for costs incurred in connection with impairment of capacity and energy resulting from the drawdown of Lake Mead below elevation 1123 feet incident to the attainment of minimum power pool in Lake Powell; and that neither will there be reimbursement for energy furnished from Colorado River Storage Project generation utilized in meeting energy deficiencies and impairments in Hoover generation.

The letters from the Governors of the Lower and Upper Basins dated March 13 and March 31, 1970, respectively, proposed conflicting changes in the Secretary's draft of Operating Criteria. The resolution of some of the proposals, as was noted in the detailed explanation to all the interested parties from the Commissioner of Reclamation dated June 9, 1970, follows:

In paragraph 1, a Lower Basin suggestion was adopted that the criteria apply to the storage reservoirs in the Colorado River Basin (rather than the "Upper" Basin) and "consonant" be changed to "*consistent* with applicable Federal laws ..." The Secretary did not adopt an Upper Basin suggestion to emphasize in this paragraph that the criteria are to assure that Upper Basin consumptive uses will not be impaired because of failure to store sufficient water to make deliveries under Sections 602(a)(1) and (2) of Public Law 90-537, since the point was more appropriately covered later. The Secretary did delete a reference to "contracts" in the itemization of the "Law of the River" as proposed by the Upper Basin.

In the second paragraph an Upper Basin suggestion was adopted to stress participation by State representatives in the review of the criteria.

An Upper Division proposal was adopted that the reference to "water quality" in Subarticle I(2) be revised to "water quality control."

An Upper Basin proposal was rejected that a new subdivision be added to provide that one of the factors to be considered by the Secretary in determining the quantity of 602(a) Storage would be the maximum production of firm power and energy in conformity with Section 7 of Public Law 84-485.

An Upper Basin proposal was rejected which advocated the immediate application of the 98.4+ percent rule curve to determine the amount of storage needed in the Upper Basin reservoirs to meet the requirements of Section 602(a) of Public Law 90-537. This was because factors other than a rule curve will, for many years, govern the storage of water in the Upper Basin reservoirs.

A portion of an Upper Basin proposal was adopted in that specific reference was made in Subarticle II(5) that releases from Lake Powell shall not prejudice the position of either Basin with respect to required deliveries at Lee Ferry pursuant to the Compact.

An Upper Basin proposal was adopted that the definition of "surplus" state it has no reference to the term "surplus" in the Colorado River Compact.

M. Provisions of the Criteria

The criteria provide that the Secretary may modify the criteria from time to time and will sponsor a formal review at least every 5 years.

Article I provides for an annual report on January 1, 1972, and on January 1 of each year thereafter, describing the actual operation under the adopted criteria for the preceding compact water year and the projected plan of operation for the current year, which shall reflect appropriate consideration of the uses of the reservoirs for all purposes.

Article II(1) 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 that year to be in storage as required by Section 602(a) of Public Law 90-537 (hereinafter "602(a) Storage") and lists the factors to be considered in arriving at

that determination; e.g., historic streamflows, the most critical period of record, probabilities of water supply.

Article II(2) provides that if, in the plan of operation, either:

(1) The Upper Basin Storage Reservoirs' active storage forecast for September 30 of the current year is less than the quantity of Section 602(a) Storage determined by the Secretary under Article II(1) for that date; or

(2) The Lake Powell active storage forecast for that date is less than the Lake Mead active storage forecast for that date;

the objective shall be to maintain a minimum release of water from Lake Powell of 8.23 million acre-feet for that year. However, releases for the years ending September 30, 1971, and 1972, may be greater than 8.23 maf if necessary to deliver 75 maf at Lee Ferry for the 10-year period ending September 30, 1972.

Article II(3) provides that if, in the plan of operation, the Upper Basin Storage Reservoirs' active storage forecast for September 30 of the current water year is greater than the quantity of 602(a) Storage determination for that date, water shall be released annually from Lake Powell at a rate greater than 8.23 maf/yr to the extent necessary to accomplish any or all of the following objectives:

(1) To the extent it can be reasonably applied in the Lower Division States to the uses specified in Article III(e) of the Colorado River Compact, but no such releases shall be made when the active storage at Lake Powell is less than the active storage in Lake Mead;

(2) To maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell; and

(3) To avoid anticipated spills from Lake Powell.

Article II(4) provides that in the application of Article II(3)(b), the annual release will be made to the extent that it can be passed through Glen Canyon Powerplant when operated at its available capability. Any water retained in Lake Powell to avoid bypass of water at the Glen Canyon Powerplant will be released through the powerplant as soon as practicable to equalize the active storage in Lake Powell and Lake Mead.

Article II(5) provides that releases from Lake Powell pursuant to these criteria shall not prejudice the position of either the Upper or Lower Basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact.

Article III deals with the operation of Lake Mead and Subarticle III(1) provides for pumping therefrom or releases to meet:

(1) Mexican Treaty obligations;

(2) Reasonable consumptive use requirements of mainstream users in the Lower Basin;

(3) Net river losses;

(4) Net reservoir losses; and

(5) Regulatory wastes.

Article III(2) states that until such time as mainstream is delivered by means of the Central Arizona Project, the consumptive use requirements of Article III(1)(b) will be met.

Article III(3) provides that after commencement of delivery of mainstream water by means of the Central Arizona Project, the consumptive use requirements of Article III(1)(b) will be met to the following extent:

(1) Normal: to satisfy 7.5 maf of annual consumptive use in accordance with the Decree in *Arizona* v. *California*, 376 U.S. 340 (1964).

(2) Surplus: the Secretary shall determine when water in quantities greater than "Normal" is available for either pumping or release from Lake Mead pursuant to Article II(b)(2) of the Decree in *Arizona* v. *California* after consideration of all relevant factors, including, but not limited to:

(a) The requirements stated in Article III(1) of these Operating Criteria;

(b) Requests for water by holders of water delivery contracts with the United States, and of other rights recognized in the Decree in *Arizona* v. *California*;

(c) Actual and forecast quantities of active storage in Lake Mead and the Upper Basin Storage Reservoirs; and

(d) Estimated net inflow to Lake Mead.

(3) Shortage: the Secretary shall determine when insufficient mainstream water is available to satisfy annual consumptive use requirements of 7.5 maf after consideration of all relevant factors, including, but not limited, to:

(a) The requirements stated in Article III(1);
(b) Actual and forecast quantities of active storage on Lake Mead;
(c) Estimate of net inflow to Lake Mead for the current years;
(d) Historic streamflows, including the most critical period of record;
(e) Priorities set forth in Article II(a) of the Decree in *Arizona* v. *California*; and
(f) The purposes stated in Article I(1) of these Operating Criteria.

The shortage provisions of Article II(B)(3) of the Decree shall thereupon become effective and consumptive uses from the mainstream shall be restricted to the extent determined by the Secretary to be required by Section 301(b) of Public Law 90-537.

Article IV is entitled "Definitions" and provides, in addition to the definitions in Section 606 of Public Law 90-537, that:

(1) "Spills," as used in Article III(3)(c) herein, means water released from Lake Powell which cannot be utilized for project purposes, including, but not limited to, the generation of power and energy;

(2) "Surplus," as used in Article III(3)(b) herein, is water which can be used to meet consumptive use demands in the three Lower Division States in excess of 7.5 maf/yr but is not to be construed as applied to the term "surplus" in the Colorado River Compact;

(3) "Net inflow to Lake Mead," as used in Article III(3)(b)(iv) and (c)(iii) herein, represents the annual inflow to Lake Mead in excess of losses from Lake Mead;

(4) "Available capability," as used in Article II(4) herein, means that portion of the total capacity of the powerplant that is physically available for generation.

The Operating Criteria were published in Volume 35, Federal Register No. 112, Wednesday, June 10, 1970, at pages 8951 and 8952 and appear in Appendix 701.

The Department of Interior's explanation of decisions on the suggestions and recommendations of the Upper and Lower Basin States, dated June 9, 1970, appears in Appendix 702.

N. Operations Under Operating Criteria

A draft copy of the Secretary's first annual operating report entitled "Operation of the Colorado River, 1971-1972" circulated for review and comment, used a method of computing Upper Basin reserve storage required by Section 602(a) of Public Law 90-537 in order to meet Compact deliveries during the most critical dry period on the Colorado while maintaining minimum power pools in Upper Basin reservoirs. However, following receipt of comments, the final report avoided the issue of determining a numerical value for Section 602(2) storage by stating that "the accumulation of '602(a) Storage' is not the criterion governing the release of water during the current year" (Annual Report 1971—Colorado River Board of California).

This finding was repeated in the Second through Eighth Annual Reports.

By way of illustrating operations under the Operating Criteria, the fifth annual report of the Secretary to the Congress and to the Governors of the Colorado River Basin States in 1976 stated that water delivered to the Lower Basin at Lee Ferry was 9,274,000 acre-feet and 87,212,000 acre-feet for the 1-year and 10-year periods, respectively, ending September 30, 1975. Releases and diversions of 8,453,000 acre-feet from Lake Mead were made during the 1975 water year to satisfy all downstream requirements, including those of Mexico.

Because the projected 1975 end-of-year active storage in Lake Powell would exceed the active storage in Lake Mead with a minimum release, an additional 1,024,000 acre-feet was released from Lake Powell to equalize storage in Lake Mead.

The projected operations for water year 1976 contemplated a total release of 9,606,000 acre-feet from Lake Powell to satisfy storage equilization requirements. That, plus the flow of the Paria River, will result in the delivery to the Lower Basin at Lee Ferry of about 9,625,000 acre-feet.

The Secretary's Fifth Annual Report concluded that the 602(a) Storage forecast for September 30, 1975, on the basis of average runoff, exceeds the quantity required to protect expected future uses of water in the Upper Basin and, therefore, the releases from Lake Powell were projected to be above the minimum of 8.23 acre-feet in order to equalize storage in Lake Powell and Lake Mead (see Commissioner of Reclamation's memorandum of January 13, 1976, to the Secretary through the Assistant Secretary, Land and Water Resources).

On June 9, 1975, the Department requested the comments of the Basin States and interested parties on his formal 5-year review of the Operating Criteria. Notice of the review was published in the Federal Register on July 7, 1975, Volume 40, page 28499.

On January 20, 1976, the Department of the Interior announced that the criteria established in 1970 for operation of the Colorado River reservoirs would be continued without change. This determination was announced after a review of the operations was made in cooperation with the Governors of the Basin States and other interested entities (see Interior News Release, January 20, 1976, Lower Colorado Region).

For the 1977 operating year, because of prospects for low runoff; i.e., inflow to Lake Powell during April-July of 2.2 maf or 28 percent of normal, Lake Powell releases were set at 8.23 maf as compared to the 9.2 maf release under normal conditions.

As stated in the Secretary's Eighth Annual Report on the Operation of the Colorado River, issued in February 1979, "...the plan of operation during the current year (1978-1979) is based on a minimal release of 8,230,000 acre-feet of water from Lake Powell...." However, because of anticipated high runoff in this water year, greater releases may be expected.

Storage in Lake Powell on September 30, 1978, was 4.3 maf less than the storage in Lake Mead as of that date.

O. Ancillary Problems

Among the ancillary problems posed by the Operating Criteria were the effect of fluctuations in Lake Mead on the bass spawning season and on boating. Operations under the criteria, conversely, were affected by such matters as the Rainbow Bridge litigation and the 1974 reductions in water orders of The Metropolitan Water District of Southern California. The latter also impacted the production of power and energy.

The active storage in Lakes Mead and Powell for 1970 and subsequent years appears in Chapter VI - Filling Criteria, part J.

A table showing actual historic flow at Lee Ferry for water years ending September 30, 1953, through September 30, 1977, follows:

(See page 41, Twenty-Ninth Annual Report of the Upper Colorado River Commisison, September 30, 1977.)

HISTORIC FLOW AT LEE FERRY
1953-1977

Unit: 1,000 acre-feet

1	2	3
Water year Ending Sept. 30	Historic Flow	Progressive 10-year Total
1953	8,805	
1954	6,117	
1955	7,308	
1956	8,750	
1957	17,337	
1958	14,259	
1959	6,756	
1960	9,193	
1961	6,674	
1962[1]	14,785	99,984
1963[2]	2,520	93,699
1964[3]	2,427	90,009
1965	10,835	93,536
1966	7,870	92,656
1967	7,823	83,142
1968	8,358	77,241
1969	8,850	79,335
1970	8,688	78,830
1971	8,607	80,763
1972	9,331	75,309
1973	10,141	82,930
1974	8,274	88,777
1975	9,275	87,217
1976	8,494	87,841
1977	8,233	88,251

[1]Storage in Flaming Gorge and Navajo Reservoirs began in 1962
[2]Storage in Glen Canyon Reservoir began in 1963
[3]Storage in Fontenelle Reservoir began in 1964

CHAPTER VIII

ARIZONA v. CALIFORNIA

A. Background of Litigation

The subject litigation developed from the efforts of Arizona to obtain Congressional authorization of the Central Arizona Project (CAP).

In 1944 Arizona contracted with the Bureau of Reclamation for a $400,000 cooperative investigation of the means for utilizing Colorado River water in Arizona. A plan for a CAP was developed therefrom and a Bureau of Reclamation report was submitted to the Secretary of the Interior in December 1947. On September 16, 1948, the Secretary of the Interior transmitted to the Congress the Bureau of Reclamation's report which concluded that a proposed CAP, designed to transport water from the Colorado River to an area in central Arizona, was feasible from both an engineering and a financial point of view. However, the Secretary of the Interior's letter of transmittal warned that if Arizona's claims to mainstream water were not well founded, as was contended by California, then "there will be no dependable water supply available from the Colorado River for this diversion."

Congressional consideration of the CAP began in the 78th Congress when hearings were held on S.Res.304. Further hearings were held in 1945 during the 79th Congress on similar bills but no action was taken. In the 80th Congress in 1947 hearings were held on S.1175 to authorize the Bridge Canyon Project, later called the Central Arizona Project, but again no action was taken. In the 81st Congress in 1950 the Senate passed S.75 but no bill was reported by the House Committee. In the 82nd Congress the Senate passed S.75 on June 5, 1951. The House Interior Committee also held hearings and on April 18, 1951, the House Interior and Insular Affairs Committee adopted a resolution providing that consideration of further bills relating to the Arizona Project

> "...be postponed until such time as use of the water in the lower Colorado River Basin is either adjudicated or binding or mutual agreement as to the use of the water is reached by the States of the Lower Colorado River Basin" (House Report No. 1312, April 24, 1969, 90th Congress, 2nd Session, page 29).

B. Suit by Arizona

Suit was initiated by Arizona on August 13, 1952, by filing a motion in the Supreme Court for leave to file a bill of complaint against the State of California and seven public agencies of the State. The public agencies are Palo Verde Irrigation District, Imperial Irrigation District, Coachella Valley County Water District, The Metropolitan Water District of Southern California, the City of Los Angeles, the City of San Diego, and the County of San Diego.

On January 19, 1953, the motion, unopposed, was granted (344 U.S. 919). "The complaint invoked the original jurisdiction of the (Supreme) Court under Article III, Section 2, Clause 2 of the Constitution. It alleged that pursuant to the Colorado River Compact and the Boulder Canyon Project Act Arizona was entitled annually to a certain quantity of water from the Colorado River System. It further alleged that various claims asserted by the defendants adversely affected the rights asserted by Arizona and that unless and until such rights were confirmed various existing projects in Arizona could not be operated at present levels and prospective projects could not be financed and constructed. Arizona requested, *inter alia*, that her title to the annual beneficial consumptive use of 3,800,000 acre-feet of water of the Colorado River System be forever confirmed, that title of the State of California to the annual beneficial consumptive use of Colorado River System water be forever fixed at and limited to 4,400,000 acre-feet, and that the defendants be forever enjoined from asserting claims inconsistent with Arizona's title so confirmed" (see Report of Special Master, December 5, 1960, pages 1 and 2).

The United States, pursuant to leave granted, intervened (344 U.S. 919 (1953)) as did Nevada (347 U.S. 985 (1954)).

After pleadings were exchanged among the parties, the Court, on June 1, 1954, appointed George I. Haight, Esq., of Chicago, Illinois, as Special Master. The Order directed him to find the facts specially and state separately his conclusions of law thereon and to submit them to the Court together with a draft of a recommended decree.

B.1 Upper Basin Joinder

California moved to have Colorado, New Mexico, Utah, and Wyoming joined as necessary parties. The motion was denied as to Colorado and Wyoming and granted to join Utah and New Mexico only to the extent of their capacity as Lower Basin States (350 U.S. 114 (1955)). On August 13, 1958, Arizona offered amended pleadings, which were intended to conform the pleadings to the proof and to state legal theories different from those espoused in the original pleadings. The Special Master decided it was unnecessary to receive the amended pleadings since Arizona would not be prejudiced by their rejection (Special Master's Report, page 136). Statements of Position were requested by the Special Master in order to clarify the respective contentions.

B.2 Special Master Appointed

On October 10, 1955, Judge Simon H. Rifkind was appointed Special Master *vice* George I. Haight, deceased. On June 14, 1956, the trial was begun in the United States Courthouse at San Francisco, California. In the course thereof, 106 witnesses were heard. The transcript of their testimony occupies about 22,500 pages. Thousands of exhibits were received in evidence. In addition, during a recess, depositions were taken at Silver City, New Mexico and at Reserve, New Mexico, at which 234 witnesses were heard. The deposition transcripts consist of 3,742 pages.

The trial was concluded on August 28, 1958. On July 1, 1959, the matter was finally submitted for consideration. On May 5, 1960, a draft report was circulated among the parties by the Special Master. Comments were submitted by all the parties except Utah and oral argument was held on the Draft Report and recommended decree.

C. Special Master's Report - December 5, 1960

C.1 Issues

According to the Special Master's Report to the Supreme Court dated December 5, 1960, the action presented a number of different but related controversies among the parties. First, there is the mainstream controversy, involving the three Lower Basin States. Arizona claimed the right to use 2.8 maf in the Colorado River plus one-half of "surplus" based on a mandatory division of the water made by Congress in Section 4(a) of the Boulder Canyon Project Act. Since existing projects in Arizona consume less than half of this amount Arizona expected to use most of the then uncommitted water which she claims for a new project called the Central Arizona Project.

California, on the other hand, claimed that existing mainstream projects exceed the safe annual yield of water in the Colorado River and there is no supply available for new projects in Arizona. California argued for an allocation to Arizona of approximately 3 million acre-feet of water from all sources in the Lower Basin, both mainstream and tributaries. Under California's method of system wide accounting, Arizona's share of the total Lower Basin apportionment would be in large part exhausted by her uses on the Gila River System, and California would be free to use most of the water available in the mainstream.

C.1.1 Application of Project Act

As summarized by the Master the most crucial issue is posed by this question: Is the application of the Project Act limited to the mainstream of the Colorado River or does it apply to the entire river system in the Lower Basin, that is to both mainstream and tributaries? Other important questions are at issue between

the two States, such as the interpretation, operative effect and validity of several sections of the Colorado River Compact, the Boulder Canyon Project Act and the water delivery contract between the United States and Arizona. At issue also is the effectiveness of Arizona's purported ratification of the Compact and the applicability of principles such as priority of appropriation and equitable apportionment.

Nevada took a third approach. She did not regard the Project Act or the water delivery contracts made by the Secretary of the Interior as controlling rights to water but viewed the litigation as a traditional suit for an equitable apportionment, in which she claimed the right to approximately 500,000 acre-feet of water based on needs projected to the year 2000.

C.1.2 Tributary Water

A second major controversy involved claims to tributary water by the States in which diversions from the tributaries occur. The important tributaries involved in this controversy were:

(1) The Gila River System, over which New Mexico and Arizona are in conflict;
(2) The Little Colorado River System, contested by the same two States; and
(3) The Virgin River System, the waters of which are claimed by Utah, Arizona, and Nevada.

C.1.3 Claims of United States

The United States asserted claims as against all of the States. The United States claimed power to regulate and control the use of Colorado River water pursuant to the Project Act and by reason of its ownership and control of Hoover Dam and the mainstream works below. The United States also claimed that it has reserved the use of water for the benefit of some 25 Indian Reservations and dozens of other Federal establishments located throughout the 132,000 square miles of the Lower Basin.

C.2 Prior Colorado River Litigation

The Special Master noted that the subject litigation is the fifth inter-State suit affecting the Colorado River, although it is the first in which evidence has been taken. The four prior suits were:

(1) On October 13, 1930, Arizona sued the Secretary of the Interior and six other Basin States to enjoin construction of Hoover Dam and the All-American Canal, to enjoin performance of contracts for delivery of stored water, and in addition, sought to have the Boulder Canyon Project Act and the Colorado River Compact declared unconstitutional. The Court, per Mr. Justice Brandeis, held *inter alia*, that the Compact and the Project Act were constitutional, that the River is a navigable stream, and that the Secretary of the Interior could construct Hoover Dam authorized by Section 1 of the Boulder Canyon Project Act. The Arizona bill was dismissed (*Arizona* v. *California*, 283 U.S. 423 (1931)).

(2) On February 14, 1934, Arizona moved for leave to file a bill to perpetuate the testimony of the negotiators of the Colorado River Compact. The parties named were the other six States of the Colorado River Basin, the California public agencies which are defendants in the present action, and the Secretary of the Interior. A unanimous Court, speaking through Mr. Justice Brandeis, denied the application (*Arizona* v. *California*, 292 U.S. 341 (1934)). An alternate ground for the decision was the incompetence of the evidence sought to be perpetuated.

(3) On January 14, 1935, the United States sued to enjoin Arizona's interference with construction of Parker Dam, which included Arizona's threat to use military force to prevent construction. The Court, per Mr. Justice Butler, dismissed the complaint on the grounds that there was no showing that the Secretary was authorized to construct the Dam (*United States* v. *Arizona*, 295 U.S. 174 (1935)). Subsequently, Congress, by Act of August 30, 1935, specifically authorized erection of Parker Dam for the purpose, *inter alia*, of improving navigation (49 Stat. 1039).

(4) In November 1935, Arizona filed a petition for leave to file a bill of complaint against California, Colorado, Nevada, New Mexico, Utah, and Wyoming praying for a judicial apportionment of the unappropriated water of the Colorado River. The Court, per Mr. Justice Stone, denied the petition on the ground that the United States was an indispensable party. Specifically left undecided was the question

whether an equitable division of the unappropriated water of the River could be decreed in a suit in which the United States was a party (*Arizona* v. *California*, 298 U.S. 558 (1936)).

C.2.1 Colorado River Basin Background

The Special Master's Report reviews the geography of the Colorado River Basin, the history of the Colorado River, pertinent legislation, the major works in the Lower Basin and their operation, the irrigation projects and districts, Indian Reservations and other water users in the Lower Basin, and discusses the mainstream water supply.

C.3 Mainstream Supply

The Special Master received evidence of estimates of future supply of mainstream water which will be available for consumptive use in the Lower Basin (Special Master's Report, page 99).

"Arizona and the United States take the position that it is neither necessary nor useful to attempt to predict the future Lower Basin supply in order to adjudicate this case. California, on the other hand, urges that supply should be estimated and this estimate used as the basis for decision. Nevada has also presented an estimate of future supply."

The Special Master concluded that a prediction of the future supply of Lower Basin mainstream water would be irrelevant to the legal issues involved in this case, and, moreover, would not be sufficiently accurate to shed light on any equitable considerations which might bear on the decision. Thus no attempt was made to predict future supply in this report.

The Special Master's reason as to the irrelevancy of future water supply estimates was that Congress and the Secretary of the Interior have established a formula for the apportionment of mainstream water among the three States of the Lower Basin with geographic access to the Colorado River: namely, Arizona, California, and Nevada. This formula allocates certain percentages of the available supply in any given year to each of the three States. Since the formula is not derived from supply and since it operates on whatever the supply happens to be in any given year, the Special Master concluded there is no need to predict future supply in order to determine how that supply is to be apportioned. In other words, the decree recommended by the Special Master states exactly how water is to be divided among the three States in the future, and provides for any supply situation which may develop. This it was held unnecessary to predict future supply conditions in order to adjudicate this case.

The Special Master concluded as follows:

"...This case involves a statutory, not an equitable, apportionment and that statutory apportionment applies irrespective of supply..."

(Special Master's Report, page 100).

California had contended that the future Lower Basin mainstream supply will not exceed 5,850,000 acre-feet per annum and that the proposed apportionment to California would result in severe curtailment of existing uses, including those of The Metropolitan Water District which serves Los Angeles and other cities on the southern California coastal plain. This contention, said the Special Master, resulted from California's deduction of evaporation and channel losses. The Special Master stated:

"...Even assuming that such a supply would result in this curtailment, a supply sufficient to satisfy 7,667,770 acre-feet per annum of consumptive uses in the Lower Basin would fulfill all of California's existing uses. (e.g., 4,483,825 maf/yr) ...This is so because consumptive use is defined as water diverted less return flow to the River which can be used by another project in the Lower Basin or in satisfaction of the Mexican Treaty...Since consumptive use is all water diverted less return flow, and return flow becomes available for consumption once it returns to the mainstream, supply and consumptive use will be approximately equal" (Special Master's Report, pages 103-104).

The Special Master noted:

"The supply of available water in the Colorado River has in the past been substantially larger than the demand for it; in short, every project received all the water it requested. In such circumstances it is not surprising that a great deal of water has been wasted, as is apparent, for example, from the very large unused runoff

each year into the Salton Sea. Undoubtedly when and if water becomes scarce in this area, its use will be regulated much more efficiently than at present. It appears that such practices as lining canals, reducing overordering of water, reusing runoff water, reducing evaporation, and improving channels can be instituted in the future and will effect a substantial reduction in the amount of water needed to satisfy existing California uses. It is impossible to determine exactly how much more efficiently water will be used if the present condition of abundance turns into one of shortage, but it is clear that savings will be such that California's existing uses could be satisfied by substantially less water than is presently diverted" (Footnote 25, page 103, Special Master's Report).

The Special Master noted the difficulty of an accurate determination of future supply in a stream system, particularly in the case of the Colorado River; that determination of future supply is at best a prediction—an estimate based on the past. He noted that the evidence presented shows the weakness of the science of hydrology in sustaining a prediction accurate enough to be helpful on the question, and that the difficulty of measuring streamflows, reservoir evaporation, channel losses, incomplete streamflow records, differences as to what past historical records to use, the use of reservoirs for flood control purposes, and the impact of Upper Basin uses on Lower Basin supply, create problems in estimating future supply.

California's contention that existing uses in that State will be curtailed under the apportionment proposed in the Special Master's Report is not justified, the Special Master stated, because existing California uses would not be curtailed until use increased in Arizona, Nevada, and the Upper Basin States. Moreover, it would be up to Congress to resolve the equities between California's existing uses and new uses in the Colorado River Basin since no new projects in either Basin which would affect Lower Basin mainstream supply can be constructed in the Colorado River Basin without Congressional action.

C.4 Jurisdiction and Justifiability

The Master noted that none of the parties in the litigation questioned the jurisdiction of the Supreme Court either over the parties or over the subject matter of the controversies which concern the mainstream of the Colorado River. Moreover, either explicitly or implicitly, all of the parties conceded that it was appropriate for the Supreme Court to exercise its jurisdiction and adjudicate these mainstream controversies at this time.

He also noted that there were compelling reasons to justify an adjudication of the various claims to Colorado River waters. A principal reason was that Arizona will not be able to develop the Central Arizona Project without an adjudication by the Supreme Court as to the rights of the several parties to the water in the mainstream and that, without the CAP or a similar project, Arizona will not be able to fully utilize the water which she claims has been set aside for her in the mainstream; that:

> "...unless this controversy among the three States and the United States is adjudicated, the full utilization of the Colorado River will be indefinitely delayed. Such a result would frustrate the purposes of Congress in authorizing the construction of Hoover Dam and would seriously hinder development of the entire area" (Special Master's Report, page 133).

The Special Master noted other reasons why the Supreme Court's jurisdiction should be exercised. These were the potential increase in irrigating lands in existing projects such as in Imperial Irrigation District, Coachella Valley County Water District, Palo Verde Irrigation District and increased diversions by The Metropolitan Water District, as well as the potential for developing increased uses of mainstream water in Arizona. Hence the need for adjudication of the Arizona claim so that both the California and Arizona agencies could plan future development.

The Special Master noted, however, that it would not be appropriate to adjudicate in this litigation controversies over the tributaries of the Colorado River in the Lower Basin, except those that concern the Gila River System (Footnote 1, Special Master's Report, page 129).

C.5 Inapplicability of Colorado River Compact

The Special Master noted that despite the Colorado River Compact's contribution of some light on the supply of mainstream water, insofar as it regulates the extent to which the river may be depleted by the Upper

Basin and hence affect the supply of water to the Lower Basin, it has no utility in the adjudication of this litigation, it offers no solution to this controversy among States with respect to their Lower Basin interests, and that it does not control the disposition of the case; and that the provisions of the Compact are addressed solely to the relations of Basin to Basin and not of State to State.

An interpretation of Articles III(a) and (b) of the Compact was provided by the Special Master. In addition to the view that "...Articles III(a) and (b) apportions the use of water between the two Basins and not among States." He stated that "...This apportionment is accomplished by establishing a ceiling on the quantity of water which may be appropriated in each Basin as against the other." In other words they are "...intended to prevent the application of the priority rule (prior appropriation) between the two Basins, a result accomplished by placing limits on the acquisition of appropriative or other water rights in each Basin..." Special Master's Report, pages 140 and 141).

The Special Master's analysis of the significance of the Compact provisions appears in pages 141 through 151 of his report and are included as Appendix 801.

C.6 Boulder Canyon Project Act Controls

One of the most significant conclusions of the Special Master was that:

"...the claims of Arizona, California, and Nevada to water from Lake Mead and from the mainstream of the Colorado River below Hoover Dam are governed by the Boulder Canyon Project Act, 45 Stat. 1057 (1929), the California Limitation Act of March 4, 1929, and the several water delivery contracts which the Secretary of the Interior has made pursuant to the authority vested in him by Section 5 of the Project Act. The Colorado River Compact, the doctrine of equitable apportionment, and the law of appropriation are all irrelevant to the allocation of such water among the three States" (Special Master's Report, page 138).

It was also the Special Master's opinion that:

"The Boulder Canyon Project Act is...the source of authority for the allocation and delivery of water to Arizona, California, and Nevada from Lake Mead and from the Colorado River below Lake Mead" (Special Master's Report, page 151).

The Master noted the provisions of Section 5 of the Boulder Canyon Project Act, which authorizes the Secretary of the Interior:

"...under such general regulations as he may prescribe to contract for the storage of water in said reservoir and for the delivery thereof at such points on the river...as may be agreed upon, for irrigation and domestic uses...."

To make its intention clear, Congress declared in Section 5 of the Project Act that:

"No person shall have or be entitled to have the use for any purpose of the water stored as aforesaid except by contract as herein stated" (Special Master's Report, page 151).

Also, the intention to exert authority over the allocation and distribution of water stored in Lake Mead can be derived from Section 8(b) which contemplates that the three Lower Basin States, or any two of them, might negotiate a compact for the equitable division of Colorado River water.

"These provisions, together with the general operational scheme established in the Project Act and the purposes of the Act explicated in the legislative history, make it clear that the Project Act was designed by Congress to establish the authority for an allocation of all of the available water in Lake Mead and in the mainstream of the Colorado River downstream from Lake Mead among Arizona, California, and Nevada, the only States having geographic access to this water. As to this water, principles such as equitable apportionment or priority of appropriation which might otherwise have controlled the inter-State division of the river in its natural flow condition were rendered inapplicable by the Project Act" (Special Master's Report, page 152).

The Special Master noted (Footnote 19, page 152, Special Master's Report) that since the Project Act does not affect rights to water flowing in the Colorado River upstream from Lake Mead, then principles are not abrogated by the Project Act to this reach of the river (see also Report, page 183).

The Special Master further noted that:

"The Act itself clearly reserves to the United States broad powers over the water impounded in Lake Mead and delegates this power to the Secretary of the Interior, as agent of the United States. He is

specifically authorized to impound the water of the Colorado River in Lake Mead and to exercise custody over the water so impounded through his control, management, and operation of the dam and reservoir. No user, whether it be a State or an individual, may receive the impounded water unless the Secretary, by contract, agrees to release it for delivery to that user. Nothing in the Act purports to require the Secretary to agree to deliver specific quantities of water to any particular State or user, except that Section 6 requires him to satisfy water rights perfected as of June 25, 1929...In short, no contract, no water, and the Secretary determines how much water he will contract to deliver to each State subject only to the limitations on his discretion expressed in the Project Act itself" (Special Master's Report, pages 152 and 153).

This conclusion, said the Special Master, that the Project Act provided the authority for the allocation of impounded water among the States, was supported by the legislative history of the Project Act.

As to the argument that the Project Act constitutes an unconstitutional assumption of power by the United States, the Special Master noted:

"Clearly the United States may construct a dam and impound the waters of the Colorado River, a navigable stream (citations)...Clearly, also, once the United States impounds the water and thereby obtains physical custody of it, the United States may control the allocation and use of unappropriated water so impounded. (citations)...Since Section 6 instructs the Secretary to satisfy property rights in mainstream water perfected as of June 25, 1929, the effective date of the Act, these rights are not in jeopardy. Rights that might be recognized as of that date under State law but that do not qualify as perfected rights under Section 6 do not receive this protection....Despite this fact, however, there is no need to pass on questions of ownership of water in navigable streams or of the validity against the United States of rights therein recognized by State law. There has been no showing that nonperfected rights recognized by State law as of June 25, 1929, if any, have not been satisfied since Hoover Dam was constructed. If it develops that such rights are not satisfied in the future, that will be time enough to determine whether they are of such character as require compensation for their taking" (Special Master's Report, pages 160 and 161).

The Special Master also rejected the argument that the Project Act constitutes an unconstitutional delegation of legislative power to the Secretary of the Interior because there are insufficient standards to govern his allocation of the water impounded in Lake Mead. He noted that the Act imposes substantial limitations on the Secretary's discretion; e.g., he may not contract with California for more than 4.4 maf out of 7.5 maf of consumptive use of mainstream water nor for more than one-half of surplus (Section 5(a)); he must satisfy present perfected rights (Section 6); contracts for water for irrigation and domestic uses must be for permanent service (Section 5); the Secretary, his permittees, licensees and contractees, "shall observe and be subject to and controlled by" the Colorado River Compact (Sections 8(a), 13(b), and 13(c)); the Secretary and those claiming under him are subject to any compact between Arizona, California and Nevada, or any two of them, approved by Congress (Section 8(b)). The Secretary is subject to the provisions of the Reclamation Law in the operation and management of the works authorized by the Project Act, except as otherwise provided therein (Section 14).

The Special Master noted that the Secretary has in fact exercised his discretion by making contracts which apportion the water available in Lake Mead substantially along the lines which Congress proposed in Section 4(a) of the Project Act as a fair and equitable division among Arizona, California and Nevada (Special Master's Report, pages 161 and 162).

C.7 Interpretation of "Waters Apportioned by Article III(a) of the Compact"

The Special Master concluded that Congress intended, in limiting California to 4.4 maf of "the waters apportioned to the Lower Basin States by paragraph (a) of Article III of the Colorado River Compact," simply to limit California's annual uses of water to 4.4 out of 7.5 maf.

The Special Master held that Section 4(a) of the Project Act and the California Limitation Act refer only to the water stored in Lake Mead and flowing in the mainstream below Hoover Dam, despite the fact that Article III(a) of the Compact deals with the Colorado River System, which is defined in Article II(a) as including the entire mainstream and tributaries.

The Special Master added that Congress intended Section 4(a) of the Project Act to apply only to the mainstream, where the works authorized by the Act were constructed. The United States cannot by its operation and control of Hoover Dam regulate the flow of water in the tributaries, nor can it deliver water on any of these streams.

This construction of Section 4(a) as applying only to the mainstream of the Colorado River required rejection of California's contention which would total all uses of system water in the Lower Basin (i.e., the mainstream plus tributaries) until the sum of 7.5 maf has been reached, after which she would assign all remaining uses to "excess or surplus water unapportioned by said compact." Since there are no tributaries to the Colorado River in California, California's position would exhaust the 7.5 maf apportionment with the help of tributary uses outside of California and would leave a large supply of mainstream water which California shares as "surplus." California would thus claim 4.4 maf plus 978,000 acre-feet of surplus, or her contract amounts of 5,362,000 maf/yr (Special Master's Report, pages 177 and 178).

C.8 California's Limitation Measured at Points of Diversion

The Special Master stated that Section 4(a) of the Project Act provides that the limitation (to 4.4 maf out of the first 7.5 maf) on California's use of water from the Colorado River is to be measured in terms not of water but of consumptive use of water, which is defined as diversions from the river less return flow thereto. Consumptive use is to be measured by diversions at each diversion point on the mainstream less returns to the mainstream measured or estimated by appropriate engineering methods, available for use in the United States or in satisfaction of the Mexican Treaty obligation. California is not charged for evaporation or channel losses which occur before the water is diverted. Losses which occur before diversion are a diminution of supply not a consumptive use (Special Master's Report, pages 185 through 194).

C.9 Interpretation of "Excess" or "Surplus" Waters

Although at one point the Special Master declined to define the term "surplus" as used in Article III(a) of the Compact (page 145) he concluded that the words "excess" or "surplus" waters must necessarily mean all consumptive use in the United States in any year from the mainstream in the Lower Basin in excess of 7.5 maf; i.e., once the 7.5 maf of consumptive use were allocated, the surplus accounting would commence and California would be eligible to receive 50 percent of all other allocations. This conclusion rejected Arizona's and Nevada's argument that Section 4(a) of the Project Act bars California from any share of what is described as Article III(b) water. The Special Master rejected the Compact definition of the phrase "excess or surplus waters unapportioned by said compact," as not applicable in the Project Act.

C.10 Beneficial Consumptive Use

The Special Master noted that "beneficial consumptive use" is not defined in the Compact but stated the term was intended to provide a standard for measuring the amount of water each Basin might appropriate and was intended to give each Basin credit for return flow. He stated that in the Compact, the terms means:

> "...consumptive use (as opposed to non-consumptive use, e.g., water power) measured by the formula of diversions less return flows, for a beneficial (that is, non-wasteful) purpose." (Special Master's Report, pages 147 and 148.)

C.11 Water Delivery Contracts Made by the Secretary of the Interior

The Special Master noted that the Secretary has contracted with the States of Arizona and Nevada and that he has also entered into contracts with California users which incorporate the provisions of the California "seven-party agreement" setting forth priorities among the California water users. All of these contracts (except one special use contract between the United States and the Arizona-Edison Company which the Special Master found invalid because it was for a fixed period of years and thus it was not for "permanent service" as

required by Section 5 of the Project Act) recite that deliveries under them are subject to the availability of water under the Colorado River Compact and the Boulder Canyon Project Act.

The Special Master stated that since Arizona, California, and Nevada have not entered into compacts for the allocation of mainstream water pursuant to Section 4(a) of the Project Act, the several water delivery contracts made by the Secretary govern this allocation. The Master found that these contracts were valid and binding both on the United States and the other contracting parties with the exception of a provision in the Arizona contract (Article 7(d)) that the United States obligation to deliver water is diminished by uses above Lake Mead and a provision in the Nevada contract (Article 5(a)) and the above noted special use contract with the Arizona-Edison Company.

The Special Master stated his view that State law governs intra-State rights and priorities to waters diverted from the Colorado River. The Special Master added that while a contract with the Secretary is necessary under Section 5 of the Project Act for a user to receive mainstream water, the user must also, under Section 18 of the Project Act, be under no disability to receive such water under the applicable State law (Special Master's Report pages 216 and 217). (But see Supreme Court Opinion, *Arizona* v. *California*, 373 U.S. 546, 586, where the Court rejected the Master's conclusion.)

Although the water delivery contracts were held to constitute an allocation of mainstream water, the Special Master noted that:

> "...the Secretary is not required to drain Lake Mead dry in fulfilling demands for delivery of water. In the exercise of a reasoned discretion he will decide how much water is to be released from the reservoir each year, and his decision may be based on any reasonable relevant factors. ...But once water is released for consumption in the United States, the delivery contracts oblige the Secretary to apportion certain quantities to each State." (Special Master's Report, pages 221 and 222.)

In other words, according to the Master:

> "The Secretary, in his discretion, decides how much water is to be released from mainstream reservoirs in any particular period. The amount available for consumption in the United States in any one year will be the amount so released less the amount necessary to satisfy higher priorities. The contracts do not limit the Secretary's discretion; they operate only upon mainstream water which is available for consumption in the United States. They require that this water be apportioned as follows: of the first 7.5 million acre-feet of consumptive use in 1 year, 4.4 for use in California, 2.8 in Arizona, and .3 in Nevada; of the remaining consumptive uses during that year, 50 percent for use in California and 50 percent in Arizona, subject to the possibility that Arizona's share may be reduced to 46 percent if the Secretary contracts to allocate 4 percent of surplus for use in Nevada." (Special Master's Report, pages 224 and 225.)

C.12 Allocation of Shortages

The Special Master concluded that the contractual allocation scheme which determined each State's apportionment of mainstream water, where there is sufficient mainstream water to satisfy 7.5 maf of consumptive use in the United States in 1 year as well as surplus in excess of 7.5 maf, also determined each State's apportionment in the event of insufficient mainstream water to supply 7.5 maf of consumptive use in 1 year. The allocation scheme also required each State to bear the burden of shortage ratably. Thus, in the event there is less than 7.5 maf of water available for consumptive use in the United States in any year each State is apportioned a pro rata share of the available water. (But see Supreme Court Opinion, *Arizona* v. *California*, 373 U.S. 546, 593, which rejected the pro rata apportionment and gave the Secretary the authority to apportion shortages.)

C.13 Deductions for Uses Above Lake Mead Invalid

The provisions of Article 7(d) of the Arizona contract and Article 5(a) of the Nevada contract reduce the Secretary's obligation to deliver water from Lake Mead for use in those States to the extent that the consumption of water in those States diminishes the flow of water in Lake Mead.

The Special Master found that these provisions are in violation of the Project Act and are unenforceable. The apportionment made by the water delivery contracts applies to water stored in Lake Mead and flowing in

the mainstream below Lake Mead. The Master rejected the argument advanced by the United States and California that diversions from the mainstream between Lake Mead and Lee Ferry are chargeable under the apportionment. The provisions of these two Articles are contrary to the command of Section 5 that "contracts respecting water for irrigation and domestic uses shall be for permanent service..., they violate Section 18, which directs that State law shall govern intrastate water rights and priorities, and they result in an allocation of mainstream water totally out of harmony with the limitation on California contained in Section 4(a)." (See Special Master's Report, page 237.) (But see Supreme Court Opinion, *Arizona* v. *California*, 373 U.S. 546, 591, where the Court differed with the Master and held that the Secretary had the authority to charge Arizona and Nevada for diversions from the mainstream between Lee Ferry and Lake Mead.)

The Special Master noted that a contract for a stated term of years would not be for "permanent service" and that the requirement thereof seems to have been intended to instruct the Secretary to contract for water deliveries in such a way as to assure users, as far as is physically possible, of a stable supply of water (Special Master's Report, pages 238 and 239).

C.14 United States Uses Charges to States

The Special Master concluded:

"All consumption of mainstream water within a State is to be charged to that State, regardless of who the user may be. Thus, consumption of mainstream water on United States Indian Reservations, National Parks, Forests, Monuments, and Recreation Areas, lands under the control of the Bureau of Land Management, reclamation projects, wildlife refuges, and other United States projects within the Lower Basin, all of which will be treated subsequently, is chargeable to the State within which the use is made." (Special Master's Report, page 247.)

C.15 United States Claims to Mainstream Water

C.15.1 Indian Reservations - Winter's Rights

The Special Master accepted the claim of the United States that, in addition to control of the mainstream by reason of the Boulder Canyon Project Act and its ownership and management of the various dams and works which regulate mainstream water, it has reserved water for needs of the Indian Reservations located on the Colorado River within the Lower Basin, independently of the State law of appropriation, in quantities sufficient to irrigate all the irrigable acreage in each of the Reservations and to satisfy related uses. Arizona asserted that the quantity of water reserved for an Indian Reservation is the amount necessary to satisfy the requirements of Indians living on the Reservation at any particular time. California denied that the United States intended to reserve water for all irrigable lands on an Indian Reservation (Special Master's Report, page 255).

The Special Master agreed with Arizona that there is no need to adjudicate the rights or priorities of Indian Reservations diverting water from the Lower Basin tributaries, except for the Gila River. As to the mainstream Indian Reservations, the Special Master concluded that this disagreement presented a justifiable controversy which required adjudication in order that the Secretary know how much water he may release for consumption on each Indian Reservation.

The Special Master sustained the claim of the United States that it has the power to create a water right appurtenant to the lands of an Indian Reservation without complying with State law. He cited *Winters* v. *United States*, 207 U.S. 564 (1908) as authority for the proposition that when the United States creates an Indian Reservation it may reserve water for the future needs of that Reservation and that appropriative water rights of others established subsequent to the Reservation must give way when it becomes necessary for the Indian Reservation to utilize additional water for its expanding needs (Special Master's Report, page 258).

This power to reserve water may be found in a treaty as well as by statute or executive order and need not be done expressly but may be implied from the circumstances surrounding the creation of the Reservation. Furthermore, water so reserved was not limited to the needs of the population then resident upon the

land, nor to the acreage being irrigated when the Reservation was created, but that enough water was reserved to satisfy the future expanding agricultural and related water needs of each Indian Reservation (Special Master's Report, page 260).

The Special Master was more specific as to the question of the quantity of water so reserved. He rejected an open end decree (Special Master's Report, pages 263 and 264) and concluded that the United States effectuated the intention to provide for the future needs of the Indians by reserving sufficient water to irrigate all of the "practicably" irrigable lands in a Reservation and to supply related stock and domestic uses. The magnitude of the water rights created by the United States is measured by the amount of irrigable land set aside within a Reservation and not by the number of Indians inhabiting it.

The amount of water reserved for the five mainstream Reservations and the water rights created thereby, are measured by the water needed for agricultural, stock and related domestic purposes. The reservations of water were made for the purpose of enabling the Indians to develop a viable agricultural economy; other uses, such as those for industry, which might consume substantially more water than agricultural uses, were not contemplated at the time the Reservations were created. Indeed, the United States asked only for enough water to satisfy future agricultural and related uses. This does not necessarily mean, however, that water reserved for Indian Reservations may not be used for purposes other than agricultural and related uses (Special Master's Report, pages 254 through 266).

The Special Master noted further:

"The water rights established for the benefit of the five Indian Reservations and enforced in the recommended decree are similar in many respects to the ordinary water right recognized under the law of many western states. They are of fixed magnitude and priority and are appurtenant to defined lands. They may be utilized regardless of the character of the particular user. Thus Congress has provided for the leasing of certain Reservation lands to non-Indians, and these lessees may exercise the water rights appurtenant to the leased lands. *Skeem* v. *United States*, 273 Fed. 93, 96 (9th Cir. 1921). The measurement used in defining the magnitude of the water rights is the amount of water necessary for agricultural and related purposes because this was the initial purpose of the reservations, but the decree establishes a property right which the United States may utilize or dispose of for the benefit of the Indians as the relevant law may allow. See *United States* v. *Powers*, 305 U.S. 527 (1939)." (Special Master's Report, page 266.)

C.15.2 Findings of Fact and Conclusions of Law

The Special Master made findings of fact and conclusions of law for the five Indian Reservations along the Colorado River: Chemehuevi, Cocopah, Yuma, Colorado River, and Fort Mohave. These findings and conclusions were carried forward and are enumerated in the decree recommended by the Special Master and adopted with certain exceptions by the Supreme Court. These findings of fact established the date when each Reservation was established, the number of acres of irrigable land, and the maximum annual diversion requirement in numbers of acre-feet of water.

The Special Master resolved a dispute concerning the boundaries of the Colorado River Indian Reservation and made a similar determination with regard to a boundary dispute on the Fort Mohave Indian Reservation. His reason for so doing was that a determination of the amount of irrigable acreage within the Reservations and the consequent award of a quantity of water based on this determination required adjudication of the boundaries. (But see Supreme Court Opinion which disagreed with the Special Master as to the need to determine these boundaries.)

C.15.3 National Forests, Recreation Areas, Parks, Memorials, Monuments and Lands Administered by the Bureau of Land Management

The Special Master found it necessary to treat only the Lake Mead National Recreation Area as the single recreational area which at that time diverted less than 300 acre-feet of water from the Colorado River, and concluded it was inappropriate to predict which other national forests, parks, monuments, memorials or lands administered by the Bureau of Land Management might attempt to utilize water from the mainstream in the future. He concluded that the United States had the power to reserve water in the

Colorado River for uses in the Lake Mead National Recreation Area for the same reason it could reserve such water for Indian Reservations and that the reservation of water was for "reasonable future requirements" without setting maximum limits thereon (Special Master's Report, pages 293 and 294).

C.15.4 Mexican Water Treaty

The Special Master stated that pursuant to the Treaty of February 2, 1944, between the United States and Mexico, the United States is obligated to deliver 1.5 maf of mainstream water to Mexico and this has priority over other water rights in the Basin. If, in fulfilling this treaty obligation, the United States divests water rights, compensation may be due. In this connection, however, Article III(c) of the Compact, which deals with a prospective water treaty with Mexico and provides how water to satisfy it is to be provided, may be significant.

C.15.5 Protection of Wildlife

The Special Master concluded that the United States intended to reserve water from the mainstream for the reasonable future needs of the Havasu Lake National Wildlife Refuge and the Imperial National Wildlife Refuge in diversions of no more than 41,839 acre-feet per annum and the consumptive use of no more than 37,339 acre-feet per annum for the Havasu Refuge, and for the diversion of no more than 28,000 acre-feet per annum and the consumptive use of no more than 23,000 acre-feet per annum for the Imperial Refuge. He rejected claims for the Cibola Valley Waterfowl Management Area since lands have not yet been withdrawn for that purpose. The Special Master noted that consumptive uses of mainstream water by the United States on Federal establishments are chargeable to the State within which the use occurs. As a corollary he concluded that the United States uses in each State are limited by the apportionment to the State in which the uses occur. The United States projects must be fitted into a schedule of priorities along with other uses within a State, all utilizing the State's mainstream apportionment beginning with the senior priority. The reason therefor is that the Project Act apportions water to each State for the total uses within said State and that no separate provision was made for the uses of the United States (Special Master's Report, pages 300 and 301).

C.15.6 Boulder City, Nevada

The Special Master upheld the claim of the United States to the right to deliver water from Lake Mead to Boulder City for "domestic, industrial and municipal" purposes pursuant to the Boulder City Act of September 2, 1958, 72 Stat. 1726; and that these deliveries are limited under that statute by the total amount of water available to Nevada under the Secretary's contractual apportionment. Boulder City's priorities are to be determined in the same manner as those of all other Nevada users under Nevada law, and its rights are subordinate to senior priorities under Nevada law. (Special Master's Report, pages 303 and 304; but see Supreme Court Opinion in *Arizona* v. *California*, 373 U.S. 546, 589, footnote 94, where the Court stated that "...contrary to the Master's conclusion, Boulder City's priorities are not to be determined by Nevada law.")

C.16 Mainstream Allocation

The Special Master summarized the apportionment which controls the consumption of water for use in the three Lower Basin States under the decree recommended in the report (Special Master's Report, pages 305 and 306):

"The Secretary of the Interior determines the total amount of water to be released from Lake Mead and from the several reservoirs on the mainstream of the Colorado River below Hoover Dam for consumptive use in Arizona, California, and Nevada. That determination is solely within the Secretary's reasoned discretion and presumably is based on the amount of water in Lake Mead and the reservoirs below, the amount necessary to satisfy the United States Treaty obligations to Mexico, necessities of 'river regulation,

improvement of navigation, and flood control,' predictions as to future supply, and other relevant conditions in the River Basin. The only specific limitation on his discretion is that he must follow the priorities set forth in Section 6 of the Project Act. The supply of water available for consumptive use in the three States, then, is neither more nor less than the quantity of water that the Secretary annually releases for this purpose.

"Of the mainstream water released for consumptive use in the United States the first 7,500,000 acre-feet of annual consumptive use is apportioned as follows: 2,800,000 acre-feet for use in Arizona; 4,400,000 acre-feet in California; and 300,000 acre-feet in Nevada.

"If sufficient mainstream water is released in 1 year to satisfy more than 7,500,000 acre-feet of consumptive use in the three States, such additional consumptive use is surplus and is apportioned as follows: 50 percent to California and 50 percent to Arizona, unless and until the Secretary makes a contract with Nevada for 4 percent of surplus, in which event, Nevada shall be apportioned 4 percent of surplus and to Arizona 46 percent of surplus.

"In the event that insufficient water is released from the mainstream reservoirs to satisfy 7,500,000 acre-feet of consumptive use in the United States in 1 year, the supply must be prorated among the three mainstream States. Each State's allocation is that proportion of the consumptive uses which can be satisfied by the available water which its apportionment of the first 7,500,000 acre-feet of mainstream consumption bears to the aggregate apportionment to all three States...(The Supreme Court disagreed with this method of apportioning shortages and authorized the Secretary to apportion shortages, *Arizona* v. *California*, 373 U.S. 546, 593).

"The Secretary of the Interior is required to make deliveries of water in accordance with the apportionments outlined above; the one exception to this requirement is prescribed by Section 6 of the Project Act, which directs that the dam and reservoir be operated in 'satisfaction of present perfected rights in pursuance of Article VIII of said Colorado River compact....' "

The Master noted, however, that California's consumptive use may not exceed 4.4 maf, whatever her "present perfected rights" might have been in 1929.

C.17 Present Perfected Rights

The Master had heretofore construed "present perfected rights" to mean rights perfected as of June 25, 1929, the effective date of the Project Act, and noted that neither the Compact nor the Project Act defines "perfected rights." He stated:

"It seems clear, however, that the term was not used in either of these enactments to refer to notices of appropriation which had not yet become the foundation of a going economy—mere paper filings on the River. The use of the term 'perfected rights' rather than the more familiar 'appropriative rights' suggests that Congress intended to limit the protection of Section 6 to rights of a more substantial character than paper filings sometimes recognized as an appropriative right under State law. Congress was concerned that those who were actually using water from the Colorado River and who relied on such water for their existing needs should not be deprived of it because of the proposed dam. But Congress was aware that many paper appropriations had been filed and claims of various sorts made to Colorado River water which, whatever their legal status under State law, were worthless as a practical matter unless and until the dam was built. Congress was not concerned to protect such claims. Projects and water uses developed by virtue of the construction of the dam did not need to be protected against its consequences. Of course, a water right is not a 'present perfected right' within the meaning of Section 6 unless it is recognized under the applicable State law, for if it cannot be vindicated under State law there would be no reason to protect it in the Project Act." (Special Master's Report, pages 307 and 308.)

The Special Master concluded:

"Hence I conclude that a water right is a 'present perfected right' and is within the protection of Section 6 only if it was, as of the effective date of the Project Act (June 25, 1929), acquired in compliance with the formalities of State law and only to the extent that it represented, at that time, an actual diversion and beneficial use of a specific quantity of water applied to a defined area of land or to a particular domestic or industrial use." (Special Master's Report, page 308.)

The Special Master rejected the suggestion by Imperial Irrigation District that State law would treat as "perfected" the right to take water in an amount measured by the capacity of existing works, even though said amount of water had never yet been actually diverted and applied to beneficial use.

He reiterated that:

"...the United States has the power to reserve water for the reasonable future needs of Federal establishments and that certain statutes, executive orders and other orders of withdrawal were intended to exercise this power. The water rights created by such a Federal reservation do not depend upon State law or upon the actual diversion and beneficial use of a specific quantity of water. On the contrary, they are superior to subsequent appropriations under State law, although the subsequent appropriator may be first to divert and use the water." (Special Master's Report, page 309).

He further stated that a reservation of water by the United States before June 25, 1929, is accorded the protection given by Section 6 of the Project Act to "present perfected rights" even though, as of that date, the rights were not acquired under State law and all of the water reserved had not been put to beneficial use. In that respect they differ radically from appropriative rights under State law which require the actual diversion and beneficial use of water. Thus, he concluded that water rights reserved before June 25, 1929, for Federal establishments are "perfected rights" within the meaning of Section 6.

The Special Master stated that in the unlikely event that water is so short that a State's apportionment is insufficient to satisfy present perfected rights therein, the Secretary must deliver water to satisfy such rights from each of the other State's apportionment in the proportion that each of the other State's apportionment of the first 7.5 maf of mainstream consumption bears to the aggregate apportionment to the two States.

C.18 Requirement for a Contract

"The water apportioned to each State is delivered to users within the State according to the provisions of the several delivery contracts. No user may consume mainstream water unless there is a contract with the Secretary providing for the delivery of such water. (In footnote 3a, page 312, the Master stated that contracts are not required for Indian Reservations and similar Federal establishments since the Secretary need not contract with himself.) Under the Project Act, State law governs rights and priorities among users within a single State, except for Federal establishments for which water has been reserved independent of State law. As to such establishments, the priorities recommended herein control." (Special Master's Report, page 312.)

C.19 Measurement of Consumptive Use

The Special Master noted:

"Consumptive use is measured at the several points of diversion in each State by a determination of the amount of water diverted from the mainstream less return flow thereto available for consumptive use in the United States or in satisfaction of the Mexican Treaty obligation. The Secretary must keep an account of diversions for each State. He must compute, as accurately as possible, the amount of usable return flow from water diverted and credit this amount to each State. Reservoir evaporation, channel and other losses sustained prior to the diversion of water from the mainstream are not chargeable to the States but are to be treated as diminution of supply. Only after water is diverted from the mainstream are losses on it chargeable to a State as consumption." (Special Master's Report, page 313.)

The Special Master stated:

"...until a State is prepared to apply to beneficial use all of its apportioned water, it has no cause for complaint if the water within its allocation is consumed elsewhere. Thus if, in any 1 year, water apportioned for consumptive use in a State will not be consumed in that State, whether for the reason that there are no delivery contracts outstanding for the full amount of the State's apportionment, or that users cannot apply all of such water to beneficial uses, or for any other reason, nothing herein shall be construed as prohibiting the Secretary of the Interior from releasing such apportioned but unused water during such year for consumptive use in the other States. No rights to the recurrent use of such water shall accrue by reason of the use thereof." (Special Master's Report, page 314.)

C.20 Rejection of Permanent Commission

California and Nevada have suggested that it would be useful for the Court to provide for a permanent commission or commissioner to administer the decree. The Special Master did not regard this as necessary. In view of the control of the mainstream vested in the Secretary of the Interior, he will in effect administer the decree.

C.21 Claims to Waters in Tributaries

The Special Master divided the controversies arising over tributary water into two general categories. The first category is the controversy between mainstream States and tributary States regarding rights in tributary supply. California expressed concern that increased use on the tributaries will decrease mainstream supply and proposed to treat present tributary inflow as part of the dependable supply in the mainstream. Arizona declared that adjudication of rights in tributary water would be premature and unwarranted. Nevada did not ask that increased uses on the tributaries be enjoined and sought a decree in favor of tributary users as against mainstream interests.

It was the conclusion of the Special Master that the principles of equitable apportionment controlled rights of mainstream States in water of the tributaries of the Colorado River in the Lower Basin. He concluded that the Compact did not displace those principles since it does not govern the relations, *inter sese*, of the States having Lower Basin interests nor did the Project Act and the California Limitation Act render the principles of equitable apportionment inapplicable. The tributaries which empty into the Colorado River in the Lower Basin, other than the Gila River, make a substantial contribution to the mainstream supply. However, the Special Master concluded there is no need to make an apportionment of tributary waters between mainstream and tributary States since mainstream users are presently enjoying the use of tributary flow and there is no indication that such enjoyment is in immediate danger of being interfered with. Hence, mainstream rights to tributary inflow ought not now be adjudicated and a more equitable apportionment might later be achieved when all practical aspects of the decreee are ascertained.

The second category are the controversies over tributary water in the tributary States, *inter sese*. These concern four tributary systems which flow into the Colorado River in the Lower Basin; i.e., the Little Colorado River System, the Virgin River System, Johnson and Kanab Creeks, and the Gila River System.

Nevada, New Mexico, and Utah sought to confirm present uses and to reserve water for future requirements on the inter-State tributaries of the Colorado River flowing within their borders. Arizona did not seek similar adjudication other than in the Gila River System. The United States claimed rights to the use of water from these tributaries for Indian Reservations and other Federal establishments. Since there was no evidence that a substantial conflict existed over the present use of tributary waters, except for the Gila River, and since there is presently unused tributary water regularly flowing into the mainstream from all of the tributaries except the Gila River, the Special Master concluded that the rights of tributary users, *inter sese*, to make increased use of tributary water in the future ought not to be adjudicated.

Similarly the Special Master felt it premature to determine the extent of United States rights in the tributaries. Since the tributaries are not subject to the legal and physical control of the Secretary there was no need to determine priorities in order that the Secretary of the Interior may know how to discharge his duties.

C.22 Gila River System

C.22.1 New Mexico's Claims

New Mexico sought an apportionment of the quantity of Gila River System waters in that State to satisfy its present and future requirements. These claims were resisted by both Arizona and the United States. Since the Gila River System is overappropriated and the available supply is not sufficient to satisfy the needs of existing projects, the Special Master concluded it was appropriate to adjudicate the controversy among New Mexico, Arizona and the United States over the right to water in the Gila System.

The Special Master concluded that a reduction of present New Mexico uses was not warranted despite the fact that many of them are junior in time to downstream Arizona users. The priorities adjudicated in the Gila decree, *United States* v. *Gila Valley Irrigation District* (Globe Equity No. 59), were confirmed but the interpretation of that decree was left to the United States District Court for the District of Arizona, particularly with regard to the use of underground water in addition to surface diversions. As to the 380.81 acres of land within the Virden Valley in New Mexico, not specified in the Gila decree, the compromise between Arizona and New Mexico permitted continued irrigation with water from underground water sources of the Gila River despite the United States objections that this use may reduce the surface supply in the Gila River and thus the quantity of water available for the Gila River Indian Reservation. Nevertheless, unless a change of condition required modification of the proposed decree, the Special Master felt it would be unreasonable to reserve water for future uses in New Mexico while senior downstream appropriators in Arizona remain unsatisfied.

C.22.2 United States Claims

As to the United States claims to reserved water for Federal establishments on tributaries of the Gila River, the conclusion was that it would be inexpedient to adjudicate this type of purely local claim. However, different considerations governed the claims of the United States to water from the Gila River and its inter-State tributaries, since these streams are overappropriated and the controversy is real and immediate.

The United States claimed Gila River water for three Indian Reservations; i.e., Gila River, San Carlos, and the Gila Bend Indian Reservations. The rights of the first two Reservations to divert waters from the mainstream of the Gila River are governed by the Gila decree. In addition, the Special Master felt no reasonable purpose would be served by allocating water to the Gila Bend Indian Reservation at the expense of reducing present New Mexico users, particularly since most of it would be lost in transit.

The Special Master felt it unnecessary to pass on the claims of the United States for any of the nine Federal establishments claiming water of the Gila River and its inter-State tributaries, except as to the Gila National Forest. The reason therefor was that the United States had not demonstrated that it presently utilizes or requires water to carry out the purposes of these establishments. Nevertheless, since the Gila National Forest presently diverted water from the Gila and San Francisco Rivers, a finding was warranted that the United States intended to reserve water necessary to fulfill the purpose for which the forest was created.

The Special Master made findings of fact and conclusions of law to augment the foregoing rights.

D. Special Master's Decree Recommended to Supreme Court

This contained the recommended decree of December 5, 1960, of the Special Master. The text of the Decree appears in the Appendix as 802.

CHAPTER IX

SUPREME COURT OPINION - ARIZONA v. CALIFORNIA OF JUNE 3, 1963, 373 U.S. 546; AND DECREE OF MARCH 9, 1964, 376 U.S. 340

A. Issues

Mr. Justice Black delivered the Opinion of the Court. He stated that:

"The basic controversy in the case is over how much water each State has a legal right to use out of the waters of the Colorado River and its tributaries." (Opinion, page 551.)

According to the Court this question turned on the meaning and the scope of the Boulder Canyon Project Act passed by Congress in 1928, 45 Stat. 1057 (1928) which controlled the solution of the issue. The Court concluded that Congress, acting under the powers granted by the Commerce Clause and the Property Clause of the Constitution, in enacting the Boulder Canyon Project Act, provided a method of apportionment of waters among the States of the Lower Basin; that the method chosen in the Act "was a complete statutory apportionment intended to put an end to the long standing dispute over Colorado River waters." (Opinion page 560.)

The Court observed that Section 4(a) of the Act was designed to protect the Upper Basin against California should Arizona refuse to ratify the Compact. It provided that, if fewer than seven States ratified within 6 months, the Act should not take effect unless six States including California ratified and unless California, by its legislature, agreed "irrevocably and unconditionally...as an express covenant" to a limit on its annual consumption of Colorado River water of 4.4 maf of the waters apportioned to the Lower Basin States by Article III(a) of the Colorado River Compact, plus not more than one-half of any excess or surplus waters unapportioned by said Compact. Section 4(a) of the Act, said the Court, also showed the continuing desire of Congress to have California, Arizona, and Nevada settle their own differences by authorizing them to make an agreement apportioning to Nevada 300,000 acre-feet, and to Arizona 2.8 maf plus one-half of any surplus waters unapportioned by the Compact. The permitted agreement also would allow Arizona exclusive use of the Gila River wholly free from any Mexican obligation, a position Arizona had taken from the beginning. Sections 5 and 8(b) of the Project Act made provisions for the sale of the stored water.

The Court noted that the Project Act became effective on June 25, 1929, by Presidential proclamation after six States, including California, had ratified the Colorado River Compact and the California legislature accepted the limitation of 4.4 maf as required by the Act. Neither the three States nor any two of them ever entered into any apportionment compact as authorized by Sections 4(a) and 8(b). After the construction of Hoover Dam the Secretary had made contracts with various users in California for 5,362,000 acre-feet, with Nevada for 300,000 acre-feet, and with Arizona for 2,800,000 acre-feet of water from that stored at Lake Mead.

The Court observed that the Special Master found that the Colorado River Compact, the law of prior appropriation, and the doctrine of equitable apportionment do not control the issues in this case. The Court noted that the Master concluded that, since the Lower Basin States had failed to make a compact to allocate the waters among themselves as authorized by Sections 4(a) and 8(b) of the Boulder Canyon Project Act, the Secretary's contracts with the States had, within the statutory scheme of Sections 4(a), 5 and 8(b), effected an apportionment of the waters of the mainstream which, according to the Master, were the only waters to be apportioned under the Act.

The Court further noted that the Master had held that, in the event of a shortage of water which made impossible the supply of water due the three States under their contracts, the burden of the shortage must be borne by each State in proportion to their share of the first 7.5 maf allocated to the Lower Basin (the Court differed with this).

Arizona, Nevada, and the United States supported with few exceptions the Special Master's Report, but California was in basic disagreement with almost all of the Master's Report.

B. Boulder Canyon Project Act Controlled Apportionment

The Supreme Court concluded that:

"...Congress in passing the Project Act intended to and did create its own comprehensive scheme for the apportionment among California, Arizona, and Nevada of the mainstream waters of the Colorado River, leaving each State its tributaries. Congress decided that a fair division of the first 7,500,000 acre-feet of mainstream water would give 4,400,000 acre-feet to California, 2,800,000 to Arizona, and 300,000 to Nevada; Arizona and California would each get one-half of any surplus...Division of the water did not, however, depend on the States agreeing to a compact, for Congress gave the Secretary of the Interior adequate authority to accomplish the division. Congress did this by giving the Secretary power to make contracts for the delivery of water and by providing that no person could have water without a contract." (Opinion page 565.)

C. Compact, Prior Appropriation and Equitable Apportionment Inapplicable

The Court rejected California's argument that the doctrine of equitable apportionment was applicable and agreed with the Master that apportionment of the Lower Basin waters of the Colorado River was not controlled by that doctrine or by the Colorado River Compact; that while the doctrine of equitable apportionment was used to decide river controversies between States; e.g., *Wyoming* v. *Colorado*, 259 U.S. 419 (1922); *Nebraska* v. *Wyoming*, 325 U.S. 589 (1945), in those cases Congress had not made any statutory apportionment. Thus, where Congress provided its own method for allocating among the Lower Basin States the mainstream water to which they are entitled under the Compact the courts have no power to substitute their own notions of an equitable apportionment for an apportionment chosen by Congress.

The Court further agreed with the Special Master that the Colorado River Compact does not control this case. It stated that:

"In this case, we have decided that Congress has provided its own method for allocating among the Lower Basin States the mainstream water to which they are entitled under the Compact...Nothing in that Compact purports to divide water among the Lower Basin States nor in any way to affect or control any future apportionment among those States or any distribution of water within a State." (Opinion page 565.)

The Court noted that the Compact is relevant for some purposes. It provided an inter-Basin division; some of its terms are incorporated in the Project Act and are applicable to the Lower Basin, and were placed in the Act to insure that it would not "upset, alter or affect the Compact's Congressionally approved division of water between the Basins." (Opinion page 567.)

D. States Control Use of Tributaries

The Court rejected California's claim that the Project Act, like the Colorado River Compact; i.e., Section 4(a) of the Project Act and Article III(a) of the Compact, dealt with the main river and all of its tributaries. Another California view rejected by the Court was that the first 7.5 maf of Lower Basin water, of which California has agreed to use only 4.4 maf, is made up of both mainstream and tributary water, not just mainstream water. The Court concluded:

"Under the view of Arizona, Nevada, and the United States, with which we agree, the tributaries are not included in the waters to be divided but remain for the exclusive use of each State." (Opinion page 567.)

The court noted that assuming 7.5 maf or more in the mainstream and 2 maf in the tributaries, California would get 1.0 maf more if the tributaries are included and Arizona would get 1.0 maf less. Under the California view, diversions in Nevada and Arizona of tributary waters flowing in those States would be charged against their apportionments and that, because tributary water would be added to the mainstream water in computing the first 7.5 maf available to the States, there would be a greater likelihood of a surplus, of which California would get one-half; i.e., "much more water for California and much less for Arizona."

The Court stated that the Project Act itself dealt only with waters of the mainstream and that the tributaries were reserved to each State's exclusive use. The Court noted that in the negotiations among the States the Lower Basin allocations dealt with "mainstream water, or the water to be delivered by the Upper States at

Lee Ferry, that is to say, an annual average of 7,500,000 acre-feet of mainstream water." (Opinion page 570.)

And finally, in considering California's claim to share in the tributaries of other States, it was important that from the beginning of the discussions and negotiations which led to the Project Act, Arizona had consistently claimed sole use of the Gila River, upon which her existing economy depended.

E. Congress Provided for Apportionment of Water

Thus the Supreme Court concluded:

"The legislative history, the language of the Act, and the scheme established by the Act for the storage and delivery of water convince us also that Congress intended to provide its own method for a complete apportionment of the mainstream water among Arizona, California, and Nevada." (Opinion page 579.)

The Court further stated:

"Having undertaken this beneficial project, Congress, in several provisions of the Act, made it clear that no one should use mainstream waters save in strict compliance with the scheme set up by the Act. ...To emphasize that water could be obtained from the Secretary alone, Section 5 further declared, 'No person shall have or be entitled to have the use for any purpose of water stored as aforesaid except by contract made as herein stated.' " (Opinion, pages 579-580.)

"These several provisions, even without legislative history, are persuasive that Congress intended the Secretary of the Interior, through his Section 5 contracts, both to carry out the allocation of the water of the main Colorado River among the Lower Basin States and to decide which users within each State would get water. The general authority to make contracts normally includes the power to choose with whom and upon what terms the contracts will be made." (Opinion page 580).

"...the Secretary is bound to observe the Act's limitation of 4,400,000 acre-feet on California's consumptive uses out of the first 7,500,000 acre-feet or mainstream water. This necessarily leaves the remaining 3,100,000 acre-feet for the use of Arizona and Nevada. ...Nevada...took the position...that her conceivable needs would not exceed 300,000 acre-feet which...left 2,800,000 acre-feet for Arizona's use. Moreover, Congress indicated that it thought this a proper division of the waters when in the second paragraph of Section 4(a) it gave advance consent to a tri-State compact adopting such division. *While no such compact was ever entered into, the Secretary by his contracts has apportioned the water in the approved amounts and thereby followed the guidelines set down by Congress."* (underscoring added) (Opinion, pages 583-584.)

E.1 Prior Appropriation Inapplicable

The Court rejected California's contention that the traditional Western water law of prior appropriation should determine the rights of the parties to the water. It noted that in an earlier version of the Boulder Canyon Project Act the bill did limit the Secretary's contract power by making the contracts "subject to rights of prior appropriators" but that restriction did not survive and that "...had Congress intended so to fetter the Secretary's discretion, it would have done so in clear and unequivocal terms, as it did in recognizing 'present perfected rights' in Section 5." (Opinion, page 581.)

E.2 State Water Law Inapplicable

The Court rejected the arguments that Congress in Sections 14 and 18 of the Project Act took away practically all the Secretary's power by permitting the States to determine with whom and on what terms the Secretary would make water contracts. It was the Court's view that nothing in those provisions affected the Court's decision that it is the Act and the Secretary's contracts, not the laws of prior appropriation, that control the apportionment of water among the States. The Court held, contrary to the Master's conclusion, that "the Secretary in choosing between users within each State and in settling the terms of his contracts is not bound by these Sections to follow State law."

The Court stated that the arguments that Section 8 of the Reclamation Act requires the United States, in the delivery of water, to follow priorities laid down by State law had been disposed of by the Supreme Court's decision in *Ivanhoe Irr. Dist.* v. *McCracken*, 357 U.S. 275 (1958). Likewise, the Court concluded that Section 18 of the Project Act did not require the Secretary to contract according to State law; that Section 18 preserved such right as the States "now" have, that is, such rights as they had at the time the Act was passed; and that the general saving language of Section 18 cannot bind the Secretary by State law and thereby nullify the contract power expressly conferred upon the Secretary by Section 5.

Thus, "...where the Secretary's contracts...carry out a Congressional plan for the complete distribution of water to users, State law has no place." (Opinion, page 588.)

By footnote the Court stated that it follows from its conclusions as to the inapplicability of State law that, contrary to the Master's conclusion, the priorities accorded to the supply of water to Boulder City, Nevada, by the Act of September 2, 1958 72 Stat. 1726, were not to be determined by Nevada law. (Opinion, footnote 94 at page 588.)

F. Secretary Can Charge For Diversions Above Lake Mead

The Court discussed the provisions in the Secretary's contracts with Arizona and Nevada which provided that any waters diverted by those States out of the mainstream or the tributaries above Lake Mead must be charged to their respective Lower Basin apportionments. The Special Master had taken the position that the apportionment to the Lower Basin States was to be made out of the waters actually stored at Lake Mead or flowing in the mainstream below Lake Mead and had held that the Secretary was without power to charge Arizona and Nevada for diversions made by them from the 275 mile stretch of river between Lee Ferry and Lake Mead or from the tributaries above Lake Mead.

G. Secretarial Control of Mainstream Below Lee Ferry

The Court held that the Master was correct in deciding that the Secretary cannot reduce water deliveries to Arizona and Nevada by the amounts of their uses from tributaries above Lake Mead, since Congress in the Project Act intended to apportion only the mainstream, leaving to each State its own tributaries. The Court disagreed, however, with the Master's holding that the Secretary is powerless to charge States for diversions from the mainstream above Lake Mead. Its reason was that Congress provided in the Project Act for an apportionment among the Lower Basin States of the water allotted to that Basin by the Colorado River Compact; that the Lower Basin begins at Lee Ferry; and that it was all the water in the mainstream below Lee Ferry that Congress intended to divide among the States.

The Court stated:

"Were we to refuse the Secretary the power to charge States for diversions from the mainstream between Lee Ferry and the dam site, we would allow individual States, by making diversions that deplete the Lower Basin's allocation, to upset the whole plan of apportionment arrived at by Congress to settle the long standing dispute in the Lower Basin." (Opinion, page 591.)

H. Secretary's Sole Right To Contract For Water

Nevada excepted to her inclusion in Paragraph II(b)(7) of the Master's recommended decree, which provides that "mainstream water shall be delivered to users in Arizona, California and Nevada only if contracts have been made by the Secretary of the Interior, pursuant to Section 5 of the Boulder Canyon Project Act, for the delivery of such water." Nevada contended that its contract should be construed as a contract to deliver water to the State and should not require subcontracts by the Secretary directly with Nevada water users. The Court rejected this argument and stated:

"Acceptance of Nevada's contention here would not only undermine this plain Congressional requirement that water users have contracts with the Secretary but would likewise transfer from the Secretary to Nevada a large part, if not all, of the Secretary's power to determine with whom he will contract and on what terms. We have already held that the contractual power granted the Secretary cannot be diluted in this manner." (Opinion, page 592.)

I. Apportionment in Time of Shortage

The Master had concluded that the Project Act and the Secretary's contracts required the Secretary in case of shortage to divide the burden among the three States on a pro rata basis in accordance with the percentage allocated to each State out of the 7.5 maf apportioned to the Lower Basin. The Court concluded that while this seems equitable on its face, the Secretary should be free to choose among the recognized methods of apportionment or to devise reasonable methods of his own, and that requiring him to pro rate shortages would impair the power vested in him to make decisions which would affect not only irrigation uses but also flood control, improvement of navigation, regulation of flow, and generation and distribution of electric power. For those reasons the Court refused to accept California's contention that in the case of shortage each State's share of water should be determined by the judicial doctrine of equitable apportionment or by the law of prior appropriation.

J. Arizona-New Mexico Gila Controversy

Arizona and New Mexico had conflicting claims to water in the Gila River. Having determined that tributaries are not within the regulatory provisions of the Project Act, the Master held that this inter-State dispute should be decided under the principles of equitable apportionment.

The Court accepted the Master's recommendations that a compromise settlement of the claims of Arizona and New Mexico to water in the Gila River, agreed upon by these States, be included in his recommended decree.

K. Claims of the United States

The United States had asserted claims to waters in the main river and in some of the tributaries for use on Indian Reservations, National Forests, Recreational and Wildlife areas and other Government lands and works. The Court approved the Master's conclusions as to which claims required adjudication and in declining to reach other claims, particularly those relating to tributaries. The Court likewise approved the decree recommended by the Master for the Government's claims to waters of the mainstream and discussed the claims of the United States on behalf of the five Indian Reservations for which rights were asserted to mainstream water. "The aggregate quantity of water which the Master held was reserved for all the Reservations is about 1,000,000 acre-feet, to be used on about 135,000 irrigable acres of land."

K.1 Indian Reservations - Winters' Doctrine

The Court followed the doctrine enunciated in *Winters* v. *United States*, 207 U.S. 564 (1908) that the United States, when it created the Indian Reservations, intended to reserve for them the waters without which their lands would have been useless, and that the water rights were reserved as of the time the Indian Reservations were created. The Court concurred with the Master that these water rights, having vested before the Boulder Canyon Project Act was passed in 1929, are "present perfected rights" and as such are entitled to priority under the Act.

The Court also agreed with the Master as to the quantity of water intended to be reserved in his ruling that enough water was reserved to irrigate all of the practicably irrigable acreage on the Reservations.

K.2 Inappropriate to Determine Boundary Disputes

The Court disagreed with the Master's decision to determine the disputed boundaries of the Colorado River Indian Reservation and the Fort Mohave Indian Reservation and held it unnecessary to resolve those disputes at this time. The Court stated:

> "Should a dispute over title arise because of some future refusal by the Secretary to deliver water to either area, the dispute can be settled at that time." (Opinion, page 601.)

K.3 Other Federal Establishments

The Court also agreed with the Master that the principle underlying the reservation of water rights for Indian Reservations was equally applicable to the reservation of water for other Federal establishments such as the Lake Mead Recreational Area, Havasu and Imperial Wildlife Refuges, and the Gila National Forest.

The Court rejected Arizona's contention that the judicial doctrine of equitable apportionment should be used to divide water between the Indians and the non-Indians in Arizona. Its reason was that the doctrine is applicable to disputes between States and that an Indian Reservation is not a State. Arizona's contention that the Federal Government had no power, after Arizona became a State, to reserve waters for Federally reserved lands was also rejected as was Arizona's arguments that water rights cannot be reserved by Executive Order. The Court's adherence to the *Winters Doctrine* was also a rejection of Arizona's claims that there was no evidence that the United States, in establishing the Reservations, intended to reserve water for them and even if it was intended to be reserved the Master had awarded too much water to them.

K.4 Uses by United States

The Court also rejected the claim of the United States that it is entitled to the use, without charge against its consumption, of any waters that would have been wasted but for salvage by the Government on its wildlife preserves. The Court stated that whatever its intrinsic merits, such a claim is inconsistent with the Boulder Canyon Project Act's command that consumptive use shall be measured by diversions less returns to the river.

Finally, the Court noted its agreement with the Master that all uses of mainstream water within a State are to be charged against that State's apportionment, which of course included uses by the United States.

L. Dissents to Opinion

The Court allowed the parties to submit the form of decree to carry this opinion into effect, failing which, the Court stated it would prepare and enter an appropriate decree.

There were two dissents to the majority opinion. One dissent was only a partial dissent. This was written by Mr. Justice Harlan with whom Mr. Justice Stewart was a party. Mr. Justice Douglas also joined in the dissent, insofar as it objected to the majority opinion. Generally speaking, the partial dissent agreed with the majority opinion, except that Mr. Justice Harlan did not believe that the Project Act granted to the Secretary the authority to make an apportionment of the mainstream in the Lower Basin to the States of Arizona, California, and Nevada, either in times of surplus or shortage. It was the position of the partial dissent that "equitable principles established by the Court in inter-State water right cases, as modified by the Colorado River Compact and the California Limitation" was intended by Congress to govern any Lower Basin apportionment. Also, this partial dissent believed that State water laws were intended to control the intra-State uses of Colorado River water.

Mr. Justice Douglas wrote a separate dissenting opinion in which he took issue with the whole of the majority opinion of the Court. Mr. Justice Douglas stated it was not a question of the power of Congress to act, but rather the question was how Congress had acted in its passage of the Boulder Canyon Project Act. He found from the study of the same legislative history and historical background relied upon by the majority that Congress did not intend to replace State water laws by a Federal allocation system under the absolute control of the Secretary of the Interior. The Project Act did not limit the quantity of water to which the California Limitation Act applied to only the main stream. For Mr. Justice Douglas the Colorado River system; i.e., Lower Basin mainstream and tributaries, was the area with which the Project Act dealt. In other words California was limited to 4,400,000 acre-feet of Colorado River system water, and the balance of Colorado River system water was to be divided between the other four Lower Basin States according to the principles of equitable apportionment as has been developed heretofore in other inter-State water suits. Mr. Justice Douglas found that the record before the Court did not allow for an equitable apportionment of the balance of the Colorado River system water among the three States; and, therefore, should be sent back for a complete record (page 33, Fifteenth Annual Report of the Upper Colorado River Commission, September 30, 1963).

M. Supreme Court Opinion of June 3, 1963, and Decree of March 9, 1964

The Supreme Court Opinion appears in Appendix 901. The Supreme Court Decree appears in Appendix 902.

CHAPTER X

PRESENT PERFECTED RIGHTS

A. Background

The term "present perfected rights" first appeared in the "Law of the River" (but was not then defined) in Article VIII of the Colorado River Compact executed November 24, 1922.

Article VIII of the Compact provides:

"Present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this compact. Whenever storage capacity of 5,000,000 acre-feet shall have been provided on the main Colorado River within or for the benefit of the Lower Basin, then claims of such rights, if any, by appropriators or users of water in the Lower Basin against appropriators or users of water in the Upper Basin shall attach to and be satisfied from water that may be stored not in conflict with Article III.

"All other rights to beneficial use of waters of the Colorado River system shall be satisfied solely from the water apportioned to that basin in which they are situate."

The term "present perfected rights" next appeared in Section 6 of the Boulder Canyon Project Act of December 21, 1928, 45 Stat. 1057, 1061. The first sentence states:

"That the dam and reservoir provided for by Section 1 hereof shall be used: First, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and satisfaction of present perfected rights in pursuance of Article VIII of said Colorado River Compact; and third, for power...."

Section 4(a) of that Act is also relevant in that California's limitation to 4.4 maf/yr includes "...all uses under contracts made under the provisions of this act and all water necessary for the supply of any rights which may now exist...."

The Report of the Special Master in *Arizona* v. *California*, 373 U.S. 546 (1963), dated December 5, 1960, discusses the term (see pages 152, 153, 161, 234, 235, and 305 through 310). The Special Master stated:

"Neither the Compact...nor the Project Act defines 'perfected rights'. It seems clear, however, that the term was not used in either of these enactments to refer to notices of appropriation which had not yet become the foundation of a going economy—mere paper filings on the river...."

B. Determination Required by Decree

Finally, the Special Master's recommended Decree and the Decree of the Supreme Court in *Arizona* v. *California*, dated March 9, 1964, 376 U.S. 340, provided these definitions in Article I(G) and (H). These provide:

"(G) 'Perfected right' means a water right acquired in accordance with State law, which right has been exercised by the actual diversion of a specific quantity of water that has been applied to a defined area of land or to definite municipal or industrial works, and in addition shall include water rights created by the reservation of mainstream water for the use of Federal establishments under Federal law whether or not the water has been applied to beneficial use;

"(H) 'Present perfected rights' means perfected rights as here defined, existing as of June 25, 1929, the effective date of the Boulder Canyon Project Act";

Article VI of the Decree triggered the determination of "present perfected rights." It provides:

"Within 2 years from the date of this Decree, the States of Arizona, California, and Nevada shall furnish to this Court and to the Secretary of the Interior a list of the present perfected rights, with their claimed priority dates, in waters of the mainstream within each State, respectively, in terms of consumptive use, except those relating to Federal establishments. Any named party to this proceeding may present its claim of present perfected rights or its opposition to the claims of others. The Secretary of the Interior shall supply similar information within a similar period of time, with respect to the claims of the United States to present perfected rights within each State. If the parties and the Secretary of the Interior are unable at that time to

agree on the present perfected rights to the use of mainstream water in each State, and their priority dates, any party may apply to the Court for the determination of such rights by the Court."

In an order dated February 28, 1966, 383 U.S. 268, Article VI was amended to allow 3 years from the date of the Decree, which was March 9, 1964, for the actions called for.

C. Importance of Present Perfected Rights

Present perfected rights are important because of the provisions of Article II(B)(3) of the Decree. It provides that in any year in which there is less than 7.5 maf of mainstream water available for release for consumptive use in Arizona, California, and Nevada, the Secretary of the Interior shall first provide for satisfaction of present perfected rights in the order of their priority dates without regard to State lines and, after consultation with major contractors and such representatives as the States may designate, may apportion the amount remaining available for consumptive use in a manner consistent with the Boulder Canyon Project Act as interpreted by the Supreme Court Opinion and with other applicable Federal statutes, except that California shall not be apportioned more than 4.4 maf including all present perfected rights.

D. Effect of Section 301(b) of Basin Project Act

The impact of Article II(B)(3) of the Decree was modified by Section 301(b) of the Colorado River Basin Project Act, Public Law 90-537, dated September 30, 1968, 82 Stat. 885. This provided that Article II(B)(3) shall be so administered as to give holders of present perfected rights, users served under existing contracts, and Federal reservations (primarily Indian Reservations) priority over the Central Arizona Project (CAP) diversions, with California's priority limited to 4.4 maf/yr. Section 301(b) states:

"(b) Article II(B)(3) of the Decree of the Supreme Court of the United States in Arizona against California (376 U.S. 340) shall be so administered that in any year in which, as determined by the Secretary, there is insufficient mainstream Colorado River water available for release to satisfy annual consumptive use of seven million five hundred thousand acre-feet in Arizona, California, and Nevada, diversions from the mainstream for the Central Arizona Project shall be so limited as to assure the availability of water in quantities sufficient to provide for the aggregate annual consumptive use by holders of present perfected rights, by other users in the State of California served under existing contracts with the United States by diversion works heretofore constructed, and by other existing Federal reservations in that State, of four million four hundred thousand acre-feet of mainstream water, and by users of the same character in Arizona and Nevada. Water users in the State of Nevada shall not be required to bear shortages in any proportion greater than would have been imposed in the absence of this subsection 301(b). This subsection shall not affect the relative priorities, among themselves, of water users in Arizona, Nevada, and California which are senior to diversions for the Central Arizona Project, or amend any provisions of said Decree."

Despite these priorities over CAP, present perfected rights affect water shortage allocations if mainstream supply falls below the protection levels provided in Public Law 90-537.

E. Present Perfected Rights Include Federal Establishments

Present perfected rights (PPRs) are defined in Articles I(G) and (H) of the Decree as including water rights created by the reservation of mainstream water for the use of Federal establishments under Federal law whether or not water has been applied to beneficial use as of June 25, 1929, and are deemed applicable to the five Indian Reservations and the Lake Mead National Recreation Area designated in Article II(D) of the Decree.

F. Events Leading to Draft Stipulation of Present Perfected Rights

Following the issuance of the Decree in *Arizona* v. *California* on March 9, 1964, 376 U.S. 340, the Department of the Interior (Interior) authorized the Bureau of Reclamation (Reclamation) to be the lead agency in carrying out the provisions of Article VI of the Decree. On February 2, 1965, the Solicitor of the

Department of the Interior, in recognition of the fact that the Decree requires the Secretary to prepare a list of the Federal PPR claims in each State and clearly implies that each party has the duty of appraising and making a judgment as to the PPRs and the priority dates claimed by the other parties, asked the Regional Solicitor's office at Los Angeles, California, to produce a program for getting the information required by the Decree. A tentative program was agreed to in February 1965 by representatives of the Solicitor's office, Reclamation, and the Department of Justice. This included the preparation of a listing of PPR claims in each State for Federal establishments such as the Indian Reservations, and those of Federal irrigation projects to assure that their rights would not be adversely affected by State actions, as well as the development of adequate information to enable the United States to comment on PPR claims advanced by the States.

F.1 Meetings with States

On June 21, 1964, Reclamation's Regional Director, Boulder City, Nevada, asked the Lower Basin States as to the status of present perfected right claims within each State and proposed that each State appoint a representative for the purpose of discussing the matter with the United States.

In July 1964, the Arizona Interstate Stream Commission, which assumed the lead role for determining Arizona's PPRs, sent a "notice to all persons claiming present perfected rights..." to present detailed information substantiating their claims to the Commission. Copies of the replies thereto were transmitted to Reclamation; e.g., see Commissioner's letter of November 13, 1965.

Similarly, on December 8, 1964, California, represented by the California Attorney General's Office, sent letters to those California miscellaneous users of Colorado River water which it was able to identify, and requested answers to detailed questions in an effort to identify PPR claimants. California's first submittal of these claims was its letter to Reclamation of February 3, 1967.

The aforementioned program initiated by Interior and Justice in February 1965 was aimed at ascertaining, if possible, the precise acres irrigated prior to June 25, 1929, and the number of acre-feet of water used on those acres, not only for the Federal reclamation projects administered by Reclamation but also for projects such as Imperial Irrigation District and Palo Verde Irrigation District in California and the North Gila Valley of the Yuma-Mesa Division of the Gila Project in Arizona (see memorandum of March 9, 1965, from Associate Solicitor, Water and Power, to the Solicitor).

The above effort was prompted by that portion of Article I(G) of the Decree which refers to a water right which "...has been exercised by the actual diversion of a *specific quantity of water* that has been applied to a *defined area of land*..." (underscoring added). The problem was whether that right related to a precise single landholding or to an entire district. Likewise, whether the "...specific quantity of water that had been applied..." could be an unspecified quantity reasonably necessary to irrigate the specific land or a fixed quantity for an entire district.

F.2 United States Preparation of Data

In a document dated July 1, 1965, and entitled "Data and Tentative Conclusions Concerning Present Perfected Rights of Federal Reclamation Projects in Arizona and California" (1965 Data), the first analysis was made by Reclamation and the Regional Solicitor's Office, Los Angeles, of the PPRs for the Yuma Auxiliary Project (Unit B) and the Valley Division of the Yuma Project, both in Arizona, and the Reservation Division of the Yuma Project in California. These documents were transmitted to the States by Reclamation on July 1, 1965, with emphasis on the need to exchange all available information.

The document illustrates the problem in determining PPRs. The above-named Federal reclamation projects were administered by Reclamation's Yuma Projects Office. However, in spite of the mass of records still available, there were no records existing in 1965 which would show the precise acres irrigated pre-June 1929, or the quantities of acre-feet of water applied to each parcel of land or to each farm unit. Another major problem was that of recreating events which had occurred over 30 years ago, and this was complicated by the fact that in nearly every instance of major PPR claims the current diversion points had been changed from the points used before June 25, 1929, so that the differences in transmission and conveyance losses became

matters of adjustment. For example, Imperial Dam was the diversion point for reclamation projects in the Yuma area, replacing Laguna Dam.

Nevertheless, the aforementioned document entitled "July 1, 1965, Data," attempted to provide both answers from an analysis which was made of water right applications (both filed and cancelled); finance ledgers; Annual Yuma Projects Histories; U.S. Geological Survey Water Supply Papers; exhibits in *Arizona* v. *California*; and miscellaneous Reclamation records. Since the largest number of acres irrigated were recorded in the 5-year period pre-June 25, 1929, the analysis concentrated in that period in order that PPR claims would be fully protected.

F.2.1 Yuma Auxiliary Project (Unit B), Arizona

This was the smallest and earliest reclamation project to check. It was possible to deduce from the above records for the Yuma Auxiliary Project, with a high degree of accuracy, the number of acres under water right applications which had paid minimum water charges and for excess water and were irrigated in each calendar year for the period 1923 to 1929, and the water duty in acre-feet per acre delivered to farms.

The Yuma Auxiliary Project, the smallest reclamation project, had the best acreage and water records. The records indicated, following a double cross-check process, that 1,165 acres under water right applications plus an additional 165 acres immediately adjacent to the boundaries of Unit B, or a total of 1,330 acres, were actually irrigated in calendar year 1929 on the Yuma Auxiliary Project. While there were no records of the quantities of water applied to the individual farm units, there were records showing that the largest number of acre-feet of water pumped for the whole of Unit B at the B-Lift Pumping Plant, which provided Unit B's water out of the Valley Division's East Main Canal, was 6,777 acre-feet in calendar year 1929, of which 4,187 acre-feet were delivered to the total number of farm units.

F.2.2. Reservation Division - Bard Unit and Valley Division - Yuma Project

A similar analysis was made for the Yuma Project which consists of the Valley Division in Arizona and the Reservation Division in California. The Reservation Division, in turn, is comprised of an Indian Unit and a non-Indian or Bard Unit. Since the Indian Unit of the Reservation Division had rights decreed to it in Article II(D)(3) of the Decree in *Arizona* v. *California*, it was necessary both to extrapolate the figures for the Bard, or non-Indian Unit, from those for the Reservation Division as a whole, and to make judgment decisions on the number of acres actually irrigated.

Water records of diversions for the Yuma Project were not broken down between the Valley and the Reservation Divisions in Arizona and California, respectively. (It must be recalled that it was not anticipated in the pre-June 25, 1929, era, in which these records were maintained, that a definition in 1964 would require reconstructing that type of record.) Nevertheless, an analysis was made by deducting from the diversions for both divisions of the Yuma Project; i.e., the Reservation Division in California and the Valley Division in Arizona, the quantities of water leaving the Reservation Division via the California Wasteway and returning to the river, and the quantities of water leaving the Reservation Division and delivered to the Colorado River Siphon for use in the Valley Division and Yuma Auxiliary Project in Arizona. This process provided the quantities of water used on the Reservation Division. The Bard Unit water figures were computed by subtracting therefrom the already decreed rights for the Indian Unit.

This indicated that on the Bard Unit (non-Indian), the largest number of acres irrigated pre-June 25, 1929, were 6,047 acres under water right application in calendar year 1924; but on a noncoincidental or cumulative basis; i.e., the acreage irrigated at any time and during any year prior to June 25, 1929, although without proof of its continued irrigation, the largest acreage was 6,215 acres. On the Valley Division these figures were 43,562 and 46,563 acres respectively.

The same process was used in the July 1, 1965, data for the lands in the Valley Division of the Yuma Project in Arizona. It was possible to compute the total quantities of water delivered to the Valley Division as a whole during each of the calendar years under review by using the quantities of water delivered through the Colorado River Siphon and deducting the quantities pumped to Unit B and the quantities

returned to the river. This process did not show the quantities delivered to the individual farm units. This approximated a water duty of 5.3 acre-feet per acre for the Valley Division and, since the records of crops produced as well as water used on the Reservation Division of the Yuma Project in California were similar to that on the Valley Division, a division of the water diverted from the Colorado River for each of the two segments of the Yuma Project was made, based on the percentage of the total irrigated acres. This analysis was deemed more reliable than the extrapolation of water figures above.

For the five calendar years of 1925 through 1929, the analysis showed a water use ranging from 80,847 acre-feet to 155,071 acre-feet in the Reservation Division and 163,283 acre-feet to 214,595 acre-feet in the Valley Division.

No comparable records were available for the North Gila Valley in Arizona or for the Imperial or Palo Verde Valleys in California, although North Gila Valley Irrigation District presented affidavits to the Arizona Interstate Stream Commission claiming that 3,428 acres were irrigated prior to June 25, 1929, and that 4,400 acres were irrigated in 1930.

It became obvious to the United States representatives that it would not be easy to reconstruct the precise areas of land that were irrigated nor the precise quantities of water utilized on these precise parcels of land before June 25, 1929 (see memorandum to Files from the Associate Solicitor, Water and Power, dated October 13, 1965, and letter of October 26, 1965, from the California Attorney General to the Solicitor General).

The difficulty of making precise PPR determinations prompted Interior's Solicitor to advise the Solicitor General of the Department of Justice on September 3, 1965, of the need for negotiation to resolve the problems involved. He stated there were "...many issues inherent in the present perfected right problem which cannot be resolved in legalistic, or readily definable terms...(but) will require negotiation and a certain amount of give and take on both sides...."

F.3 Records of Imperial and Palo Verde Irrigation Districts

Interior's representatives examined the water and financial records of Imperial Irrigation District on October 25, 1965, as well as the Imperial County Assessor records to see if irrigated acreages could be determined from the assessments. The records of the Palo Verde Irrigation District were also inspected. No records were available in either of the offices to show the precise parcels of land that were irrigated prior to 1929 nor the number of acre-feet of water delivered to such parcels. However, records were available at Imperial Irrigation District to show the total number of acre-feet of water diverted annually from the Colorado River, the number of acre-feet delivered to Mexico (through which the Alamo Canal passed before reentering the United States), the quantity returning to the United States, the total number of acre-feet delivered to farms in the district, the waste and unaccounted water, and the gross and net acres irrigated each year (see memorandum to Files from Assistant Regional Solicitor Nathanson, dated October 29, 1965). Since there is no return flow to the river, the diversion figure assumes more importance for Imperial Irrigation District.

The records of Palo Verde Irrigation District showed the annual diversions from the Colorado River, the return flow to the river, and the total acreage irrigated in 1926 and 1932 but there were no records of the exact number of acres irrigated in each of the years between 1926 and 1932, although no substantial change appears to have occurred in that interval.

F.4 Discussions with States

Preliminary general discussions were had by representatives of Interior and Justice with the Arizona Interstate Stream Commission on July 28, 1965, and with the California parties on October 7, 1965. Both States asked whether the United States would file PPR claims for the irrigation districts in the Yuma area and were informed that while the United States would prepare data thereon the States would be responsible for presenting their respective claims. The California parties were of the opinion that it was not physically possible to ascertain the precise acres of land that were irrigated pre-1929 because of lack of data, but that, in their opinion, it was unnecessary to do so since the PPR claims were owned by the districts such as Imperial Irrigation

District and Palo Verde Irrigation District and that any district water right was available for all the lands within each district. This raised the question of the effect on the PPR claims of the enlargement of the District's boundaries which have occurred since 1929 (see memorandum to the Solicitor from the Associate Solicitor, Water and Power, dated July 30, 1965, and a memorandum dated October 13, 1965, to the Files, respectively).

F.4.1. States Request for Extension of Time for Compliance with Decree

In its meeting with the United States on October 7, 1965, California advanced several reasons for an extension of time within which to comply with the 2-year requirement in Article VI of the Decree. First, it argued that there was a need to obtain Reclamation's reports under Article V(B) of the Decree, which requires the Secretary to provide complete, detailed and accurate records of diversions of water from the mainstream, return flow, and consumptive uses of such water stated separately as to each diverter, each point of diversion, and each of the States. Secondly, in contrast to the major diverters such as Imperial Irrigation District, it was difficult to identify miscellaneous diverters and to prove their pre-June 1929 diversions. And, third, legislation was then being considered in Congress in connection with the authorization of the Central Arizona Project which, if enacted, would impact Article VI of the Decree by providing a priority to present perfected rights and existing water contractors over the Central Arizona Project. Neither California nor the United States wanted to upset an amicable settlement of that issue. California's position on an extension of time was also presented in a letter of October 26, 1965, to the Solicitor General.

By letter of January 6, 1965, to Justice, Interior's Solicitor discussed the request for an extension of time and proposed, if acceded to, that it be conditioned upon a scheduled timetable for the completion of PPR determinations. No such timetable emerged, although a 1-year extension for compliance with Article VI was ordered by the Supreme Court on February 28, 1966.

F.5. United States List of PPR Claims

On January 14, 1966, Interior's Solicitor provided Justice with a list of PPRs of the Indian Reservations which itemized the number of acres in the Reservations within each State, the diversion quantities in acre-feet, appropriate priority dates, and a listing of PPR claims for the National Park Service. This list was the basis for the list provided to the Solicitor by the Regional Solicitor on December 16, 1966, and the list thereafter filed by Justice with the Supreme Court on March 9, 1967.

F.5.1. California's List of PPR Claims

A meeting with California representatives was held on April 4, 1966, at which California indicated PPR claims of 2.7 to 2.8 maf for the irrigation of 425,000 acres in Imperial Irrigation District; 208,100 acre-feet for the irrigation of 32,000 to 36,000 acres in Palo Verde Irrigation District; and 18,000 to 19,000 acre-feet for the Bard Unit for the irrigation of 5,928 acres. Claims for Needles and for riparian lands were also discussed. California urged adoption of the diversion less return figures in United States Geological Survey Water Supply Paper No. 1049.

F.6 Format of PPR Statement

At a meeting of all the parties on July 11, 1966, a draft of a statement of the priorities for the major water user PPR claimants prepared by the Department of Justice was distributed. The PPRs were stated in a form similar to that used in Article II(D) of the Decree for the Indian Reservations; i.e., the lesser of either a specific quantity of water diverted from the mainstream or the number of acre-feet (unspecified) of mainstream water necessary to supply the consumptive use required for the irrigation of a stated number of acres and for related uses as of a given priority date.

The States objected to the PPRs being stated in terms of a dual limitation and urged the adoption of a single diversion figure. Their reasons were that the rights of the Indian Reservations were not based on actual water use but on the intention that water was reserved for later use, whereas non-Indian PPR claims required the actual use of water, that the dual limitation created uncertainty as to the extent of the right, and that it was difficult to administer. This position paralleled that taken at the prior meeting of April 4, 1966. They also objected to the inclusion of a reference to the precise number of irrigated acres.

A significant determination was made at this meeting by the Department of Justice. Because of the lack of records in Imperial Irrigation District and Palo Verde irrigation District, the two major California PPR claimants, which would identify each irrigated acre pre-June 25, 1929, Justice acquiesced in the States view that the "defined area of land" to which water had to have been applied pre-June 25, 1929, could be viewed as the lands within the exterior boundaries of the District (see memorandum from Reclamation's Regional Supervisor of Irrigation to the Regional Director dated July 18, 1966). This position was later attacked by the Indians as part of their opposition to a stipulated settlement.

The States further suggested they would not object if the PPRs of the Indian Reservation were stated in terms of a single diversion figure and if the dual limitation therefor and the reference to a specific number of acres were dropped. The States later receded from that view.

Since Justice's draft stipulation indicated the possibility of more than one priority date for Imperial Irrigation District, the District stated it would accept a 1901 priority date for its PPRs, the year in which Colorado River water was first delivered to Imperial Valley lands. That same year was acceptable to Arizona districts for their claims. Palo Verde Irrigation District indicated it would check its priority date.

It was concluded that the States would prepare their own draft stipulation and lists of PPR claims within their States.

F.6.1. California's Draft of Priorities

On October 7, 1966, California submitted its draft of Stipulation of PPR claims. It used a single consumptive use figure which was applicable district-wide for Imperial Irrigation District and Palo Verde Irrigation District, but stated that the Bard Unit claims were based on landownerships of farm units.

Reclamation expressed disappointment at the State's rejection of the alternative, dual form provided in the United States draft of PPR claims which would equate non-Indian PPRs with the PPRs of the Indian Reservations as provided in Article II(D) of the Decree and the fact that the Bard Unit's PPR claim was based upon separate priorities for each individual ownership rather than assigning the priority on a district-wide basis as was done for Imperial and Palo Verde Irrigation Districts (see letter of Regional Director, Reclamation, to California Attorney General, dated November 17, 1966). This difference of opinion continued to be a major reason for failing to make progress on a stipulated form of Decree.

F.6.2. Efforts to Agree on PPR Statement

At meetings on December 13 and 14, 1966, no progress was made on the use of the dual limitation and it was concluded that, in compliance with amended Article VI of the Decree, each party would file its own PPR claims with the Supreme Court on or before March 9, 1967. Representatives of the BIA attended these meetings and reported thereon to the Commissioner of Indian Affairs on December 12, 1966.

By memorandum of December 16, 1966, the Regional Solicitor furnished the Deputy Solicitor with a list of Indian Reservation PPRs with a segregation of the quantities of water allocated by States and stated in terms of a dual limitation. The breakdown was worked out with the Bureau of Indian Affairs, Phoenix Area Office.

By letter of December 20, 1966, to Interior, Justice stated its understanding of the prior PPR meetings with the States and the decision that the United States would present claims (to be initially prepared by Interior) for the Federal Reclamation Projects (but not for Imperial or Palo Verde Irrigation Districts) using the alternative or dual formula with priority dates related to water filings and Notices of Appropriation by the United States for the several projects. The acreages would be cumulative; i.e., the total of all the lands ever

receiving water pre-June 25, 1929, and the water quantities claimed would be the amounts diverted less the amounts of wasted water.

In response thereto, on January 13, 1967, the Regional Solicitor, Los Angeles, provided the Deputy Solicitor with a proposed Stipulation of PPRs for the Valley Division of the Yuma Project, the Yuma Auxiliary Project (Unit B), and North Gila Valley in Arizona, and for the Reservation Division of the Yuma Project in California. The rights were stated in the alternative or dual limitation and used much of the background material set out in the aforementioned July 1, 1965, data. The PPRs were also stated in terms of both a 3 and 5 year average prior to June 25, 1929, which had not been done in the July 1, 1965, data. Another principal difference was the use of water figures for each month; e.g., for the 12 months ending June 30, 1929, rather than calendar year figures, because of the June 25, 1929, cutoff date in the Decree. Also, in lieu of using the measured quantities of water diverted from the mainstream, the measurements were taken at the point (or its equivalent) where the water was measured in the pre-June 25, 1929, period. The reason therefor was to avoid complex engineering determinations and apportionments of losses of water between water user entities which shared common diversion facilities. A narrative explanation was provided as to the basis for the water figures.

In brief, the acreage claimed for the Valley Division, Yuma Project, was 46,563 acres and 248,000 acre-feet of water measured at the Colorado River Siphon; 1,165 acres and 6,395 acre-feet of water measured at the Unit B headworks for Unit B; and 33,000 acre-feet of water measured at the Reservation Division turnouts for 6,125 acres for the Bard Unit.

By letter of January 20, 1967, Interior's Solicitor furnished the Solicitor General with a list of PPR claims for the Indian Reservations prepared by Interior which departed from the Article II(D) Decree listing of the total acres of irrigated land and acre-feet of water in each Reservation by breaking these down according to the number of acres in each State and the quantities of water associated therewith. However, the totals for all the rights in all of the States were identical with the Decree totals of 905,496 acre-feet for 136,636 acres. The PPR claims for the Federal reclamation projects were stated in the alternative. With reference to the States position of using a single diversion figure in lieu of a dual limitation, the Solicitor stated:

"If the non-Federal parties should obtain a description of their present perfected rights in terms of diversions alone, we will want to assert that Indian rights must be treated in the same fashion.

• • •

"...we have treated, for present purposes, the list of 'Federal establishments' in the decree as exclusive."

On February 9, 1967, the Regional Solicitor's Office prepared a detailed analysis of the information available relating to the establishment of priority dates of the PPRs of the Federal establishments and for the Imperial irrigation District. This indicated that the latter's rights were tenable if premised on a nonstatutory method of appropriation (diversion and use of water) rather than on the notices of appropriation because of failure of the District's predecessor to commence construction within the statutory 60-day period of filing a notice of appropriation.

The PPR claims for the reclamation projects, stated in terms of a dual limitation, were 6,801 acre-feet for 1,165 acres within the Yuma Auxiliary Project and 60 acres adjacent thereto; 39,426 acre-feet for 6,215 acres within the Reservation Division; 297,800 acre-feet for 46,563 acres in the Valley Division; and 31,840 acre-feet for North Gila Valley for 5,000 acres. All the above diversions were to be measured at Imperial Dam and had a July 8, 1905, priority date. A narrative justification of each claim was also provided.

G. Claims of Present Perfected Rights Filed With Supreme Court

On March 9, 1967, Justice filed with the Supreme Court its "List of Present Perfected Rights Claimed by the United States." The claims were essentially in the dual limitation form provided by the Regional Solicitor's Office to the Solicitor on February 15, 1967. The list is set out in Appendix 1001.

Likewise, on March 9, 1967, California filed its list of California PPR claims with the Supreme Court, "except those relating to Federal establishments." The major claims, stated in terms of a single consumptive use figure, were 2,806,000 acre-feet for lands within the boundaries of Imperial Irrigation District with a priority date of 1895; 208,100 acre-feet for lands within the boundaries of Palo Verde Irrigation District with a priority date of 1877; and 21,162 acre-feet for the entries and areas irrigated in the Reservation Division, non-Indian

portion, with a priority date of 1905. Eighteen miscellaneous claims were filed for approximately 4,145 acre-feet of water. The California list is set out in Appendix 1002.

Arizona's list of PPR claims, set out in Appendix 1003, comprised:

Yuma Project, Valley Division	279,378 acre-feet for	46,563 acres
Yuma Project, Unit B	7,350 acre-feet for	1,225 acres
No. Gila Valley Irrigation District	31,840 acre-feet for	5,000 acres
Cibola Valley	27,706 acre-feet for	4,763.66 acres
Miscellaneous Claims	45,084 acre-feet	
Supplementary Claims	8,000 acre-feet	
	399,358 acre-feet	

A priority date for the Valley Division was claimed as of 1890 or, in the alternative, as of various dates ranging from 1891 to 1905 based on different notices of appropriations. July 8, 1905, was the claimed priority date for North Gila Valley Irrigation District and the Yuma Auxiliary Project-Unit B.

Nevada filed a statement that it asserted no PPRs.

The following table summarizes the Indian PPR claims and non-Indian PPR claims:

CLAIMS OF
INDIANS' PRESENT PERFECTED RIGHTS

	California		Arizona		Nevada		TOTALS	
	A/F	Acres	A/F	Acres	A/F	Acres	A/F	Acres
Yuma	51,616	7,743					51,616	7,743
Fort Mohave	13,698	2,119	27,969 68,447	4,327 10,589	12,534	1,939	122,648	18,974
Chemehuevi	11,340	1,900					11,340	1,900
Cocopah			2,744	431			2,744	431
Colorado River	10,745 40,241 3,760	1,612 6,037 564	358,400 252,016 51,986	53,768 37,808 7,799			717,148	107,588
	131,400	19,975	761,562	114,722	12,534	1,939	905,496	136,636
	131,400	Indian PPR	761,562	Indian PPR	12,534	Indian PPR	905,496	Indian PPR
	3,039,407.7	Other PPR	399,358.52	Other PPR			3,438,766.22	Other PPR
	3,170,807.7		1,160,920.52		12,534		4,344,762.22	

Total Combined Indian and State Claims

4,344,262.22

G.1 United States Analysis of States Claims

On June 19, 1967, Reclamation's analysis of the States PPR claims utilizing available aerial photographs indicated that of Arizona's Cibola Valley and of California's miscellaneous claims totalling 4,146 acre-feet, only 2,873 acre-feet were supportable.

On October 11, 1967, the Regional Solicitor provided the Deputy Solicitor with his analysis of the States claims and noted the problems posed by the different interpretations of the Decree used by the States. For example, California asserted for "the defined areas of land" the entire area within the boundaries of the irrigation districts which, in the case of Imperial, was 905,559 acres in 1956 or more than double the 424,000 acres irrigated pre-1929, and in the case of Palo Verde, was 104,000 acres in 1964 or more than triple the 32,523 net acres irrigated pre-1929. By contrast, the PPR claims of the United States for the Federal reclamation projects specified the precise number of acres of land within the boundaries of each project which had in fact been irrigated pre-1929 and not the total number of acres within the projects. The United States had assumed that the irrigation districts PPR claims would be limited by reference to the acreage irrigated rather than district boundaries.

The district-wide approach used by California for the Imperial and Palo Verde Irrigation Districts was not used for the Bard Unit, whose claim was limited to the owners of individual entries and areas. The same "district" approach was used for the California miscellaneous claims with incongruous results; e.g., 273 acre-feet for 10,880 acres of land owned by the A. T. and S. F. Railway. Further, Reclamation could accept only 2,873 acre-feet of California's 4,146 acre-feet of claims.

California also used a consumptive use water figure for Imperial Irrigation District based on the full calendar year 1929, its calendar year of highest water use, even though the Decree had a June 25, 1929, cutoff date. Palo Verde used calendar year 1925, its calendar year of highest use. In contrast, the United States averaged the water use over a 5-year period which, if done by California, would have produced claims for lesser water quantities than were listed, as would the use of the 12 months period from July 1, 1929, through June 30, 1929, for Imperial Irrigation District. An analysis of each of these claims follows.

ANALYSIS OF CLAIM OF PRESENT PERFECTED RIGHT
FOR IMPERIAL IRRIGATION DISTRICT

12 Mo. Periods July thru June 1924 thru 1929	Diversions at Rock-wood Gate for IID[1]	Deliveries to Mexico[2]	Diversions for IID (Less Deliveries to Mexico)	Difference Between IID Claim of PPR for CY 1929 and Each 12 Mo. Period Shown
July 1924-June 1925	3,001,500	695,543	2,305,957	(-500,043)
July 1925-June 1926	3,179,300	704,795	2,474,505	(-331,495)
July 1926-June 1927	3,033,310	629,425	2,403,885	(-402,115)
July 1927-June 1928	3,189,500	638,793	2,550,707	(-255,293)
July 1928-June 1929	3,332,500	678,434	2,654,066	(-151,934)
3 Year Average	3,185,103	648,884	2,536,219	(-269,781)
5 Year Average	3,147,222	669,398	2,477,824	(-328,176)
Jan. 1929-Dec. 1929 (IID claim of PPR based on *full* calendar year 1929)	3,424,000	618,000	2,806,000	

[1]Source - Geol. Surv. Water Supply Paper 1049, pp. 63-69
[2]Source - Intl. Bound. Comm. Letter to Reg. Dir. B. of R. 6-25-51

ANALYSIS OF CLAIM OF PRESENT PERFECTED RIGHT
FOR PALO VERDE IRRIGATION IRRIGATION DISTRICT

12 Mo. Periods Jan 1925 thru June 1929[1]	Diversions at Intake[2]	Estimated Waste Water	Net Diversions[3]	Difference between P.V. claim of PPR for CY 1925 and each 12 Mo. Period shown
Jan. 1925-June 1925	118,290	10,780	107,510	
July 1925-June 1926	214,050	19,180	194,870	(-13,230)
July 1926-June 1927	205,910	19,640	186,270	(-21,830)
July 1927-June 1928	200,760	22,400	178,360	(-29,830)
July 1928-June 1929	175,860	20,940	154,920	(-53,180)
3 year average			173,153	(-34,947)
4½ year average			182,631	(-25,469)
Jan. 1925-Dec. 1925 (Palo Verde Claim of PPR Based on Full cal. yr 1925)	225,700	17,600	208,100	

[1]Figures for second half 1924 not available.
[2]Geological Survey Water Supply Paper 1049, pp 33-34.
[3]The figures for diversions at intake less wastewater returned to river are estimated by District and do *not* include drainage water returned to river.

The Regional Solicitor also pointed out that the use of acreage figures for acres irrigated at any time in any year pre-1929, rather than the largest number of acres irrigated in a single 12-month period; i.e., the so-called "cumulative" approach, would only increase the acreages beyond the largest number of acres irrigated in any single year or in any 12-month period and also would increase the claimed water duty for the increased acreage. It was therefore urged that the cumulative approach be discarded as erroneous since the Regional Solicitor had used it initially in the July 1, 1965, data only for the purpose of exploring its validity and as a check on the other studies.

Differences were also noted regarding Arizona's PPR claims. While using the acreage figures that Interior had developed and Justice had shown in its PPR listing, Arizona used different water figures for the Valley Division of the Yuma Project. More significant was Arizona's omission of "whichever is less" in the alternative or dual limitation formula used by the United States.

The Regional Solicitor's analysis was critical of the use of pumped ground water as the basis of some of the miscellaneous claims and raised the question of their abandonment as well as other problem areas involving each of these claims. Further, it was pointed out that Reclamation could accept only 3,924 acre-feet out of Arizona's miscellaneous claims of 79,996 acre-feet.

G.2. Meeting of October 31, 1967

At this meeting, Justice questioned California's priority dates for Imperial and Palo Verde Irrigation Districts but no progress was made on an agreement. However, California repeated its prior willingness to removal of the acreage references from the Indian Reservations' dual limitation.

It was agreed that each party would prepare two documents: (a) formulate and exchange (but not file with the Court) not later than January 15, 1968, its formal objections to the PPR claims of the other parties; and (b) compute the PPR claims of all parties. These would be exchanged (see Regional Solicitor's memoranda to the Solicitor dated November 14 and 30, 1967).

The November 14, 1967, memorandum by the Regional Solicitor provided the Solicitor with a detailed legal analysis of the term "present perfect right." It discussed the nature and basis of a "water right," which is what a "present perfected right" is, as well as the rule of "beneficial use" and "reasonble use." This memorandum emphasized that "diversions less returns" did not accord with the Decree definition of PPRs, which is "a water right acquired in accordance with State law..." and should be the quantity of water reasonably acquired for beneficial use on the acreage to which the claim relates.

The November 30, 1967, memorandum of the Regional Solicitor was accompanied by the aforementioned two documents; "A" (United States objections to the Lists of PPRs of Arizona and California) and "B" (the United States version of the PPRs in Arizona and California) called for at the meeting of October 31, 1967.

G.3. Supreme Court Action Postponed

On December 1, 1967, the Solicitor General advised the Clerk of the Supreme Court of the Status of the Negotiations and stated his assumption that the Court would not act on the claims which had been filed with the Court absent application by one or more of the parties. The Clerk's response presumed that the Court could proceed *sua sponte*, but was sure the Court would notify the parties if it intended to do so.

G.4. Exchange of Parties Objections to PPR Claims of Other Parties and Their Restatement of all Claims

On January 9, 1968, Interior's Solicitor transmitted to the Attorney-General the attachments "A" and "B" which the Regional Solicitor at Los Angeles had provided with his aforesaid memorandum of November 30, 1967. These provided a detailed review of the PPR claims including the objections of the United States to each claim. On January 15, 1968, the Solicitor General furnished these two memoranda to the three States.

On January 8, 1968, California provided its versions of attachments "A" and "B," reiterating its adherence to the statement of PPRs in terms of a single consumptive use figure on a noncoincidental basis (or "cumulative" approach) and the desirability of a negotiated settlement. The use of the "noncoincidental basis" resulted in the enlarged claims predicted by the Regional Solicitor's memorandum of October 11, 1967. The increases from the prior California PPR claims listed and filed with the Supreme Court on March 9, 1967, were:

Imperial	from	2,806,000 acre-feet to	3,086,600 acre-feet
Palo Verde	from	208,100 acre-feet to	241,400 acre-feet

California also objected to the "consumptive use" figures used by the Arizona claimants and to some of the priority dates; e.g., Valley Division, and alleged that most of the miscellaneous claims had been lost by forfeiture or abandonment. California also objected to the United States statement regarding the PPRs for the Indian Reservations, and provided its own figures of the consumptive use requirements. On January 12, 1968, the Regional Solicitor requested the views of the Phoenix Area Office, BIA, on those comments. BIA's reply of January 25, 1968, criticized California's consumptive use approach which assumed only 3.5 acre-feet per acre.

On January 28, 1969, Arizona filed its statements "A" and "B" with the other parties. It objected to California's "noncoincidental use basis" as without legal basis; asserted California's failure to follow the Decree definition of PPRs; and was critical both of the claims and of the priority dates for Imperial and Palo Verde. It suggested a statement for PPR claims which would name a specific number of acres of specifically defined land but avoided the dual limitation urged by the United States.

On April 7, 1968, Nevada filed its position. It objected to the "noncoincidental use theory"; to the lack of beneficial use figures; and to all the claims filed by each of the parties. It adopted much of the reasoning used in the analysis of the United States.

H. Formation of a Fact Finding Committee

On March 20, 1968, following its suggestion at a joint meeting of March 12, 1968, California proposed the formation of a Fact Finding Committee to review all PPR claims. The States and the United States accepted the proposal and Milton N. Nathanson, Assistant Regional Solicitor, Department of the Interior, Los Angeles, the Solicitor's representative, was named chairman. It was the Solicitor's understanding, as expressed in a letter of May 21, 1968, to Justice, and that of Justice, as expressed in a letter of June 4, 1969, to the parties, that the Committee's assignment is limited to the facts concerning the PPR claims and "...is not to include the decreed rights listed in Article II(D) of the Decree..." which included the PPRs of the Indian Reservations. Hence, this area was outside the Fact Finding Committee's jurisdiction.

The Committee agreed that it would gather information on diversions, return flows, consumptive use computations or estimates, acreages, dates of notices of appropriations or water use, and relevant State law. Each party would direct questions or requests for data to any other party, with copies of the requests and answers to be available to all parties.

H.1. Questions Posed by Fact Finding Committee Members

On January 9, 1969, the United States representative directed a series of questions to California for the Imperial Irrigation District and Palo Verde Irrigation District; for the Bard Unit and any other California PPR claimant; and to Arizona for the North Gila Valley Irrigation District, Yuma Auxiliary Project (Unit B), the Yuma County Water Users' Association, and miscellaneous claimants.

The United States questions related to the quantities of diversions from the mainstream, waste and losses, return flows, gross and net acres irrigated, quantities of water delivered to farms, the date when diversion facilities were constructed, the dates of initial diversions, and any other pertinent information.

These questions were amplified by letter of February 17, 1969, for miscellaneous PPR claimants as to the basis for the claim and priority date, the diversion facilities, acreages, crops produced, and the use of water pumped from wells. By letter of January 13, 1969, the Arizona Interstate Stream Commission asked counsel for the Arizona irrigation districts to respond.

By letter of January 13, 1969, Nevada's counsel requested that, in addition to the data the Fact Finding Committee indicated it would gather, the parties should provide information on water use after June 25, 1929, so that the validity of objections based on abandonment could be evaluated.

By letter dated February 14, 1969 (sic), Arizona asked that, in addition to the information requested by the United States, Imperial Irrigation District provide, among other things, data for 1923-1929 on losses of water in transportation attributable to the Mexican and United States deliveries and the flows into the Salton Sea.

By letter of January 14, 1969, Arizona also requested the information called for by the United States and, in addition, the acreage irrigated by direct diversion or pumping from the river and by pumping from wells, and the amounts of water used for municipal and industrial purposes.

By letter of January 15, 1969, California directed a series of questions to the United States regarding the Federal establishments, and to Arizona regarding the irrigation districts' PPR claims, and a separate series of questions for miscellaneous PPR claimants. The questions involved both the water use; i.e., diversions, measured and unmeasured return flows, acreages and ownership, cropping patterns, consumptive use figures, notices of appropriations, the basis of priority dates, and data pertaining to pumping from wells.

On January 20, 1969, the United States declined to respond to California's inquiry of January 15, 1969, on Federal establishments for the reason that the information requested was outside the scope of the Committee's functions as prescribed in both Interior's and Justice's aforenoted limitation and was already covered by the Decree.

On January 30, 1969, California responded in part as to Bard Irrigation District.

On February 18, 1969, the United States responded to California's questions regarding the Federal reclamation projects in Arizona and California.

On March 3, 1969, the Chairman of the Committee provided a progress report on the status of the questions posed and the answers provided by each of the parties, and noted that thus far the United States had responded to California's inquiry and California had replied, in part, to the United States questions regarding Bard. This was followed by another status report of July 22, 1969, which noted that no additional responses had been received.

On August 1, 1969, Arizona provided answers to California's questions regarding Arizona's eighteen miscellaneous PPR claims.

On August 14, 1969, Imperial Irrigation District provided answers to the questions asked by the United States on January 9, 1969, and by Arizona's inquiry of January 14, 1969. These included records of diversions from the mainstream for 1923-1969; breakdown of the quantities of water wasted, lost in sluicing, lost by evaporation, and all other losses of water in Mexico and in the United States; the quantity of water delivered to users in Mexico 1923-1929; the gross and net acres irrigated in both countries in the period 1923-1929; the quantities of water returned from Mexico and delivered to the United States; the quantity of water delivered to users in the United States; return flows; date of construction of diversion facilities; and the date diversions began.

On August 18, 1969, California provided a further response regarding Bard Irrigation District and noted the difficulty in answering the United States questions regarding miscellaneous PPR claims.

Palo Verde Irrigation District responded on September 3, 1969.

I. Preparation of "Compromise PPR Statement"

Following discussions between the Solicitor's Office and Reclamation in Washington on November 4, 1969, and in Boulder City on November 20, 1969, and pursuant to a request therefor as a means of compromising the existing impasse between the parties on PPRs, the Regional Solicitor's Office on December 15, 1969, provided Reclamation with drafts of statements designated "Reg. Sol. Draft 12-15-69" for the major PPR claimants in Arizona and California. (The statement actually had been drafted jointly by Reclamation and the Regional Solicitor's Office prior to that date.) It recited the California claims for Imperial and Palo Verde Irrigation Districts, the apparent rationale therefor, such as the acreage irrigated and the quantity of water used, the later enlarged claims, the rationale for the claims for the Federal reclamation projects, the United States objections to the States claim, and a statement and rationale therefor of the extent of each claim which would be acceptable to the United States and which were premised on a water duty of approximately 5.6 acre-feet of water per irrigated acre. An effort was made therein to place all PPR claimants on an equal basis. A summary tabulation of the proposed compromise claims follows:

	State Claims (March 1967)	State Informal Revised Claims (Jan. 8, 1969)	U.S. Listed Claim (March 1967)	U.S. Proposed Compromise Claim
California				
Imperial Irrigation District	2,806,000 acre-feet within boundaries of IID - priority date - 1895	3,086,600 acre-feet (no other change)	None	Consumptive use of 2,483,000 acre-feet with priority date of 1901
Palo Verde Irrigation District	208,100 acre-feet within boundaries of Palo Verde Irrigation District - priority date - 1877	241,400 acre-feet (no other change)	None	Consumptive use of 182,000 acre-feet with a priority date of 1877

	State Claims (March 1967)	State Informal Revised Claims (Jan. 8, 1969)	U.S. Listed Claim (March 1967)	U.S. Proposed Compromise Claim
California				
Reservation Division, Yuma Project, California (non-Indian claims	21,162 acre-feet with priority date of 1905 (diversion requirement not less than 42,325 acre-feet)	22,400 acre-feet (no other change)	(i) 39,561 acre-feet of diversions measured at Imperial dam *or* (ii) the quantity necessary to supply consumptive use for irrigation of 6,215 acre-feet within boundaries of Division as of June 25, 1929, and satisfaction of related uses, *whichever is less*, with priority date of July 8, 1905	Consumptive use of 34,804 acre-feet with a priority date of July 8, 1905
Arizona				
Valley Division, Yuma Project	279,378 acre-feet on 46,563 acres within boundaries of Valley Division, with priority date of October 23, 1890, June 8, 1897, March 24, 1898, January 18, 1902, and July 8, 1905	none	(i) 299,852 acre-feet of diversions measured at ID or (ii) the quantity necessary to supply the consumptive use required for the irrigation of 46,563 acres within boundaries of Valley Division as of June 25, 1929, and the satisfaction of related uses, *whichever is less*, with a priority date of 1890, June 8, 1897, January 18, 1902, and July 8, 1905	Consumptive use 244,000 acre-feet with a priority date of 1901
North Gila Valley Unit, Yuma Mesa Division	31,840 acre-feet or that quantity necessary to irrigate 5,000 acres of land with a priority date of July 8, 1905	none	(i) 31,994 acre-feet of diversions measured at ID *or* (ii) the quantity necessary to supply the consumptive use required for the irrigation of 5,000 acres within boundaries of North Gila Valley Irrig. District as of June 25, 1929, and the satisfaction of related uses, *whichever is less*, with a priority date of June 8, 1905	Consumptive use of 28,000 acre-feet with a priority date of July 8, 1905
Yuma Auxiliary, Project, Unit B	6,801 acre-feet on 1,225 acres with priority date of July 8, 1905	none	(i) 6,801 acre-feet of diversions measured at ID or (ii) the quantity necessary to supply consumptive use required for the irrigation of 1,165 acres within boundaries of Project and 60 acres adjacent thereto as of June 25, 1929, and for the satisfaction of related uses, *whichever is less*, with a priority date of July 8, 1905	Consumptive use of 6,800 acre-feet with a priority date of July 8, 1905

It was noted that while the final figures were less than the States claims, they were defensible and, if they were to be revised, lower figures could be equally defended.

A significant fact in the "compromise" was the acceptance by a new Deputy Solicitor of Reclamation's adoption of the concept that had always been urged by the States as to the statement of the PPR claims in terms of a single diversion figure rather than in terms of the dual limitation used in Article II(D) of the Decree for the Indian Reservation.

This occurred in the fall of 1969 following the departure from Interior of then Solicitor Weinberg and Associate Solicitor Hogan. Justice, however, did not drop its adherence to a statement of the non-Indian PPRs in a format similar to the dual limitation used for the Indian Reservation.

The draft statement rationale of "12/15/69" was modified and redesignated "1-19-70" as a result of a Washington Office request that the compromise PPR claims be stated in quantities generally based upon 6 acre-feet per irrigated acre of diversions from the mainstream rather than 5.6 acre-feet. This caused the following increases in the States PPR claims which were stated in terms of a single diversion figure:

California:

Imperial Irr. Dist.	from	2,483,000 acre-feet	to	2,600,000 acre-feet
Palo Verde Irr. Dist.	from	182,000 acre-feet	to	200,000 acre-feet
Reservation Division	from	34,804 acre-feet	to	37,300 acre-feet

Arizona:

Valley Division	from	244,000 acre-feet	to	261,400 acre-feet
No. Gila Valley Unit	from	28,000 acre-feet	to	30,000 acre-feet
Yuma Auxiliary Proj.	from	6,800 acre-feet	to	6,800 acre-feet

(See Regional Solicitor's covering letter of January 20, 1970, to Reclamation.)

The Regional Solicitor's letter noted that the diversion figures used in the statements were essentially the product of administrative rather than legal evaluations or determinations and repeated the earlier view that, while the water use figures were generally less than those in the States claims, even lower figures could be justified.

The draft statement of "12-15-69", revised "1-19-70", was further modified 1-26-72 and 1-28-72 to eliminate all references to the background and basis of each claim as filed with the Supreme Court, the enlarged claims later filed informally with the parties, and the objections of the United States to each claim.

Because Interior had dropped its insistence on the dual limitation, the Regional Solicitor advised the Associate Solicitor on January 27, 1970, of the relationship between the prospective non-Indian PPR claims and the water rights then established for Indian Reservations; the impact of the use of a single diversion figure for the pending non-Indian PPR claims on the dual limitation provided in the Decree for the Indian Reservations; and the possible impact on the water supply for the Central Arizona Project if a single diversion figure was used for the Indian Reservation.

Reclamation Initiative in Compromise PPR Statement

Reclamation took the initiative in furthering the progress of negotations on PPRs. At a November 5, 1969, meeting with Justice's attorneys at which the draft compromise statement (later designated "12/15/69") was discussed, it was understood that no figures were to be communicated to the non-Federal parties until approved by Justice, but that in the meantime efforts should be made to resolve the miscellaneous claims. Unfortunately, Justice neither formally approved nor disapproved the figures in the draft statement and a subsequent meeting between Reclamation and Justice did not occur until November 10, 1970,or 1 year later.

At a meeting of November 10, 1970, with Reclamation, Justice argued for the dual limitation on the non-Indian PPR claims but agreed that Reclamation could contact the parties but only after advising them that

Justice still adhered to the dual limitation statement of priorities and that Reclamation could not commit the United States to a stipulated settlement on any other basis (see memoranda of November 13, 1970, and June 3, 1971, from Chief, Division of Water and Land Operations, to Commissioner of Reclamation).

The United States "compromise" figures were discussed by Reclamation with the parties. The Colorado River Board of California had developed new figures of maximum annual diversions prior to June 25, 1929 (see the Board's memorandum dated January 29, 1971, to Mr. Ely), which, with the modifications shown, they recommended be accepted. There were:

	Reclamation's figures	Col. River Bd. 1/29/71	Col. River Bd. 4/16/71
Imperial Irr. Dist.	2,600,000 af	2,714,000 af	2,600,000 af
Palo Verde Irr. Dist.	200,000 af	219,800 af	219,800 af
Reservation Div. (Bard)	37,300 af	30,400 af	40,400 af
Yuma Project, Valley Div.	261,400 af	254,200 af	254,200 af
Yuma Auxiliary Project	6,800 af	6,800 af	6,800 af
No. Gila Valley Irr. Dist.	30,000 af	22,000 af	22,000 - 30,000 af

The Arizona PPR claimants also accepted the "compromise" figures (see letter of June 14, 1971, from Valley Division to Reclamation and letter of August 23, 1971, from the California Attorney General to Bard Irrigation District).

J. Miscellaneous Claims

On June 15, 1970, Arizona advised all its miscellaneous PPR claimants as to which claims its own investigations could support and which claims the United States could accept. Four claims were accepted in their entirety for a total of 493 acres. Ten claims were wholly unacceptable to the United States, of which eight were unacceptable to Arizona. Five claims were supportable in part by Arizona, four of which the United States could support in part. Of the total Arizona miscellaneous PPR claims for 11,430 acres, the United States could support claims for 1,063 acres and Arizona for 1,328 acres. By letter of June 14, 1971, to the Regional Solicitor, Arizona attempted to explain the discrepancy between the two views.

Discussions continued between the parties in a further effort to resolve these differences.

A memorandum of July 23, 1971, from the Colorado River Board to the Attorney General's Office discussed the background of the PPR claims for the city of Needles. A memorandum to the files dated December 31, 1971, from the Chief Engineer, Colorado River Board, explained the basis for the derivation of a PPR claim of 1,500 acre-feet of diversions and a consumptive use of 950 acre-feet for the city of Needles.

Between August 23, 1971, and November 23, 1971, there was an exchange of correspondence between Bard Irrigation District of California and the California Attorney General in which Bard questioned California's presentation of its PPR claim in terms of individual ownerships and entries in contrast to its presentation of the claims for the Imperial and Palo Verde Irrigation Districts in the Districts' names. The Attorney General's Office response was that Bard thereby enjoyed an advantage in maximizing its claim which is not available to the other districts.

A letter from the Colorado River Board of California to Reclamation dated October 4, 1971, discussed the State's efforts to resolve their miscellaneous claims. A copy of California's summary thereof follows:

STATUS OF CALIFORNIA MISCELLANEOUS
PRESENT PERFECTED RIGHT CLAIMS

Claimant	California 1967 Claim	U. S. Position	CRB ANALYSIS Support[1]	Under Investigation	Tributary	Lost Approp. Right
			(Quantities in Acre-Feet per Year)			
Needles	2,000 cons. use	700 cons. use	1,500 Div.			
AT&SF	273 cons. use	273 cons. use	1,260 Div.[4]			
Desert View Mines	10 cons. use	0 cons. use				[2]
Pat Mines	80 cons. use	0 cons. use				[2]
Total	2,363 cons. use	973 cons. use				
			QUANTITIES IN IRRIGATED ACRES			
Wavers	148	130	130 to 148			
Stephenson	100	0	40 to 60			
Bleiman	40	0			40[3]	
Mendivil	20	0	20			
Grannis	30	0		30		
Morgan	25	0	25			
Milpitas (Sec. 14)	18	0		18		
Simons	10	3	10			
Fewell	18	0		18		
Colo. R. Sport.	16	0	16			
Milpitas (Sec. 1)	11	0		11		
Andrade	11	0	11			
Reynolds	6	5	6			
Bosworth	7	0			7[3]	
Cooper	10	0		10		
Total	470	138	258 to 296	87	47	

[1]Tentative support subject to effect of additional evidence and further study.
[2]Apparent loss of appropriate right. Attorney General's Office is making a reevaluation of evidence.
[3]Apparently not a mainstream source, but declaration would be a Department of Interior responsibility.
[4]Claim also will include 273 acre-feet per year of consumptive use.

Meetings were held by Reclamation with the three Lower Basin States in October 1971. The differences of opinions on each of the miscellaneous claims were set out in a memorandum of November 1, 1971, to the Assistant Regional Solicitor, Los Angeles, from Reclamation's Chief, Division of Water and Land Operations. This was formalized in a memorandum of November 4, 1971, to the Commissioner of Reclamation. The memorandum noted the need for condensing and updating the "1-19-70" draft of rationale for the major claims as well as the need for a justification requested by Justice for using a single diversion figure rather than the dual limitation in stating the claims.

On January 7, 1971, Reclamation's Regional Director's Office summarized the status of each of the miscellaneous PPR claims in Arizona and California and noted that the lack of adequate records of quantities of water actually used had led to the adoption of a diversion rate of 6 acre-feet per acre of land irrigated. A narrative explanatory statement was included. Reclamation's study showed that Arizona now claimed 8,858 acre-feet for the irrigation of 1,343 acres, which included 800 acre-feet for the city of Yuma. This was a reduction from initial claims for 66,000 acre-feet of water. The United States appeared favorably disposed to 5,933 acre-feet for 600 acres, which included 2,333 acre-feet for the city of Yuma. The United States was receptive to 90 acre-feet for 15 acres in Cibola Valley.

STATUS OF CALIFORNIA MISCELLANEOUS
PRESENT PERFECTED RIGHT CLAIMS

Claimant	California 1967 Claim	U. S. Position	CRB ANALYSIS Support[1]	Under Investigation	Tributary	Lost Approp. Right
		(Quantities in Acre-Feet per Year)				
Needles	2,000 cons. use	700 cons. use	1,500 Div.			
AT&SF	273 cons. use	273 cons. use	1,260 Div.			
Desert View Mines	10 cons. use	0 cons. use				[2]
Pat Mines	80 cons. use	0 cons. use				[2]
Total	2,363 cons. use	973 cons. use				
		QUANTITIES IN IRRIGATED ACRES				
Wavers	148	130	130 to 148			
Stephenson	100	0	40 to 60			
Bleiman	40	0			40[3]	
Mendivil	20	0	20			
Grannis	30	0		30		
Morgan	25	0	25			
Milpitas (Sec. 14)	18	0		18		
Simons	10	3	10			
Fewell	18	0		18		
Colo. R. Sport.	16	0	16			
Milpitas (Sec. 1)	11	0		11		
Andrade	11	0	11			
Reynolds	6	5	6			
Bosworth	7	0			7[3]	
Cooper	10	0		10		
Total	470	138	258 to 296	87	47	

[1]Tentative support subject to effect of additional evidence and further study.
[2]Apparent loss of appropriate right. Attorney General's Office is making a reevaluation of evidence.
[3]Apparently not a mainstream source, but declaration would be a Department of Interior responsibility.
[4]Claim also will include 273 acre-feet per year of consumptive use.

California had claimed 5,031 acre-feet for 364 acres whereas Reclamation's Regional Director's Office appeared favorable to 4,350 acre-feet for 265 acres.

At Arizona's request, Interior's representatives met on June 2, 1972, with those of Arizona and its miscellaneous PPR claimants to review their claims.

By letter of June 16, 1972, the Colorado River Board of California advised Reclamation of the status of efforts to clarify six of the miscellaneous claims. A similar report was made October 20, 1972.

In a meeting on August 8, 1972, between Reclamation and California, agreement was reached on twelve of the eighteen miscellaneous claims (see memorandum of August 15, 1972, to Regional Supervisor, Water and Land Operations). The six claims not then agreed to were the subject of the aforenoted California's letter of June 16, 1972.

On January 2, 1973, California furnished Reclamation with an additional list of 36 parcels of land, each claiming a PPR for 1 acre-foot of diversions for M&I use.

K. Draft Stipulation on PPRs

On January 5, 1973, Reclamation provided Arizona and California with a draft of proposed letter from Interior to Justice which would transmit a proposed stipulation of decree to Justice, and a draft of letter to the

attorneys and chairman of each of the five Indian Tribes on the Colorado River which would advise the Tribes of the proposed stipulation.

The proposed letter to Justice would state that the stipulation has been agreed to by all the parties in *Arizona* v. *California* and noted the different hydrological positions for the major irrigation claimants as related to return flows to the Colorado River which justified the use of a single diversion figure for the non-Indian irrigation claimants. Only the lesser M&I uses were stated with a dual limitation. The enclosed table shows the claims filed with the Supreme Court in 1967 totalling approximately 3,460,000 acre-feet and those proposed for a stipulated settlement, totalling approximately 3,159,000 acre-feet.

MAJOR PRESENT PERFECTED RIGHTS CLAIMS

	Claimed in filings with the Supreme Court (acre-feet)			Now proposed for a stipulated settlement[2]	
	U.S.	California	Arizona	Acre-feet	Priority Date
Imperial Irrigation District		2,806,000 [1]		2,600,000[2]	1901
Palo Verde Irrig. Dist.		208,100 [1]		219,780[2]	1877
Reservation Division (Bard Dist.)	39,561	42,325 [2]		38,270[2]	7-8-05
Valley Division, Yuma Project	299,852		279,378[1]	254,200[2]	1901
North Gila Valley Unit Yuma Mesa Div., Gila Proj.	31,994		31,840[1]	24,500[2]	7-8-05
Yuma Auxiliary Project (Unit B)	6,801		7,350[1]	6,800[2]	7-8-05
SUBTOTALS		3,056,425 [1]	318,568[1]	3,143,550[2]	
Arizona - Cibola Valley			27,706[1]		
- Misc. Claims			45,084[1] and [3]		
- Supp'l Claims			8,000[1] and [4]		
SUBTOTAL			80,790[1]	10,751[2]	
California - Misc.		4,145.7[1]		5,001[2]	
TOTALS		3,060,570.7	399,358[1]	3,159,302[2]	

[1]Consumptive Use.
[2]Diversions.
[3]Does not include four subsequent claims involving a consumptive use of approximately 4,000 acre-feet per annum.
[4]Does not include two subsequent claims involving a diversion of approximately 1,100 acre-feet per annum.

On January 8, 1973, Interior's Office of Indian Water Rights advised the Chairman of each of the Indian Tribal Councils of the proposed submittal of the draft stipulation by Interior to Justice. A followup letter of January 12, 1973, transmitted a revised draft of stipulation to the same parties, but, at the suggestion of California, pointed out "the most significant change as the addition of data listing the PPRs for the five Indian Reservations named in Article II(D) of the Decree by identifying the number of irrigable acres within each State."

Indicative of Interior's assumption that "...the Indian water rights on the lower Colorado River continue to be fully protected by Article II of the decree..." is the letter of February 26, 1973, from Acting Secretary of the Interior Whitaker to the Chemehuevi Tribe Council and attorneys.

Nevertheless, in a letter of March 16, 1973, to Interior, the Confederation of Indian Tribes of the Colorado River made a strong protest and alleged that "the correct figures regarding their entitlement had not been supplied to the Supreme Court in 1954...." The Confederaton asked that no proposal be transmitted to Justice until after the correct figures are obtained; i.e., an enlargement of the Decree total entitlement of 905,496 acre-feet of water for 136,636 acres of land. Interior provided funds for the requested study (see the Deputy Solicitor's letter of March 21, 1973, and the Phoenix Area Office, BIA, letter of April 6, 1973, to the Confederation, which listed the acreages requiring study).

L. Interior's Submittal of Draft Stipulation to Justice

On April 12, 1973, Acting Secretary of the Interior Whitaker transmitted to Solicitor General Griswold, Department of Justice, the draft of proposed stipulation stating it "has been informally prepared with participation by all the parties in *Arizona* v. *California*" (see Appendix 1004 for its text). Interior's letter discussed the use of the dual limitation for Federal establishments, the various districts' hydrological positions, the fact that the major PPR claims for irrigation in the proposed stipulation are stated in terms of a single diversion figure and not the dual limitation, the fact that the PPR claims for M&I uses are stated in terms of a dual limitation, and a tabulation comparing the rights claimed by the parties in 1967 and in the proposed stipulation. A copy of the tabulation follows:

MAJOR PRESENT PERFECTED RIGHTS CLAIMS

	Claimed in filings with the Supreme Court (acre-feet)			Now proposed for a stipulated settlement[2]	
	U.S.	California	Arizona	Acre-feet	Priority Date
Imperial Irrigation District		2,806,000[1]		2,600,000[2]	1901
Palo Verde Irrig. Dist.		208,100[1]		219,780[2]	1877
Reservation Division (Bard Dist.)	39,561[2]	42,325[2]		38,270[2]	7-8-05
Valley Division, Yuma Project	299,852[2]		279,378[1]	254,200[2]	1901
North Gila Valley Unit Yuma Mesa Div., Gila Proj.	31,994[2]		31,840[1]	24,500[2]	7-8-05
Yuma Auxiliary Project (Unit B)	6,801[2]		7,350[1]	6,800[2]	7-8-05
Indian Res. - Arizona[5]	761,562[2]			761,562[2]	various

MAJOR PRESENT PERFECTED RIGHTS CLAIMS

	Claimed in filings with the Supreme Court (acre-feet)			Now proposed for a stipulated settlement[2]	
	U.S.	California	Arizona	Acre-feet	Priority Date
Cibola Valley Claims - Arizona			27,706[1]	0	
Misc. Claims - Arizona			45,084[1 3]	10,781[2]	various
Supp'l Claims - Arizona			8,000[1]	0	
Indian Res. - Calif.[5]	131,400[2]			131,400[2]	various
Misc. Claims - Calif.		4,145.7[1 4]		5,001[2]	various
Indian Res. - Nevada[5]	12,534[2]			12,534[2]	Sept. 18, 1890
Lake Mead NRA - Nevada[5]	500[2]			500[2]	May 3, 1929

[1]Consumptive Use.
[2]Diversion.
[3]Does not include four subsequent claims involving a diversion of approximately 3,000 acre-feet per annum.
[4]Does not include 38 subsequent claims involving a diversion of approximately 276 acre-feet per annum.
[5]Federal establishments named in Article II, subdivision (D), paragraphs (1) through (6) of the decree of March 9, 1964.

L.1. Justice's Revision of Interior's Draft Stipulation

On September 17, 1973, Justice suggested a modification of the Interior draft stipulation of April 12, 1973, which would modify and conform the statement of the Federal present perfected rights; i.e., primarily the Indian Reservations, to the single diversion figure provided for the non-Federal major irrigation districts and would add a reasonable use requirement applicable to all PPRs. The proposed action was consistent with Interior's prior position set out in the aforementioned Solicitor's letter to Justice dated January 20, 1967, but had not been cleared by either Interior or Justice with the Indian Tribes whose PPRs were involved. The Justice revision also provided a new paragraph which explained that the Decree reference to a "defined area of land" can best be complied with by reference to the boundaries of an irrigation district.

L.2. California's Modification of Justice's Revisions

At a meeting in Denver on November 19, 1973, between Justice and the parties to *Arizona* v. *California*, Justice insisted that the non-Indian PPRs and the Indian PPRs be stated in a similar format. On December 19, 1973, the Lower Basin States reiterated their views that the Indian rights would be protected if cross-referenced in the stipulation without specifically enumerating them in the stipulation since the Indian rights are already spelled out in Article II(D) of the Decree. The States provided a revised draft of stipulation. This version referred the Indian PPRs to Article II(D) of the Decree, omitted Justice's explanation regarding "defined area of land," and modified Justice's addition of reasonable use requirements.

On January 22, 1974, the Field Solicitor at Riverside, California (the successor to the Regional Solicitor's Office, Los Angeles), provided the Solicitor with an analysis of the California draft stipulation of December 19, 1973. He noted the need for further discussions with the Indian Tribes whose PPRs were involved and the indications of resistance by the States to an enlargement of the Indians decreed PPRs for water, which the Tribes were then in the process of documenting, since any increase in Indian PPRs will reduce the water supply for non-Indian contractors who lack a PPR.

A memorandum of January 31, 1974, from the Assistant Secretary, Program Development and Budget, to the Under Secretary, noting the Indian Tribes claims of insufficient rights and suggesting a delay in the matter of PPRs, did little towards clarifying the situation. As analyzed by the Field Solicitor's memorandum of February 22, 1973, to the Associate Solicitor, Energy and Resources, and as viewed by Justice, it contained sufficient errors to prompt Justice to advise the Solicitor that there was a "considerable misunderstanding" of the role of Justice and that a meeting by Justice with the Indians would be premature until the matter is fully understood by officials of Interior.

California receded partially from its prior position as to the statement of PPR claims. On March 12, 1974, in an effort to meet Justice's objections, it advised Justice that the rights of the Indians need not be included in the list of the PPRs prepared pursuant to Article VI of the Decree since they are already covered in Article II(D) but more importantly, the States inserted acreage figures, or the number of irrigable acres, in each of the major PPR claims. Justice requested Interior's views on that proposal.

In response to the Associate Solicitor's request for an opinion thereon, the Field Solicitor, Riverside, noted on April 12, 1974, that the inclusion of references to the specific number of acres within each of the projects was an improvement over prior drafts; that while it does not provide Interior with the same measure of control over water use as does the dual limitation now incorporated in Article II(D) of the Decree for Indian Reservations, it does provide a partial limitation on the use of diverted water, but that the California proposal did not meet Justice's attempt to equate Indian PPRs with the non-Indian PPRs.

L.3. Delay in Consideration of Draft Stipulation

On June 28, 1974, the Solicitor advised Justice that in view of the Indian concern over their PPRs and the need for further investigation, a 7-month delay was requested by Interior for responding to the States latest proposal. Justice so advised the States on July 16, 1974.

On August 27, 1974, the States wrote the Secretary and criticized the Solicitor for receding from the Department's prior approval of the stipulation. They enclosed a chronology of highlights of the PPR activities, and requested a meeting with the Secretary. The Secretary replied on October 2, 1974, that, due to the strong representations from the Indian Tribes, studies were needed as to the reliability of some of the figures used for the non-Indian PPR claims. This led to a meeting on March 18, 1975, betweeen the States and the Solicitor, a date selected to allow the Indian Tribes the necessary time for examination of a study made by Earth Environmental Consultants, Inc., as to the irrigability of lands not considered irrigable in the United States presentation of the Indian rights in *Arizona* v. *California*.

In a letter to the Secretary dated March 12, 1975, the Lower Basin States, speaking through the California Attorney General, reviewed the nature of the PPR problem and the negotiations to resolve it. They reiterated that the PPRs of the Indian Reservations are specifically excluded by the provisions of Article VI from the list of the PPRs to be filed by the States and that the Indian PPRs are not only quantified by Article II(D) but are subject to modification, apart from Article VI, through the provisions of Article IX.

Article IX provides:

> "Any of the parties may apply at the foot of this Decree for its amendment or for further relief. The Court retains jurisdiction of this suit for the purpose of any order, direction, or modification of the Decree, or any supplementary decree, that may at any time be deemed proper in relation to the subject matter in controversy."

It was the States position that the proposed stipulation poses neither a practical nor a legal threat to the Indian Reservations interests and that, given the non-Indian PPRs and priority dates and the hydrologic experience, the Upper Basin Compact obligation to deliver 75 maf every 10 years, and the quantity of water in storage, there is "...virtually no chance that any of the five Indian Reservations would ever be denied their full annual allotment of water specified in the Decree...."

L.4. Indian Objections to Draft Stipulation

A March 18, 1975, meeting was attended by representatives of all the parties in *Arizona v. California* and by the Indian Tribes. The Tribes challenged the accuracy of some of the non-Indian PPR claims, such as

the Palo Verde Irrigation District priority date of 1877, and asserted that the doctrine of "relation back" which, for example, led to the stipulated priority date of 1901 for Imperial Irrigation District's PPR, was inapplicable to the Tribes PPRs. They also rejected the States argument that there was ample water available in the river and in storage to satisfy all PPRs and claimed there was insufficient water in the mainstream for the Central Arizona Project, an assertion denied by the States engineers. They stated that if there was ample water, why not give the Indian PPRs priority over the non-Indian PPRs, but indicated that such a priority should extend not only to the Indian PPRs set out in Article II(D) of the Decree, but to additional acreages found to be irrigable either by land reclassification or by enlargement of the Reservation's boundaries.

The States were unwilling to agree to a priority which, according to them, was open-ended and so advised the Solicitor on April 7, 1975. At that time they charged that the Tribes were holding up the draft stipulation in order to gain additional water under *Arizona* v. *California*, and urged that a decision on the stipulation should not be further delayed.

The Tribes launched a four-prong attack on the non-Indian PPR claims in the proposed Stipulation.

(1) The Associate Solicitor, Division of Indian Affairs, Reid P. Chambers, prepared memoranda to the Solicitor dated January 14, 1975, asserting that the doctrine of "relation back," whereby the water rights claimed by the several irrigation districts related back under State law either to the date of the initial filing of notices of appropriations or to the date of the commencement of construction of diversion facilities, was not applicable as against the United States. He also urged an immemorial priority for the five Colorado River Indian Reservations and stated that the enlargement of the boundaries of the Reservations by the Secretary and the additional acreages in these Reservations by the Secretary and the additional acreages in these Reservations should increase the irrigable areas for which PPRs should attach as well as for the acreage not considered "irrigable" in *Arizona* v. *California* but under reexamination in the then incomplete Earth Environmental Consultants, Inc., report.

In an opinion of May 15, 1976, Mr. Milton N. Nathanson, the former Interior Field Solicitor, Riverside, Special Consultant to Reclamation, provided Reclamation with an analysis of the foregoing memoranda which rejected their findings as irrelevant to the issue at hand and not in accordance with the Decree provisions. Likewise, Interior's Field Solicitor Thomas A. Hine's memorandum of May 26, 1976, to the Solicitor, agreed with Mr. Nathanson.

(2) On July 25, 1975, pursuant to a contract with the Bureau of Indian Affairs, W.S. Gookin & Associates attacked each of the major PPR claims in California and Arizona. For example, Gookin challenged the Palo Verde Irrigation District PPR priority date of 1877 and questioned whether the delivery of water to Imperial Irrigation District satisfied the Decree requirement of a defined area of land. These comments were reviewed by Mr. Nathanson, and, in turn, were rejected by him as based on questionable legal and factual assumptions. Reclamation also adopted Mr. Nathanson's comments and transmitted them to the Solicitor with its memorandum of December 2, 1975.

(3) The Earth Environmental Consultants, Inc., study was completed in March 1975 and concluded that there were approximately 50,000 acres of land on the five Colorado River Indian Reservations, in addition to the 136,636 acres for which the Decree established PPRs, which, based on soil classifications, were irrigable, but assumed water could be delivered to these areas regardless of economics or practicability. The United States had made no PPR claims for this acreage in presenting its evidence in *Arizona* v. *California* on the premise that it was impracticable to irrigate it. The Earth Environmental Consultants results were challenged by the States in a memorandum dated August 25, 1975, which requested that Interior make its own irrigability study, but this was not done although the Solicitor requested such a study (see Solicitor's memorandum to Under Secretary of June 7, 1976). Reclamation's preliminary evaluation likewise considered the Earth Environmental Consultants study inadequate to determine the economic suitability of the lands for irrigation (see memorandum of October 24, 1975, from the Regional Director to the Commissioner, and Reclamation's memorandum to Solicitor dated December 2, 1975).

(4) On August 13, 1975, Mr. William Veeder presented a detailed critique on alleged shortcomings in the PPR stipulation advocated by Reclamation and the States.

L.5. Nathanson's Analysis of Foregoing

At Reclamation's request, Mr. Nathanson reviewed the Veeder report and on October 20, 1975, presented a documented refutation of its charges. After their review of Mr. Nathanson's conclusions the Lower Basin States concurred with his responses in a letter of November 18, 1975. In the States view, the Veeder report expressed nothing new or relevant, hence the States again urged Interior's approval of the proposed stipulation. By memorandum of December 2, 1975, to the Solicitor, Reclamation also concurred in the findings of Mr. Nathanson that the issues raised in both the documents submitted by Messrs. Gookin and Veeder, as they relate to non-Indian PPRs, had been previously argued and resolved before the Supreme Court during the trial of *Arizona* v. *California*, or during the negotiations with the States which culminated in the subject stipulation. Reclamation recommended that the stipulation be filed with the Supreme Court and that it be acted upon independently of Indian efforts to expand their water rights over the amounts established by the Supreme Court Decree in 1964.

L.6. Solicitor's Review of Background of Stipulation

A "Summary Statement for Solicitor Austin" designated "W.O. Draft, Revised M.N.N. 5-7-76" describes the background of the latest draft of stipulaton and summarizes both the Indian arguments and those of Reclamation and the States regarding the stipulation.

Interior's Solicitor Austin invited the States representatives to discuss the matter on June 15, 1976. The States then indicated a willingness to subordinate their PPR claims to those of the five Indian Reservations as stated in Article II(D) of the Decree. Interior said Justice wanted the Indian PPRs stated in terms of a single diversion figure similar to the format proposed for the non-Indian PPRs, but the States disagreed. Interior also proposed a restatement of the original Justice proposal that explained the use of an irrigation district's boundaries as satisfying the term "defined area of land" in Article I(G) of the Decree.

M. States Revised Proposed Stipulation

On July 2, 1976, the States submitted a revised draft of stipulation which incorporated the Interior proposals of June 15, 1976. It included the subordination of the non-Indian PPRs to those of the Indians as set forth in the Decree plus a maximum quantity for rights resulting from boundary changes, up to an additional 4,255 acres, as ordered by the Secretary, between the date of the Decree and the date of the stipulation, and "as are hereafter established by decree or future stipulation"; i.e., the States were not accepting the validity of the boundary enlargement but only the formula for determining the rights to water if the enlarged boundaries were found to be correct and the land found to be "practicable of irrigation." The States also proposed that the subordination not apply to the miscellaneous claims because of the difficulty in reaching all of the miscellaneous claimants and obtaining their agreement, and the limited quantities of such rights; e.g., 4,200 acre-feet in California and 10,000 acre-feet in Arizona. And finally, the States acceded to Interior's view that the non-Indian rights be stated in terms of a dual limitation identical in format to the Indian PPRs in Article II(D) of the Decree.

In response to the Solicitor's request of August 4, 1976, to Reclamation and the BIA, for comments, Counsel for the Confederated Tribes of the Lower Colorado River, on August 1976, proposed major changes in the stipulation which would include the Tribes as parties to the stipulation, a status not previously accorded them; and reopening other questions, some of which the Solicitor and Justice had previously resolved, such as objecting to a district-wide PPR claim as satisfying the Decree definition of a "defined area of land." The Confederation also objected to the lack of a priority for Indian PPRs over miscellaneous PPR claims, and to the failure of the States to agree in advance to a priority for Indian rights in the enlarged boundaries of Reservations.

The United States then demanded the further condition that the States agree to additional quantified Indian water rights based on the boundary enlargements whether or not the Secretarial orders proved to be

legal. The States rejected this (see States memorandum in support of proposed Supplemental Decree, page 24, May 2, 1977).

A meeting on December 16, 1976, between the States and Interior's Solicitor Austin was inconclusive. The States urged resolution of the miscellaneous claims as stopping a hardship on the claimants who are "trespassers" without an agreement and because only 17,500 acre-feet of water was involved, 12,500 acre-feet in Arizona and 5,000 acre-feet in California. On January 19, 1977, Solicitor Austin rejected the States Proposed Stipulation as well as any agreement on the miscellaneous claimants.

The efforts to negotiate and stipulate to a Decree regarding Present Perfected Rights had failed.

N. Upper Colorado River Commission's Observation

It is interesting to note that in 1964 the Upper Colorado River Commission made the following observation:

> "It is possible that this case (*Arizona* v. *California*) has not been terminated because of the inability of the parties to agree as to what are present perfected rights in terms of consumptive use as required by this Decree, and that there will be need for a final determination by the Court to ultimately settle this particular issue." (See page 35, Sixteenth Annual Report of the Upper Colorado River Commission, September 30, 1964.)

O. Back to the Supreme Court

Because of the inability to reach an agreement, on May 3, 1977, Arizona, Nevada and the California Defendants, moved the Supreme Court, pursuant to Article VI of the Decree, for a determination of present perfected rights as set forth in the submitted proposed supplemental decree and for the entry of that decree. Their grounds were that: (1) Article VI of the Decree provides for a determination of these rights if the parties and the Secretary are unable to agree thereon and the parties have been unable to secure the Secretary's approval; and (2) the Secretary has no valid basis for his refusal.

The proposed Decree was set out in the Motion. It included provisions that the determination shall in no way affect future adjustments resulting from determinations relating to settlement of Indian Reservation boundaries referred to in Article II(D)(5) of said Decree; that Article IX of said Decree is not affected by this list of PPRs; that any water right listed herein may only be exercised for beneficial and reasonable uses; and that in the event of insufficient mainstream water to satisfy PPRs pursuant to Article II(B)(3) of the Decree, the Secretary shall, before satisfying any other PPRs except the miscellaneous, first satisfy the rights of the five Indian Reservations as set forth in Article II(D)(5), plus such additional PPRs as may be hereafter established by decree or future stipulation that are based on orders of the Secretary enlarging the boundaries of the Reservations that have been issued between the date of the Decree and May 2, 1977 (the date of the subject Motion).

The States asserted in an accompanying memorandum that the Indians were not prejudiced by the proposed decree but that their water rights are actually strengthened because of the subordination of the non-Indian claims to the Indian PPRs (except for the miscellaneous claims which are minor).

The response of the United States, dated November 1977, and filed November 10, 1977, agreed that a motion for determination of PPRs is appropriate under Article VI of the Decree and stated that the United States does not oppose the entry of the proposed supplementary decree if the following several modifications were made:

(1) That any water right may only be exercised for beneficial uses; i.e., delete "and reasonable."

(2) That the determination of the boundaries of the Reservations not be limited to those made by Secretarial orders between the date of the Decree and May 2, 1977. The reasons therefor were that certain boundary changes for the Cocopah and Colorado River Indian Reservations were made by Court orders, and that no time limit for boundary changes had been contemplated in prior discussions. (The time limit would have affected a later Secretarial Order changing the boundaries of the Fort Yuma Reservation.)

The United States did, however, oppose the entry of the proposed decree if its suggested modifications were not made, and recommended the appointment of a Special Master. In that case proof would be required to support the non-Indian claims.

On February 27, 1978, the States and the California Defendants filed their reply to the response of the United States to the initial joint motion. This stated that the differences between these parties had now been resolved by negotiation. The States accepted the modification proposed by Justice deleting the reference to "and reasonable" regarding the use of water, and reached agreement on alternative language in the subordination provisions which accorded with the proposal of the United States but added "practicably" to "irrigable acres." The reply further stated that in view of the agreement these parties intend to file a joint motion for entry of the agreed upon Decree.

P. Indian Tribes Intervention Motions and Opposing Responses

The above agreement had not gone unchallenged. On December 23, 1977, a Motion for Leave to Intervene as indispensable parties was filed by the Fort Mohave, Chemehuevi, and Quechan Tribes of the Fort Yuma Indian Reservations, joined in by the National Congress of American Indians as *Amicus Curiae*. The Motion for Leave to Intervene alleged that the Tribes were the owners of the full equitable title in and to the PPRs set out in the Decree and are, therefore, the real parties in interest in regard to these rights; that these rights have to be resolved and until resolved irreparable harm to them results; that the subordination of non-Indian claims is not effective; that there are patent ambiguities in the proposed supplemental decree; that the response of the United States fails to correctly advise the Court of the status of the boundary claims; that the United States failed to present in *Arizona* v. *California* all the irrigable acreage of the Tribes which were entitled to a PPR (it omitted claims for 51,253.26 irrigable acres); and that the Tribes deny the major PPR claims of the non-Indians. The Tribes requested permission to file a Petition for Intervention within 60 days.

On January 25, 1978, Arizona, the California Defendants, and Nevada filed a Reponse to the Motion of the three Tribes for Leave to Intervene. The grounds for the opposition were that intervention would constitute a suit against the three States without their necessary consent, and that the Tribes do not qualify for intervention as a matter of right or for permissive intervention. The States response further alleged that the Tribes have no remaining interest in the proceedings under Article VI of the Decree since the subordination provisions protect their Article VI rights, and that the Indian's additional claims come under Articles II(D) or IX; that *Res Judicata* bars any recalculation of irrigable acreage within the 1964 Reservation boundary changes. The State parties further alleged that Secretarial orders regarding Indian boundaries are functional for Interior's administrative purposes but not as the bases for asserting water rights which impinge on those of the State parties who are entitled to a court determination of the validity of Reservation boundary changes recognized by Secretarial orders.

The Motion of the three Tribes for Leave to Intervene was also opposed by a Memorandum for the United States in Opposition, dated February 1978. The Memorandum for the United States states the following grounds of the Tribes for intervention and answers each claim:

(1) The Tribes are the real parties in interest—while the Tribes are the beneficial owners of the water rights, this interest does not establish that they are indispensable parties.

(2) The representation of the Tribes interests by the United States is and has been inadequate due to pervasive conflicts of interest—which was denied.

(3) The proposed supplemental decree is patently ambiguous and does not ensure the priority of the Indian PPRs—which Justice denied since the subordination agreement gives priority to all Indian claims where there is a shortage of mainstream water and, where there is no shortage of water, the Tribes PPRs will be satisfied out of the 7.5 million acre-feet of water available.

(4) The United States Response does not set forth the status of certain boundary disputes—Justice agreed with the State parties' views that these need resolution but will do so in a proceeding under Article II(D) and Article IX, and not attempt to do so in this proceeding which comes under Article VI.

(5) That no claims were made for irrigable lands "omitted" from the 1964 Decree—as to which Justice stated there is not sufficient hydrological and technical data to adjudicate these claims, but a later claim is in no way foreclosed.

(6) The non-Indian PPR claims have no basis in fact—Justice disagreed, but stated it accepted them only conditionally as part of a stipulation including a subordination of these claims to the Tribes PPRs.

Hence, the United States considered intervention by the Tribes to be unwarranted; that the Tribes interests are fully represented by the United States; and that the Tribes be permitted to submit their views as *amici curiae*.

On April 7, 1978, a Petition of Intervention was filed on behalf of the three Tribes and for the Colorado River Indian Tribe and the Confederation of Indian Tribes. (The Colorado River Indian Tribe later removed itself from this Petition.) The Petition incorporated the prior Motion and Brief. It alleged among other things:

A. The Tribes are owners of full equitable title to PPRs.

B. The Tribes are the real parties in interest.

C. The United States is Trustee for the Tribes and is obligated to represent the Tribes before the Court.

D. The Secretary is unable to fulfill the obligations of trustee, to the irreparable damage to the Tribes, because of conflicting responsibilities.

E. The Solicitor General is subject to conflicting interests and represents Interior and adverse claims of non-Indian projects.

F-G. The 13-year delay in resolving PPRs is due to conflicts of interest of the Secretary.

H-I-J. The negotiations were unsuccessful because of disputes among the parties, were conducted without participation of the Tribes, and resulted in the present action.

K-R. The Tribes are prepared to contravene each of the non-Indian PPR claims, if afforded an opportunity to do so.

S. The United States has not denied the "spurious claims" but is in accord with them.

T-U. The Tribes will prove, if permitted, that non-Indian PPR claims are unconscionably inflated, that the Lower Colorado River is overappropriated and the present municipal use of waters owned by the Tribes makes their recovery difficult, and that the Secretary is building the Central Arizona Project, in total disregard of the Tribes rights.

The three Tribes further allege that, although representing the Indians, the United States has willfully failed to maintain communications with the Tribes as to the PPR negotiations; that Interior has limited the exercise of Indian PPRs for the benefit of non-Indian projects and uses; that non-Indians on the Federal reclamation projects received 160 acres while Indians on the Fort Yuma and Colorado River Indian Reservations received 5 acres; and attached an affidavit of a Bureau of Indian Affairs employee attesting to the foregoing.

The three tribes further allege that the United States refusal to establish boundaries on the Reservations is an example of Interior's policy to prevent the exercise of the Indians' PPRs; that no claims were asserted for Indian lands within the enlarged boundaries of the Reservations or for irrigable lands within the 1964 Reservation boundaries which were arbitrarily and capriciously abandoned; that the Tribes have been discriminated against by the refusal to provide funds to protect their interests in *Arizona* v. *California*; that patent ambiguities in the "Proposed Supplemental Decree," if adopted, will accentuate and not ameliorate ongoing conflicts; that intervention by the Tribes will expedite and not impede the ultimate conclusion of *Arizona* v. *California*; and that the alleged subordination is a "fraud and a subterfuge."

Wherefore, the Tribes petition that the Court will:

(1) Allow the Tribes to intervene and have their own counsel;

(2) Not grant the Joint Motion for a determination of PPRs; and

(3) Require all parties to meet to resolve conflicts—or if agreement cannot be reached, to file separate statements.

An Exhibit C to the Petition listed a total of 91,400 irrigable acres and 605,300 acre-feet of water therefor contained within Reservation boundaries and not presented to the Court in *Arizona* v. *California*.

A brief in support of the Tribes Petition of Intervention, dated April 7, 1978, alleged that the Solicitor General violated the "Code of Professional Responsibility" in *Arizona* v. *California* in that he represents the Secretary of the Interior whose interests are widely disparate from the interests of the Tribes.

The brief claimed that the Tribes PPRs are invaluable interests in real property and that Justice's approval of the non-Indian PPRs, but not those of the Tribes, is a breach of trust, as is the failure of the United States to consult or confer with the Tribes and the inadequate representation of the Tribes by the United States in *Arizona* v. *California*. Finally, the brief reiterated the Tribes need for independent counsel.

The States of Arizona, California, and Nevada and the other California Defendants filed a Response, dated May 22, 1978, to the Petition of Intervention and brief of the Tribes filed April 7, 1978, in which they opposed the Tribes Petition of Intervention and urged that the proceedings to carry out the Court's mandate under Article VI of the Decree be continued. Their prior arguments were repeated, including the statement that Article VI is not the proper vehicle for asserting additional Indian water rights but that Articles II(D)(5) and IX are available. It was noted that the Colorado River and Cocopah Indian Tribes had recognized this fact (see Part Q below), and had requested entry of the supplemental decree in the form approved by the States and the United States. (While the Colorado River Indian Tribe was named in the Tribes Petition as a party, it withdrew therefrom.)

Q. Intervention Sought by the Two Tribes

A new development occurred in April 1978. On April 10, 1978, the Colorado River and Cocopah Indian Tribes (the "two Tribes," which had not joined in the Motion for Leave to Intervene filed December 23, 1977, by the Fort Mohave, Chemehuevi and Fort Yuma Indian Reservations) filed a Motion for Leave to Intervene and a Petition for Intervention.

In a departure from the position of the three Tribes, the two Tribes stated that they approve and request the entry of a supplemental decree but in a modified form agreed to by the States in their Reply of February 27, 1978.

However, in arguments similar to those of the three Tribes, intervention was sought because of inadequate Government representation causing irreparable harm to the Tribes in their inability to develop their water rights. The two Tribes alleged a Governmental conflict of interest and the Government's failure to timely assert their claims of additional PPRs resulting from the resolution of boundary disputes which the Tribes recognize comes within Articles II(D) and IX and not Article VI of the 1964 Decree.

The Motion of the two Tribes stated that as a result of judgment in *Cocopah Indian Tribe* v. *Morton*, on May 12, 1978, an additional 883.53 acres were part of the Reservation, of which 780 are practicably irrigable and have a right to 4,969 acre-feet of diversions of mainstream water.

The Motion further stated that by Secretarial Order of January 17, 1969, an additional 4,439 acres were within the Colorado River Indian Reservation, of which 2,710 were practicably irrigable and have a right to divert 18,076 acre-feet of water.

Further, the United States failed to assert claims in *Arizona* v. *California* to approximately 37,449 practicably irrigable acres within the Colorado River Indian Reservation and for acreage within the Cocopah Indian Reservation now being computed.

Finally, the Motion argued that while the subjects of their Motion may not be within Article VI they should be entertained by the Court to avoid piecemeal proceedings.

In their Petition for Intervention the two Tribes moved for the entry of a supplemental decree confirming their rights to the quantities of water set out above for the indicated above acreages and prayed that the Court decree to them additional PPRs pursuant to Articles II(D)(5) and IX of the original Decree of March 9, 1964.

The reliance on these Articles was consistent with the States arguments but not those of the three Tribes.

R. Responses in Opposition

Three responses were filed to the April 10, 1978, Motion of the Colorado River and Cocopah Indian Tribes for Leave to Intervene.

On June 1, 1978, California, Nevada, the Coachella Valley County Water District, and the Imperial Irrigation District argued that the intervention would authorize a suit by the Tribes against the States (since claims for additional PPRs would be contrary to the interests of the States) and therefore requires their consent which is lacking. The response reviewed the contrasting position of the three Tribes and that of the current Petitioners; i.e., the two Tribes, and contended that claims for "omitted" lands are barred by *res judicata*. It also contended that intervention, if allowed, must be permissive and not as a matter of right, and that the United States representation of the Tribes has not been inadequate.

The parties would leave the question of intervention by the two Tribes up to the United States and, if supported by them, would not be opposed by the parties, but only on condition that (1) the proposed supplemental decree be entered forthwith, or (2) if intervention is granted it should be for the limited purpose of asserting additional Indian claims under Articles II(D)(5) and IX of the 1964 Decree and not to attack other previously quantified claims, or other parts of the Decree, and (3) that the Tribes should no longer be represented by the United States.

On June 5, 1978, Arizona's response was filed. It adopted the response of California, Nevada, the Coachella Valley County Water District, and Imperial Irrigation District, except that Arizona would not consent to intervention, which must be permissive and not as a matter of right, and also urged that the United States representation of the Tribes has been "adequate and zealous." Once land title disputes have been finalized in lower court decisions, asserted Arizona, the Supreme Court can make appropriate orders as to water rights.

On June 1, 1978, a Response to the Motion of the two Tribes for Leave to Intervene and Petition of Intervention was filed on behalf of The Metropolitan Water District (MWD), the City of Los Angeles, and the County of San Diego; i.e., the "Urban Agencies." They also adopted the response of California, Nevada, Coachella Valley County Water District and Imperial Irrigation District, and, in addition, challenged the Indian claims of additional water rights based on either "omitted" acreage or boundary changes.

The Urban Agencies alleged that if the Indian claims for increased acreage in California are upheld it would result in the consumptive use of an additional 237,860 acre-feet over the quantities in the 1964 Decree which would reduce MWD's allocation of Colorado River water by 20 percent. They opposed redetermination of the ("omitted") irrigable acreage within the undisputed Reservation boundaries as barred by *res judicata*, but believed it timely that the Court determine the Reservation boundary issues and requested the appointment of a Special Master for that purpose.

The Urban Agencies asserted that they were not parties to the court proceedings involving the Cocopah Reservation enlargement nor is the Secretarial Order of January 17, 1969, which increased the area within the Colorado River Indian Reservation, binding for the purpose of establishing a claim for a Federally reserved right which directly impinges on MWD's water rights.

The Urban Agencies repeated the condition expressed in the response of California, Nevada, Coachella Valley County Water District and Imperial Irrigation District, that they did not oppose permissive intervention if entry of the supplemental decree is not delayed pending the outcome of proceedings initiated under Articles II(D)(5) and/or IX of the Decree, and, if independent counsel is allowed for the Tribes intervention, that the United States not be allowed to concurrently represent the Tribes as trustee.

S. Joint Motion to Enter Agreed Upon Decree

On May 30, 1978, a Joint Motion for the Entry of a Supplemental Decree, dated May 26, 1978, was filed on behalf of the United States, the States, and the California Defendants. The Joint Motion noted that all these parties were in agreement on the proposed Decree which includes a provision giving priority to the Indians PPRs.

In a Memorandum for the United States dated May 1978, the United States reviewed the prior proceedings and continued to oppose the motion of the three Tribes to intervene in order to object to the entry of the proposed supplemental decree but stated that non-Article VI claims are in a different position. The United States was not prepared to proceed with claims for areas recognized as part of the Indian Reservations and that Interior had not determined whether it would recommend the assertion of claims for the "omitted" lands. However, if the Court concludes that the foregoing claims are sufficiently matured and definite to be entertained, the United States would not oppose intervention to present these claims after the current Article VI proceedings have been concluded by the entry of the proposed supplemental decree.

T. Supreme Court Opinion and Decree of January 9, 1979

On October 10, 1978, the Court heard oral arguments of the parties. On January 9, 1979, in a Per Curiam Opinion, the Court ordered that the Joint Motion of the United States, Arizona, the California De-

fendants, and Nevada, to enter a supplemental decree (filed May 30, 1978) is granted, and entered the Supplemental Decree which was the subject of Article VI of the 1964 Decree and of the negotiations and arguments since that time.

The Court appointed Judge Elbert P. Tuttle as Special Master with authority to fix the time and conditions for the filing of additional pleadings and to direct subsequent proceedings.

The Court denied the motion of the Fort Mohave Indian Tribe et al., for leave to intervene to oppose entry of the Supplemental Decree and referred this motion in all other respects and the motion of the Colorado River Indian Tribes et al., to the Special Master.

A copy of the Opinion and Supplemental Decree appears in Appendix 1005.

U. New Phase of Decreed Rights

Even before the Supreme Court had resolved the Article VI PPRs by its Opinion of January 9, 1979, the United States, on December 21, 1978, filed a Motion for Modification of the Decree (of March 9, 1964) and Supporting Memorandum. The motion sought to permit additional diversions of mainstream water for the five Reservations.

The reasons therefor were:

(1) The boundaries of the Reservations "...have been finally determined...."

(2) The boundary adjustments, effected since the Decree of March 9, 1964, have confirmed additionally practicably irrigable lands for which the United States reserved water rights, as follows:

Fort Mohave Reservation	3,000 acres in California
Chemehuevi Reservation	150 acres in California
Colorado River Reservation	3,110 acres in California
Fort Yuma Reservation	4,200 acres in California
	1,300 acres in Arizona
Cocopah Reservation	1,112 acres in Arizona

(3) There are within the boundaries of the Reservations practicably irrigable lands which, in approximate numbers, were erroneously omitted from consideration and are entitled to reserved water rights:

Fort Mohave Reservation	100 acres in California
	1,000 acres in Arizona
	150 acres in Nevada
Chemehuevi Reservation	500 acres in California
Colorado River Reservation	2,000 acres in California
Fort Yuma Reservation	500 acres in California
Cocopah Reservation	33 acres in Arizona

(4) The Reservations are entitled, with the priority dates recited in Article II of the March 9, 1964, Decree, to additional annual diversions for:

Fort Mohave Reservation	20,026 acre-feet in California
	6,460 acre-feet in Arizona
	969 acre-feet in Nevada
Chemehuevi Reservation	3,880 acre-feet in California
Colorado River Reservation	30,854 acre-feet in California
	89,940 acre-feet in Arizona
Fort Yuma Reservation	31,352 acre-feet in California
	8,668 acre-feet in Arizona
Cocopah Reservation	7,294 acre-feet in Arizona

The Motion alleged jurisdiction under Articles II(D)(5) and IX of the Decree.

The Memorandum in Support stated that the Motion did not seek to reexamine the prior allocations; that the Court need not redetermine the boundaries or review administrative action fixing them; that the Court decree additional water, at a rate per acre previously fixed, for the acres confirmed to each Reservation; that the only issue is whether the acreage is "practicably irrigable"; and that a similar process be used for the "omitted" lands.

Thus, the issues for this subsequent phase of Present Perfected Rights are taking shape.

CHAPTER XI

ENLARGEMENT OF BOUNDARIES OF INDIAN RESERVATIONS ALONG LOWER COLORADO RIVER AND ALLEGED "OMISSION" OF IRRIGABLE ACREAGE

A. Background

In *Arizona* v. *California*, 373 U.S. 546, the Special Master resolved the boundary disputes involving the Colorado River and Fort Mohave Indian Reservations (see Articles II(C)(2)(d) and (e) of Proposed Decree, pages 273-287 and 351-352, Special Master's Report, December 5, 1960). The Supreme Court, however, disagreed with the Master's decision to determine these disputed boundaries and left the resolution of the boundaries to a later date, 373 U.S. 546, 601.

Subsequently, as described herein, the Department of the Interior acted to resolve the boundary questions for these two Reservations. In addition, it has "enlarged" the boundaries of the Chemehuevi and Cocopah Indian Reservations and most recently, on December 10, 1978, a Secretarial Order returned lands to the Yuma Indian Reservation. This was based on a Solicitor's Opinion of December 20, 1978, which reversed the opinions of former Solicitors Austin, Weinberg, and Margold, each of which had expressed conclusions contrary to the December 20, 1978, Opinion.

B. Effect of Boundary Changes on Water Use and Rights

In *Arizona* v. *California*, 373 U.S. 546, the Supreme Court agreed with the Special Master's findings that "enough water was reserved to irrigate all the practicably irrigable acreage on the Reservations" (373 U.S. 546, 601). The Court found that the "various acreages of irrigable land which the Master found to be on the different Reservations (we find it to be) reasonable" (373 U.S. 546, 601).

The Departmental actions which "enlarged" the boundaries of the four Reservations raise questions as to the number of "practicably irrigable acres" in the "enlarged" areas, the quantity of water required therefor, and the priority dates to be accorded to those areas.

According to the Area Director, Bureau of Indian Affairs, letter of July 16, 1976, to the Commissioner of Indian Affairs, these irrigable acreages are:

Cocopah Indian Reservation	1,142
Chemehuevi Indian Reservation	166
Colorado River Indian Reservation	3,964
Fort Mohave Indian Reservation	228

These questions are awaiting resolution as a result of the Supreme Court Opinion of January 9, 1979, dealing with the determination of "present perfected rights" pursuant to Article VI of the Decree of March 9, 1964, in *Arizona* v. *California*, 376 U.S. 340. At this writing it appears that the answers to the above question will be determined by litigation before the newly appointed Special Master as to the validity of the Departmental actions (see Chapter I, K, and Chapter X herein).

C. Issues of "Omitted" Irrigable Lands in Litigation in Arizona v. California

The possible increase in present perfected rights for the five Reservations is a matter separate and apart from the assertion of the five Tribes that, during the course of the litigation in *Arizona* v. *California*, the Government omitted and did not advance claims for all the irrigable acreages within the Reservations as they were constituted prior to their "enlargement."

The Bureau of Indian Affairs, in behalf of the Confederation of Colorado River Indian Tribes, engaged Earth Environmental Consultants (EEC) to survey the five Indian Reservations in the Lower Basin adjacent to the Colorado River to evaluate the irrigability of the lands in each Reservation which were not classified as irrigable and which were not found irrigable by the Special Master in *Arizona* v. *California*, 376 U.S. 340. The EEC Reports dated March 1975, found the following additional acreages to be irrigable (these include acreages due to "enlargement" of boundaries):

West Cocopah Indian Reservation	1,142.26
Chemehuevi Indian Reservation	2,367.32
Colorado River Indian Reservation	35,766.34
Fort Mohave Indian Reservation	3,550.34
Fort Yuma Indian Reservation	9,807.72
	52,633.98

The EEC Reports stated that the lands were classified in accordance with the "Land Capability Standards" used by the Bureau of Indian Affairs. Soil physical and chemical properties and associated land characteristics were examined. The BIA standards, according to the Reports, "...assume that water is available for irrigation and can be delivered to the land site." Hence, the EEC Reports did not evaluate the economics of irrigating these acres or whether the foregoing acres were "*practicably* irrigable" as stated by the Special Master and confirmed by the Supreme Court in *Arizona* v. *California* (emphasis added). The Bureau of Reclamation also questioned the irrigability of the lands in question.

However, the Tribes Petition of Intervention dated April 7, 1978 (which did not include the Cocopah Tribe), included the following Exhibit C-1, listing a total of 91,400 irrigable acres within the four Reservation boundaries which were not presented to the Supreme Court in *Arizona* v. *California*. The Cocopah claim would increase this total.

C-1

"IRRIGABLE ACREAGE CONTAINED WITHIN RESERVATION BOUNDARIES NOT PRESENTED TO THE UNITED STATES SUPREME COURT BY THE UNITED STATES IN *ARIZONA* v. *CALIFORNIA*

RESERVATION	Acres	Acre-Feet Per Acre	Acre-Feet
FORT MOHAVE			
Hay and Wood Reserve			
West of 1931 Survey	3,500	6.46	22,600
Additional Lands	1,200	6.46	7,800
Camp Mohave Reserve	3,000	6.46	19,400
Intermediate Area	1,200	6.46	7,800
Checker Board Area	3,900	6.46	25,200
Subtotal	12,800		82,800
COLORADO RIVER INDIAN RESERVATION			
Benson Line Area	4,000	6.67	26,700
Ninth Avenue Cutoff	200	6.67	1,300
Olive Lake Cutoff	2,000	6.67	13,300
South of the Benson Line	2,500	6.67	16,700

C-1

IRRIGABLE ACREAGE CONTAINED WITHIN RESERVATION BOUNDARIES NOT PRESENTED TO THE UNITED STATES SUPREME COURT BY THE UNITED STATES IN *ARIZONA* v. *CALIFORNIA*

RESERVATION	Acres	Acre-Feet Per Acre	Acre-Feet
COLORADO RIVER INDIAN RESERVATION			
Along Northern Boundary	5,000	6.67	33,400
La Paz Area	3,000	6.67	20,000
South and East of River (Other)	41,600	6.67	227,500
Subtotal	58,300		388,900
CHEMEHUEVI INDIAN RESERVATION	2,500	5.97	14,900
Subtotal	2,500		14,900
QUECHAN TRIBE			
Additional Lands	13,000	6.67	86,700
Accretion Lands	4,800	6.67	32,000
Subtotal	17,800		118,700
Grand Total	91,400		605,300

FOOTNOTE: These figures are the most exact that are available to the petitioning Tribes at this time. The figures which have heretofore been presented to his Honorable Court are grossly inadequate due to the failure of the United States, as Trustee, to expeditiously resolve the boundary disputes and make the necessary soil surveys and land classifications. See section entitled, "Refusal to Establish Boundaries On the Indian Reservations, a Corollary to Interior's Policy to Preclude Exercise of Indian 'Present Perfected Rights.' " There is possible overlapping which should be resolted by an Order from this Court."

On the other hand, the Tribe's Motion for Leave to Intervene, dated December 23, 1978, contains the following tabulation for "omitted" lands:

Yuma	5,282.32 irrigable acres
Chemehuevi	2,367.32 irrigable acres
Cocopah	1,175.27 irrigable acres
Colorado River	38,769.16 irrigable acres
Fort Mohave	3,550.34 irrigable acres
Parker Townsite	108.85 irrigable acres
	51,253.26 irrigable acres

D. Summary of United States Claims

Finally, the Motion of the United States for Modification of the Decree, filed with the Court on December 21, 1978, claims the following "omitted" acreages of acres added by boundary adjustments, and acre-feet of water:

	Omitted	Boundary Adjustments	Acre-Feet of Water
Fort Mohave	1,250 acres	3,000 acres	27,455
Chemehuevi	500 acres	150 acres	3,880
Colorado River	15,000 acres	3,110 acres	120,794
Fort Yuma	500 acres	5,500 acres	40,020
Cocopah	33 acres	1,112 acres	7,294

It is presumed that these differences and the validity of the claims will be the subject of the proceedings before the Special Master appointed by the Supreme Court's Opinion of January 9, 1979, in *Arizona* v. *California*.

E. Chemehuevi Indian Reservation

E.1. Background

The Chemehuevi Indian Reservation was established by an order of withdrawal from entry made by the Secretary of the Interior dated February 2, 1907 (see Appendix 1101 for text of order). According to the Solicitor's Opinion of December 15, 1939, the Order was in confirmation of the Indian's use and occupancy rights therein acquired by long residence. Pursuant to that order, approximately 36,000 acres of land bordering on the California side of the Colorado River were withdrawn pending action of Congress to authorize the addition of the lands to the Chemehuevi Indian Reservation. The effect of the withdrawal was the addition of these lands to the Reservation.

On February 10, 1933, the United States, acting through the Secretary of the Interior, contracted with The Metropolitan Water District of Southern California (MWD), for the Parker Dam Project. Funds for the construction of Parker Dam in the amount of $13,170,437 were advanced by MWD to the United States for the construction of Parker Dam, which was to serve as a forebay and desilting basin from which MWD could pump water into its Colorado River Aqueduct for delivery to the coastal plain of Southern California. MWD and the United States each had the rights to one-half of the power privileges at the Dam. An Act of Congress, dated August 30, 1935, 49 Stat. 1038, authorized construction of the Dam, which was substantially completed in September 1938.

E.2. Act Granting Reservation Lands to United States

In aid of construction of Parker Dam, the Act of July 8, 1940, 54 Stat. 733:

> "...granted to the United States...all the right, title and interest of the Indians in and to the Tribal and allotted lands of the...Chemehuevi Reservation in California as may be designated by the Secretary of the Interior."

The Act required the Secretary to determine the amount of money to be paid as "just and equitable compensation for the rights granted..." to the United States, and that such amount shall be paid by MWD in accordance with the aforementioned contract.

The lands granted to the United States included a portion of the land previously allotted to the Indians (see Appendix 1102 for text of Act).

By letter dated October 9, 1940, the Secretary approved appraisal evaluations of the Chemehuevi lands based on a metes and bounds description prepared by MWD. The evaluation included a freeboard area

above the 450-foot contour which was the projected elevation of the maximum pool level of Lake Havasu. The compensation was fixed at $108,104.95.

On November 25, 1941, the Secretary approved the description of the Reservation lands surveyed by MWD which were to be taken, a part of which comprised the Havasu shoreline lands.

The Act of October 28, 1942, 56 Stat. 1011, granted the United States rights similar to those granted in the aforesaid Act of July 8, 1940, for the construction, operation and maintenance of electric transmission lines and other works for the Parker Dam power project, and required the payment of compensation therefor (see Appendix 1103 for text of Act).

E.3 Special Use Permit

In an effort to meet the Tribe's complaints that access to Lake Havasu was cut off, on December 28, 1973, the Department granted the Indians a Special Land Use Permit for the shoreline, subject to existing rights, pending further study of the Indians' rights. The issuance of the permit was protested by the Resources Agency of the State of California by letter dated June 7, 1974.

E.4. Departmental Actions

The Department's further study resulted in a Solicitor's Opinion dated August 15, 1974, to the Secretary which concluded that the Secretary had designated more land than was necessary or desirable to be taken and that the Secretary could legally modify the prior designation and delete lands not permanently flooded.

On the same date the Acting Secretary of the Interior, John C. Whitaker, made a determination to correct the designation previously made by Secretary Ickes on November 25, 1941, and confirmed that the Chemehuevi Indians had full equitable title to all the lands within the Reservation riparian to Lake Havasu between the north and south boundaries described in the determination. Thus, the Secretary transferred title to the major part of the shoreline lands to the Chemehuevi Indian Tribe, approximately 16 miles in length, subject to certain rights of the United States, MWD, and of existing permittees. Approximately 5 miles of shoreline were left in the Havasu National Wildlife Refuge (see Appendix 1104 for text of Order).

The August 15, 1974, determination of the Acting Secretary was followed by a Secretarial Order dated November 1, 1974, which

> "corrects the designation by Secretary Ickes of November 25, 1941, that certain lands of the Chemehuevi Indian Reservation should be taken for use in the construction of Parker Dam...the Chemehuevi Tribe has full equitable title to all those lands within the Chemehuevi Indian Reservation designated to be taken by Secretary Ickes in 1941 between the operating pool level of Lake Havasu on the east (elevation 450 m.s.l.) and the following north and south boundaries:" (see Appendix 1105 for text of order).

The effect of the Order was to transfer the southern 2 miles of shoreline to the Indian Tribe but the northern 4 miles of shoreline would remain under control of the Fish and Wildlife Service. Thus, the Tribe alleges that the Reservation encompassed an additional 150 acres of irrigable lands with a diversion duty of 5.97 acre-feet per acre.

E.5. Litigation

In an action entitled *Havasu Landing, Inc., et al.*, v. *Morton, Secretary of the Interior*, Civ. 74-3565, the plaintiffs sought a temporary restraining order and preliminary injunction against implementing the Order of the Secretary dated August 15, 1974. Plaintiff's memorandum in support thereof alleged that the lands purported to be transferred by the Order consist of approximately 2,340 acres which include approximately 22 miles of land bordering the Colorado River and Lake Havasu; that the Secretary's purported grant constituted a gift of Federal lands; that Congress alone can dispose of Federal property; that the action impaired plaintiff's rights under a concession contract lease with an option for 20 more years; and that it violated the National Environmental Policy Act in that the Environmental Impact Statement which had been prepared was deficient.

However, following a settlement between the plaintiff and the Tribe, the parties, on June 22, 1976, stipulated for dismissal of the action with prejudice.

E.6. Special Master's Findings

The Special Master in *Arizona* v. *California*, 376 U.S. 340, found that there were 1,900 acres of irrigable Reservation land which, together with related uses, have a maximum annual diversion requirement of 11,340 acre-feet of Colorado River water (page 267 of Special Master's Report, dated December 5, 1960). This finding, of course, preceded the Secretarial Order of November 1, 1974.

F. Cocopah Indian Reservation

F.1. Background

The Cocopah Indian Reservation, with approximately 431 irrigable acres located in Arizona, was established by Executive Order 2711, dated September 27, 1917. It then contained approximately 446 acres. The Executive Order provided:

"It is hereby ordered that the west half of the south-east quarter of section twelve and the west half of the north-east quarter of section thirteen, township ten south, *lots two, four, five and six, together with such vacant, unsurveyed and unappropriated public lands adjacent to the foregoing described subdivisions and between the same and the waters of the Colorado River as would, upon an extension of the lines of existing surveys, constitute fractional portions of the north-east quarter and north-west quarter of Section thirty, township nine south of range twenty-four west of the Gila and Salt River Meridian, Arizona*, be, and the same are hereby withdrawn and set apart for the use and occupancy of Cocopah Indians, subject to any valid prior existing rights of any person or persons thereto, and reserving a right-of-way thereon for ditches or canals constructed by the authority of the United States (emphasis added)."

F.2 Boundary Questions

There have been differences of opinion regarding interpretation of the Executive Order. One interpretation is that the Executive Order gave everything to the Cocopah Indians between the Colorado River and the subdivision mentioned. The second interpretation is that reference to fractional portions of the northeast quarter and the northwest quarter of section 30 are words not merely of description but of limitation, and that the Indians could not, therefore, claim any land west of section 30.

In a memorandum dated February 26, 1954, the Area Counsel of the Bureau of Indian Affairs questioned whether the Executive Order's description of the lands in the Reservation included an accreted area lying between the Colorado River and west of the subdivisions identified in the Order and suggested referring the matter to the Solicitor. The referral resulted in a Solicitor's Opinion to the Commissioner of Indian Affairs (M-36275) of April 15, 1955, which concluded that:

"...the Indians have no right to the accreted lands west of
the boundary fixed by the Executive Order...."

The Solicitor's Opinion stated that it was known at the time of the Executive Order that there was already a sizeable area of accreted land between the river and unsurveyed Section 30; hence, the restrictive language in the Order would be superfluous and without meaning which defined the western boundary of the Reservation to include such land "...as would, upon an extension of the lines or existing surveys, constitute fractional portions of the northeast quarter and the northwest quarter of section thirty, township nine south of range twenty-four west of the Gila and Salt River Meridian, Arizona."

In effect, E.O. 2711 was held to establish the west boundary of the Reservation as the west boundary of Section 30, T. 9 S., R. 24 W.

F.3 Act Enlarging Reservation

Public Law 87-150, Act of August 17, 1961, 75 Stat. 387, granted to the Cocopah Indians in Arizona 81.64 acres of public domain adjacent to the Executive Order Reservation. This area included Lots 14 and 15, Section 30, T. 9 S., R. 24 W., G&SRM, and Lots 3, 4, and 5, Section 25, T. 9 S., R. 25 W. However, the priority date for the right to water therefor is not resolved.

The purpose of the legislation was to add lands to the Reservation which had long been occupied by the Indians and had been thought by the Indians to be Reservation lands. Public Law 87-150 was designed to cure the defect in the Indians' title to the land as set out in the Solicitor's 1955 Opinion. It extended the Reservation westward to an old Reclamation levee constructed about 1907, but not to the river since the levee prevented the river from shifting east (see Appendix 1106 for text of Act).

F.4. Litigation

On October 12, 1970, the Native American Rights Fund, on behalf of the Cocopah Tribe, initiated "*Cocopah Tribe of Indians* v. *Walter J. Hickel*, No. Civ. 70-573-PHX-WEC, U.S.D.C., District of Arizona." The action alleged that Executive Order 2711 of September 27, 1917, established the western boundary of the West Cocopah Reservation as the water course of the Colorado River. It also claimed about 1,000 acres of land extending to the changed channel of the river as accretion to lands of the Cocopah Indian Reservation.

F.5. Departmental Actions

Efforts were initiated within the Department of the Interior to provide administrative relief to the Indians.

On December 21, 1972, in Opinion M-36867, the Solicitor advised the Assistant Secretary for Public Land Management that he differed with the 1955 Solicitor's Opinion. He concluded that the reference in the Executive Order to fractional portions of quarters of Section 30:

> "...were words of description and not of limitation and that the Reservation as created by the Executive Order of September 27, 1917, extended to the Colorado River. The Solicitor's Opinion of April 15, 1955, M-36275, is therefore reversed."

On the basis thereof, on December 29, 1972, the Assistant Secretary issued an Opinion that the western boundary of the Reservation at the date of the Executive Order creating the Reservation, September 27, 1917, was the Colorado river, notwithstanding the fact that there were lands in existence on that date between the Colorado River and what would have been the western line of Section 30 had the public survey lines been extended. He ordered the official records to be noted accordingly. The effect of the action was to add approximately 900 acres to the Reservation.

Despite this Departmental action, the Cocopah Tribe desired a stipulated judgment in its aforenoted action against the Secretary even though the Department of Justice felt such a judgment was inappropriate. In this regard, the Bureau of Reclamation was concerned about protecting facilities it had constructed in this area. These included its older levee constructed between 1905 and 1912, its railroad constructed in 1914 on that levee, its newer levee constructed in 1950 to the west or on the river side of the old levee, the need for an effluent discharge channel west of the 1950 levee required in connection with water deliveries to Mexico, and for rights-of-way for irrigation and drainage facilities.

On May 12, 1975, Judge Craig, in a "Final Judgment," stated he had reviewed the file and the stipulation of counsel that this judgment be executed and granted plaintiff's motion for summary judgment. He ordered and declared that the Reservation, "as established by the Executive Order of September 17, 1917, was and is riparian to the Colorado River and includes any land added to its boundaries by accretion...." The judgment awarded the Tribe approximately 883 acres of accreted lands adjacent to the Reservation of which approximately 780 acres are alleged by the Tribe to be irrigable with a diversion right of 6.39 acre-feet per acre. No appeal was sought.

On March 2, 1976, Reclamation paid the Tribes $15,394.83 which had been included in the Public Works Appropriation Act, Public Law 94-180, dated December 26, 1975, for Reclamation's taking of the Reservation land for its levee and the return of rental fees collected by BLM from permits on Indian lands (see memorandum of January 27, 1976, from Reclamation to the Native American Rights Fund).

F.6. Act Enlarging Boundaries

In the Congressional consideration of the Colorado River Basin Salinity Control Act, 88 Stat. 266, dated June 24, 1974, Public Law 93-320, the Tribe urged the inclusion of a provision which became Section 102(e) of that Act. The Tribe was thereby successful in obtaining the addition of approximately 360 acres of lands to its Reservation along its southern boundary, and the construction of three bridges across the aforementioned drainage channel which would hinder its access to the river which was already impaired by the two levees and railroad (see Appendix 1403 for text of Act). A priority date as to water therefor remains to be resolved.

F.7. Special Master's Findings

The Special Master in *Arizona* v. *California*, 376 U.S. 340, found that there were 431 acres of irrigable Reservation land which, together with related uses, have a maximum annual diversion requirement of 2,744 acre-feet of Colorado River water (pages 267 and 268 of Special Master's Report dated December 5, 1960). This acreage did not include the area added to the Reservation by the Departmental Order of December 29, 1972, the aforesaid litigation or by the two later Acts of Congress.

G. Colorado River Indian Reservation

G.1. Background

The Colorado River Indian Reservation, which has approximately 9,213 practicably irrigable acres in California and 99,375 practicably irrigable acres in Arizona, was established by an Act of March 3, 1865, 13 Stat. 559, which initially set apart 75,000 acres in the Territory of Arizona for an Indian Reservation. The boundaries were later changed by Executive Orders of November 22, 1873 (by which adjoining bottom lands in the Territory of Arizona were added to the Reservation), November 16, 1874 (by which lands on the westerly side of the Colorado River were added), May 15, 1876, and November 22, 1915.

G.2. Western Boundary Question

The provision in the Executive Order of November 16, 1874, which enlarged the Reservation to include lands on the westerly side of the Colorado River in the State of California, was as follows:

"...thence southwesterly in a straight line to the top of Riverside Mountain, California; thence in a southeasterly direction to the point of beginning...."

However, the boundary line as defined in the Order crossed the Colorado River twice in returning to the place of beginning and cutoff a large tract on the east side of the river which was being settled by non-Indians. This led to a decision by the Secretary of the Interior to redefine the western boundary so as to make the Colorado River the boundary line (see page 270, Special Master's Report of December 5, 1960, in *Arizona* v. *California*, 373 U.S. 546).

This redefinition was done by the Executive Order of May 15, 1876, which described the western boundary as follows:

"...thence southwesterly in a straight line to the top of Riverside Mountain, California; thence in a direct line toward the place of beginning *to the west bank of the Colorado River; thence down said west bank* to a point opposite the place of beginning..."

(emphasis added).

However, the precise line of the western boundary still presented a problem.

G.2.1 Benson Line

In 1879, U.S. Surveyor W. F. Benson established a meander line common to Sections 25 and 36, T. 2 S., R. 23 E., SBM, at a point on the west bank of the Colorado River which also fell on the line between the top of Riverside Mountain and the place of beginning of the Reservation as described in the Executive Order. He also surveyed the west boundary of the Reservation from Section 25 south through Section 12, T. 5 S., R. 23 E. This is known as the "Benson Line area."

G.2.2 Manmade Avulsive Changes

The western boundary situation was further complicated by the fact that there were two manmade avulsive changes: the "Olive Lake Cutoff" constructed in 1920, and the "Ninth Avenue Cutoff" constructed in 1943, each cutoff changing the course of the river to the east.

The Olive Lake Cutoff left 2,058 acres of irrigable Reservation land lying west of the present west bank of the river and east of the river's west bank as it existed in 1920, and the "Ninth Avenue Cutoff" constructed in 1943, each cutoff changing the course of the river to the east.

The Olive Lake Cutoff left 2,058 acres of irrigable Reservation land lying west of the present west bank of the river and east of the river's west bank as it existed in 1920 prior to the cutoff (see Special Master's Report, page 271 in *Arizona* v. *California*; but see Interior's 1973 survey, which showed 1,690 acres to the median line of the abandoned channel). The Ninth Avenue Cutoff left 222 acres similarly situated (see Special Master's Report, page 272; but see Interior survey, which showed 149.86 acres to the meridian line of the abandoned Channel). In addition, there are 5,933 acres of irrigable Reservation land in the northern West Side Area to the north of the intersection of the Reservation's westerly boundary and west bank of the Colorado River.

Thus, there is an aggregate of 8,213 acres of irrigable Reservation land west of the present west bank of the river which have a maximum annual diversion requirement of 54,746 acre-feet. This acreage, when added to the 99,375 acres of irrigable Reservation lands east of the present west bank of the Colorado River, which have a maximum annual diversion requirement of 662,402 acre-feet, results in an aggregate of 107,375 acres of irrigable Reservation land, which, together with related uses, have a maximum annual diversion requirement of 717,148 acre-feet (see pages 271 through 274, Special Master's Report dated December 5, 1960).

G.3. Departmental Actions

The boundary problems involve the point

"...at which the line from the top of Riverside Mountain reaches the west bank of the Colorado River, and whether the west bank position is fixed or changes with the movements of the river." (Solicitor's Opinion, January 17, 1969.)

Consequently, in response to a request from the Colorado River Indian Tribes that the western boundary be determined, the Solicitor of the Department of the Interior rendered his Opinion to the Secretary on January 17, 1969.

The Solicitor's Opinion described the history of the dispute as follows:

"During the trial of *Arizona* v. *California* et al., the United States claimed water rights for an extensive area of irrigable lands along the west side of the river. California resisted the claim of the United States for any lands south of section 25, T. 2 S., R. 23 E., on the grounds that there were no such lands within the boundary of the Reservation. California's contention was based upon the fact that the west bank of the river, which was the call of the west boundary of the Reservation in the Executive Order of May 15, 1876, established a boundary that would change with movements of the river. The United States contended, among other things, that this Executive Order established a permanent and unchanging boundary along the west bank of the river as it existed in 1876.

"The Special Master ordered that the proper position of the boundary be litigated and, following trial, the Special Master made Findings of Fact and Conclusions of Law which, in effect, held that the Executive

Order of May 15, 1876, established a boundary which changes as the course of the Colorado River changes, except when such changes are due to an avulsion. He further held that two avulsive changes had severed lands from the Reservation and placed these lands on the west side of the river. The effect of the Master's holding was to disallow any claim of the United States for water for lands south of section 25, T. 2 S., R. 23 E., which were located on the west side of the Colorado River except in the two areas the Master found to have been severed from the Reservation and placed on the west side of the river by man-made avulsive changes in the river's course.

"Before the Supreme Court, California excepted to the Findings of Fact and Conclusions of Law of the Special Master. In ruling thereon, the Supreme Court disagreed with the Special Master's decision to determine the disputed boundary of the Colorado River Indian Reservation. *Arizona* v. *California* et al., 373 U.S. 546, 601 (1963). The effect of the Supreme Court's decision was to leave the boundary question open for future determination."

The Solicitor concluded that "the top of Riverside Mountain" means the highest point of that mountain and a 1912 survey by R. A. Farmer of that supposed monument was suspended. He stated that the call from that point to the west bank must be taken to mean the line of ordinary high water as it existed in 1876. The Solicitor then adopted a meander corner common to sections 25 and 36, T. 2 S., R. 23 E., SBM, established by W. F. Benson in 1879, at a point on the west bank of the river which also fell on the line between the highest point on Riverside Mountain and the place of beginning.

The Solicitor concluded that the Reservation boundary follows the western bank of the river at the line of ordinary high water as it existed at the time of the issuance of the Executive Order of May 16, 1876, subject to the application of the doctrine of erosion and accretion and avulsion to any intervening changes. And, finally, the Solicitor concluded that at the time of the Executive Order of May 15, 1876, the United states owned the area between ordinary high water mark and low water mark and these were included in the Reservation (see Appendix 1107 for text of Opinion).

The Solicitor's opinion of January 17, 1969, was followed by a Secretarial directive of the same date which suspended certain surveys of record (i.e., 1913 and 1964) which did not properly locate the boundary line, and reinstated other surveys (i.e., 1874, 1958, and 1962) in order to conform the Reservation boundaries to the conclusions reached in the Solicitor's Opinion (see Appendix 1108 for text of Order).

Although Secretary Hickel suspended this Order on June 4, 1969, the suspension was lifted on June 2, 1970.

G.4. Litigation

The United States initiated several civil actions in the United States District Court, Central District of California, including those named below, to, among other things, recover possession of real property and premises as the owner in trust for the Colorado River Indian Tribes, said lands having been reserved as a part of the Colorado River Indian Reservation by the Executive Order of May 15, 1876. Judgments were entered pursuant to stipulations of the parties affirming ownerships in the United States in trust for the Tribe.

U.S. v. *Curtis*, Civ. No. 72-1624 - DWW - Judgment entered January 10, 1977.

U.S. v. *Brigham Young University*, Civ. No. 72-30580 DWN - Judgment entered December 16, 1976.

U.S. v. *Aranson et al.*, Civ. No. 72-1621 - R.C.D. Cal. - The judgment therein entered February 19, 1977, involving the 2,058 acres in the Olive Lake Cutoff, has been appealed and is pending in the U.S. Court of Appeals.

G.5. Special Master's Finding

Finally, the Special Master's Report, page 272, in *Arizona* v. *California*, 376 U.S. 340, 345, found that, for the benefit of the Colorado River Indian Reservation, the United States had the right to the annual diversion of a maximum of 717,148 acre-feet for 107,588 acres and for the satisfaction of related uses. The Supreme Court modified this finding by providing that those quantities were subject to appropriate adjustment by agreement or decree of the Court in the event the boundaries are finally determined.

It is the position of the Tribe and of Interior that the boundary question is now settled and that the irrigable acreage in the "enlarged area" should be accorded a present perfected right as that term is defined in the Decree in *Arizona* v. *California*. The Tribe alleges that the additional area comprises 4,439 acres, of which 2,710 acres are practicably irrigable and have a diversion duty of 6.67 acre-feet per acre or 18,076 acre-feet of water (see Motion of Tribe to Intervene dated April 10, 1978).

H. Fort Mohave Indian Reservation

H.1. Background

Based on a survey in 1869 by Army Lieutenant Wheeler, the Hay and Wood Military Reserve at Camp Mohave was created by an Executive Order of March 30, 1870 (see Appendix 1109 for text of Order). It became the Fort Mohave Indian Reservation pursuant to an Executive Order of September 9, 1890, which specified that the Reserve would include 9,114 acres (see Appendix 1110 for text of Order). Lands were added thereto by an Executive Order of December 1, 1910 (see Appendix 1111 for text of Order).

H.2. Question of Western Boundary

The western boundary of the Reserve was questionable due to a conflict in the calls in the notes of survey accompanying the Executive Order. When laid out the call to the monuments would fix a line at or near the left or east bank of the river, whereas adherence to calls for courses and distances would require a boundary line in the foothills to the west of the Colorado River.

In 1928, a General Land Office survey, known as the "Blout Survey," resolved the conflict in favor of the call to artificial monuments, thus establishing the boundary on the east side of the river. The effect thereof was to reverse the 1869 Wheeler survey by moving the west line of the Reservation to the river approximately 1¼ miles to the east. About 3,500 acres were thus removed from the Reservation.

In 1896 the General Land Office (GLO) had awarded a portion of the Hay and Wood Reserve to California under the Swamp and Overflow Act, and the State issued patents to these lands to non-Indians. On April 27, 1959, the State filed an application with BLM to select approximately 1,500 acres of the 3,500 acres "severed" from the Reservation.

H.3. Special Master's Report

The Special Master in *Arizona* v. *California*, 373 U.S. 546, found that the Blout line, which substantially reduced the size of the Reservation, was the correct western boundary. He also found that in withdrawing lands for the Fort Mohave Indian Reservation the United States intended to reserve rights to the use of so much water from the Colorado River as would be necessary to irrigate all the practicably irrigable acreage thereon and to satisfy related uses.

The Special Master found that there are 14,916 acres of "practicably irrigable" land in Arizona which, together with related uses, have a maximum annual diversion requirement of 96,416 acre-feet; that there are 1,939 acres of such land in Nevada, with a maximum annual diversion requirement of 12,534 acre-feet; and 2,119 acres in California with a maximum annual diversion requirement of 13,698 acre-feet; the latter quantities subject to reduction by the quantity of 6.4 acre-feet per acre of irrigable accreted land owned by owners of patented lands and not included with the Reservation.

These aggregate a maximum of 18,974 irrigable acres with a maximum annual diversion requirement of 122,648 acre-feet, subject to reduction as indicated as to lands accreted to patented lands (see pages 279 through 287, Special Master's Report, December 5, 1960).

In 1963 the Supreme Court ruled that the Special Master's determination as to the boundary was not necessary and held it in abeyance.

H.4 Departmental Actions

On April 17, 1974, the Associate Solicitor, Indian Affairs, advised the Commissioner of Reclamation that the Blout survey was not controlling, that the Wheeler line was correct, and that the Reservation encompassed a full 9,114.81 acres.

On June 3, 1974, the Solicitor of the Department of the Interior advised the Secretary that the western boundary of the Reservation was most accurately reflected by the courses, distances and acreage descriptions contained in the plats and notes of survey which accompanied the Executive Order of March 30, 1870. This moved the western boundary to the west of the Colorado River. The Solicitor further advised that to resolve the disputes, it would be necessary to declare null and void the previous 1928 resurvey of the western boundary by Sidney Blout of the GLO, approved by the GLO in 1931, which upheld the call to artificial monuments and fixed the boundary on the east side of the river (see Appendix 1112 for text of Opinion).

In a directive of the same date, June 3, 1974, the Secretary acted affirmatively on the Solicitor's Opinion. The directive nullified the 1928 Blout resurvey and plat and accepted the western Reservation boundary as defined by courses, distances and acreage as described in the plats and notes of survey accompanying the Executive Order of March 30, 1870; i.e., it fixed the boundary west of the river (see Appendix 1113 for text of Order).

The Tribe alleges that the Secretarial Order recognizes that an additional approximately 3,580 irrigable acres were part of the Reservation and are entitled to a diversion duty of 6.64 acre-feet of water, with a priority date of September 19, 1980 (see Tribe's Motion for Leave to Intervene, filed December 23, 1977, with the Supreme Court).

Both prior and subsequent to the 1928 survey, the GLO had patented lands adjacent to the Reserve and which are now within the enlarged Reserve after the western boundary was relocated westward.

A plat of Corrective Survey was accepted by BLM on March 2, 1977.

I. Conclusion

As stated in an Appendix to a memorandum of October 18, 1977, from Interior's Solicitor to the Assistant Attorney General, Land and Natural Resources Division, Department of Justice, which provided Interior's recommendations on the position which the United States should assert in responsee to the Joint Motion of Arizona, California and Nevada on a proposed Stipulation on present perfected rights, Interior has taken all the administrative steps within its power to resolve the four aforenoted boundary disputes.

It was further pointed out that while the Special Master found it necessary to determine the disputed boundaries of the Colorado River and Fort Mohave Indian Reservations, the Supreme Court did not. It stated:

> "We disagree with the Master's decision to determine the disputed boundaries of the Colorado River Indian Reservation and the Fort Mohave Indian Reservation. We hold that it is unnecessary to resolve these disputes here. Should a dispute over title arise because of some future refusal by the Secretary to deliver water to either area, the dispute can be settled at that time. *Arizona* v. *California*, 373 U.S. 546, 601 (1963)."

It was Interior's view that the United states could assert additional claims for the Colorado River and Fort Mohave Indian Reservations under Article II(D)(5) of the Decree. The Article provides:

> "...shall be subject to appropriate adjustment by agreement or decree of this Court in the event that the boundaries of the respective reservations are finally determined." *Arizona* v. *California*, 376 U.S. 340, 345 (1964).

Finally, Interior was of the view that the Court would be receptive to a motion under Article IX of the Decree of claims for additional rights for the areas added to the Cocopah and Chemehuevi Indian Reservations. That Motion for Modification of the Decree (of March 9, 1964) was filed with the Supreme Court on December 21, 1978. The details of those claims are elaborated on in Chapter I, K. entitled "Summary of 'The Law of the River,' " and in Chapter X, entitled "Present Perfected Rights." A summary appears in Chapter XI, D. herein.

CHAPTER XII

COLORADO RIVER BASIN PROJECT ACT SEPTEMBER 30, 1968

A. Background

The Supreme Court of the United States issued its Opinion in *Arizona* v. *California et al.*, on June 3, 1963. Among other things, the Opinion established Arizona's right to 2.8 maf per year of Colorado River mainstream water if sufficient water is available to satisfy 7.5 maf of annual consumptive use from mainstream waters in the Lower Basin without regard to Lower Basin tributaries.

B. S.1658 - 88th Congress to Authorize CAP

On June 4, 1963, the day after the Supreme Court Opinion, Senators Hayden and Goldwater of Arizona introduced S.1658 which would authorize construction of the Central Arizona Project (CAP) (see Appendix 1201 for its text). CAP's principal works would include Bridge Canyon Dam; Maxwell Dam; Buttes, Hooker and Charleston Dams; and the Tucson and Salt-Gila Aqueducts. Bridge Canyon would furnish power for pumping CAP water and its revenues would help defray the costs of CAP. S.1658 provided for repayment of reimbursable costs within 50 years, established an interest rate for costs allocable to commercial power and municipal and industrial water supply, provided for public recreational facilities, fish and wildlife conservation, area redevelopment, and retained the existing "Law of the River." The bill did not provide for the later controversial provisions such as augmentation of the mainstream supply nor did it include Marble Canyon Dam or any part of a Basin-wide development plan. Identical bills were introduced in the House by Arizona's Congressman. However, Secretary of the Interior Udall publicly advocated a regional plan of which CAP would be a part.

Hearings on S.1658 were held before the Subcommittee on Irrigation and Reclamation on August 27 and 28 and October 1 and 2, 1963. It was contemplated that only officials of the Department of the Interior would appear initially to discuss economic and engineering details of CAP but that later hearings would more fully develop the record.

Subcommittee Chairman Senator Moss of Utah noted that the Bureau of Reclamation's 1947 original planning report for CAP had been updated with funds advanced to Reclamation by Arizona in January 1962, though the report had not yet been cleared by the Department, and that a fact sheet based on that report was before the Committee. Changes in some details of the report had been made because of developments since the original bill; e.g., several sediment control dams were eliminated because construction of Glen Canyon Dam made them unnecessary; whereas, in 1947 only 1 percent of CAP water was estimated for municipal and industrial use, in 1962, approximately 33 percent of CAP water was estimated for M&I use because of population increases; and Bridge Canyon Dam was redesigned as a thin arch structure. The percentage of M&I water increased even more by 1968.

The proponents of the bill emphasized that Arizona's economy with its fast growing population was threatened with disaster unless additional water was available; that CAP was a rescue operation and would not irrigate new lands; that municipal and industrial uses exceeded the available water supply; and the ground-water pumping of 3.5 maf per year exceeded the annual recharge of 1.0 maf and could not continue.

C. Permits for Bridge Canyon and Marble Canyon Dams

Although Arizona had initially filed in 1939 for a permit to build Bridge Canyon Dam, the Arizona Power Authority (APA) sought a permit in August 1958 from the Federal Power Commission (FPC) for construction of Bridge Canyon and Marble Canyon Dams on the Colorado River. The City of Los Angeles also sought a license for Bridge Canyon Dam. Interior opposed both applications as inconsistent with its Pacific Southwest

Water Plan (PSWP), a regional development plan whose financial success depended on revenues derived from the sale of power and energy generated at those sites. California also opposed the requests for permits. The National Parks Association and the Sierra Club of California opposed both dams for environmental reasons. Nevertheless, in September 1962, a hearing examiner recommended issuing a license to APA to build Marble Canyon Dam.

To delay such a grant and to provide time to allow Congress to act on the CAP authorization which included Bridge Canyon Dam, Senator Hayden introduced S.502 on January 24, 1963, to withdraw jurisdiction from FPC to grant licenses for dams in the reach of the river from Glen Canyon Dam to the Mexican border. A companion bill, H.R.9752, was introduced in the House by Congressman Rhodes of Arizona. APA and the Arizona Interstate Stream Commission were in dispute over the role each envisioned for these dams, but in March 1962, the Arizona Legislature sided with the Stream Commission and memorialized Congress to pass S.502. Congress did so in July 1964 and the bill was signed on August 27, 1964, as Public Law 88-491, with the period of prohibition on the issuance of permits extending through calendar year 1966.

D. Objections to S.1658

In a letter of August 21, 1963, the Bureau of the Budget stated it had no basis for appraising the merits of the proposed project since the Department of the Interior had not submitted a report to the Bureau of the Budget under the procedures set forth in Executive Order No. 9384, 8 F.R. 13782, dated October 4, 1943, and for that reason recommended that action on S.1658 be deferred.

Senator Kuchel of California emphasized that the hearings did not comply with the Flood Control Act of 1944, Public Law 78-534, dated December 22, 1944, 58 Stat. 887, which required a Departmental report and the receipt of comments thereon within 90 days thereafter from the affected States prior to the hearing; that a decree had not yet been issued in *Arizona* v. *California* (the decree was handed down on March 9, 1964); and that the petitions for rehearing filed by the State of California, The Metropolitan Water District, and Imperial Irrigation District, would soon be filed (these were filed on September 16 and were denied by the Supreme Court on October 21, 1963) and would need to be acted upon prior to hearings. He noted that on August 26, 1963, the day before the Subcommittee hearing, Secretary Udall had released a Departmental report on the Pacific Southwest Water Plan (PSWP), which was a comprehensive plan, regional in scope, covering the Lower Colorado River Basin and Southern California. It included CAP as an integral unit but differed from S.1658 in that the revenues from Bridge Canyon Dam Powerplant would be utilized for the whole southwest area and not just for CAP, and that CAP power for pumping would be derived from Marble Canyon Dam to be built under PSWP (see pages 11 through 32, Senate Hearings on S.1658, August 27, 1963). It was Secretary Udall's position that CAP was part of a larger, regional problem (see Interior's report of April 9, 1964, to Senator Jackson on S.1658 and PSWP), although it should be noted that Congressman Aspinall, Chairman of the House Interior and Insular Affairs Committee, had written the Secretary on January 18, 1968, suggesting a regional approach.

Senator Kuchel's other major contention throughout the hearings was that California's rights to 4.4 maf per year for existing uses be given a priority over CAP, a new project, similar to the priority accorded existing Arizona uses over CAP uses, by the March 1961 Arizona Legislature in appropriating $200,000 to update the CAP report. Senator Kuchel's proposed amendment of S.1658 to provide such a priority was drafted by California's Attorney General Mosk (it appears at page 274, Senate Subcommittee Hearings, April 9, 1964, and was incorporated in the record at page 339, April 10, 1964). His stated reason therefor was that existing California water uses through non-Federally financed facilities should not be prejudiced by subsequent new uses in Arizona. He urged that the States "ought to get together" and have Congress assist the people in the entire southwest (see pages 87, 104, Senate Hearings on S.1658, August 28, 1963). The demand for this priority was a cornerstone of California's position and was ultimately adopted.

E. Pacific Southwest Water Plan (PSWP)

On April 9, 1964, the Bureau of the Budget reported to the Senate Committee on Interior and Insular Affairs on both PSWP and S.1658, but in the absence of further study could not recommend authorization of

either. On the same day, Secretary Udall presented the Committee with a draft PSWP bill and an analysis as an interim report pending resolution of several major issues and uncertainty of support for a regional plan.

The PSWP would:

(1) Establish as congressional policy a regional approach to the water problems of the Pacific Southwest. It would supply up to 1.2 maf of water per year from northern California to make up deficiencies in the 4.4, 2.8, and 0.3 maf apportioned annually to California, Arizona and Nevada, respectively, in the Supreme Court Opinion in *Arizona* v. *California*. The United States would not, however, be an insurer or guarantor of a supply of water in a legal sense.

(2) Establish a Basin development fund which would constitute the bank account to finance the objectives of the Act. Hoover Dam and Parker Dam revenues after their payouts would go into this fund.

(3) Authorize the Bridge Canyon and Marble Canyon power projects with revenues therefrom also to go to the development fund.

(4) Authorize programs to salvage approximately 800,000 acre-feet of water annually.

(5) Authorize CAP to bring approximately 1.2 maf per year of water to central Arizona and to bring water, through exchange and construction of Hooker Dam, to New Mexico

(6) Enlarge the capacity of the Central Valley facilities in California, then under construction, and the California State water project aqueduct by 1.2 maf to bring northern California water to southern California. It was Deputy Solicitor Weinberg's opinion that California law would not preclude Congressional authorization of a Federal project to utilize unappropriated California water (see page 485, Senate Hearings, April 17, 1964). The Attorney General of California concurred in that opinion (pages 594 through 596, Senate Hearings, Appendices) as did California Chief Deputy Director Goldberg, Department of Water Resources (pages 611 through 613, Senate Hearings, Appendices). Senator Kuchel attempted to but did not then elicit a clear answer to his question as to whether the acreage limitation provisions of Reclamation Law; i.e., the "excess land laws," would apply to the California State water project (see pages 350 through 381, April 10, 1964, and page 422, April 14, 1964).

(7) Authorize the Southern Nevada and Moapa Projects in Nevada.

(8) Authorize the Dixie Project in Utah.

(9) Enlarge outdoor recreational and fish and wildlife facilities utilizing an additional 340,000 acre-feet of water (page 341, Hearings, April 13, 1964).

(10) Increase Indian irrigation developments in Arizona and California utilizing an additional 400,000 acre-feet per year.

(11) Establish a Pacific Southwest Regional Water Commission

In testimony on April 13 and 14, 1964, California stated its opposition to S.1658, as a separate CAP bill and supported a regional solution primarily because of the need for augmentation of the mainstream water supply (pages 415 through 417, Senate Hearings, April 14, 1964). The need for augmentation was a cornerstone of California's position, the other being a priority for 4.4 maf over CAP. While California preferred the regional approach, it felt that if S.1658 authorizing only CAP were to be considered, the Kuchel amendment subordinating CAP to existing uses was needed (see Ely statement, pages 505 through 538, Senate Hearings, April 20, 1964). Secretary Udall, however, thought the Kuchel amendment destroyed "the economic feasibility of any proposal for projects in Arizona or Nevada" (pages 467 through 474, Senate Hearings, April 16, 1964).

F. S.2760 - 88th Congress

On April 22, 1964, Senator Kuchel introduced his bill, S.2760, which had the approval of all the southern California users of Colorado River water and some of the other water interests in California. Although California's legislature opposed the Udall plan, Governor Brown said it was acceptable with modifications. Senator Kuchel's bill substantially accepted seven of the above-listed features of the Udall PSWP including authorization of CAP but also proposed the following major changes (see pages 306 through 308, Senate Hearings on S.1658, April 9, 1964):

(1) The source of a supplemental water supply would be broadened to other areas and not limited to northern California. The source would depend on the Secretary's investigations. The possible utilization of Columbia River water was strongly opposed by Senator Jackson of Washington.

(2) The imported water would be delivered directly into the Colorado River and not into the California State water project aqueduct. This would permit continued use of the MWD Aqueduct; all water apportioned to California under the Decree would come from one source; i.e., the Colorado River, and water quality would be improved. These two changes were the principal reasons for California's objections to PSWP.

(3) CAP as a new project would bear all shortages as junior in right to existing uses and decreed rights and to 4.4 maf of such uses in California; i.e., permanent protection of existing uses.

(4) Postponement of some of the proposed expansion of reclamation on Indian Reservations and proposed expansion of consumptive uses for wildlife refuges.

(5) The Secretary would report upon the water supplies and requirements of the seven Colorado River Basin States, not just the Lower Basin States, in order "to meet in full the deficiencies in water supply."

California urged Arizona to join it in augmenting the supply of water in the river so that CAP could be a part of a regional plan California could advocate (pages 511 through 513, Senate Hearings on S.1658, April 20, 1964).

On April 23, 1964, Senator Goldwater testified before the Senate Subcommittee that he and Senator Hayden were not opposed to a regional plan provided that CAP had a first priority and that the regional plan would not be used to delay CAP (page 575, Senate Hearings on S.1658, April 23, 1964).

G. Was California's Priority an Effort to Overrule Arizona v. California?

In connection with California's advocacy that CAP be subordinated to California's existing rights up to 4.4 maf, Senator Anderson asked whether California was not "trying to do legislatively what you (California) lost in the Supreme Court?" and "are you not asking us to override the decision of the Supreme Court?" (page 519, Senate Hearings on S.1658, April 21, 1964). California's response was that the Supreme Court:

"...did not decide the shortage issue at all; it remitted that question to the Congress. The Special Master did undertake to decide it and he said in the event of shortages the shortage should be prorated. The U.S. Supreme Court unanimously—and this was the only issue upon which they were unanimous—rejected the Special Master's holding that the Boulder Canyon Project Act required proration of shortages. It said there was as yet no law on this subject; that Congress had not established a shortage formula, but had left that question in the first instance for the Secretary of the Interior and that Congress might enlarge or restrict his authority. In any event, the Court will review the Secretary's formula."

* * * *

"There is no formula now in existence for treating water shortages in the Lower Basin. This committee has that problem before it is a matter of first instance. The problem now is: Shall this committee, for the first time in 100 years of western water law, approve a formula which destroys an existing use, whether in New Mexico or Arizona or California, to make way for a new project? You have never done it." (pages 521 through 522, Senate Hearings on S.1658, April 21, 1964).

Congressman Saylor later made the same argument—that subordinating CAP to California's 4.4 maf controverts the Supreme Court Decree in *Arizona* v. *California* (see pages 252 and 253, 311, and 1011, Serial No. 17, House Hearings, August 25, 1965).

H. Amendment of S.1658

On July 27, 1964, Senator Hayden agreed to amend S.1658 (Arizona's bill) to authorize a "Lower Colorado River Basin Project" including substantially the same project authorization as in S.2760, as sponsored by Senator Kuchel, but limiting the protection of California's prior rights (up to 4.4 maf) to a period of 25 years from the date of enactment and limiting the Secretary's studies of water supplies and requirements to those of

the Lower Colorado River Basin (see page 24, Annual Report 1963-1964, Colorado River Board of California). The 25-year priority had been proposed by Senator Moss of Utah and endorsed by Governor Brown. However, California's Attorney General Mosk and Senator Kuchel strongly opposed it.

On August 6, 1964, the Senate Committee on Interior and Insular Affairs, having rejected Senator Kuchel's bill, S.2760, reported S.1658 favorably, with the bill further amended to restrict investigations of sources of water for importation to the Colorado River Basin to sources in California.

H.1. S.3104

Thereafter, on August 11, 1964, Senators Kuchel and Salinger introduced S.3104, to authorize studies, investigations and reports on water resources and requirements of the Colorado River Basin and on alternate sources of supplemental supply, and to protect in perpetuity existing lower Colorado River uses against CAP. Companion House bills were also introduced by 23 California Congressmen. The bill was designed to enlist the support of the Upper Basin States.

No further action on legislation concerning CAP or PSWP was taken by the 88th Congress which adjourned on October 3, 1964. However, the House Irrigation and Reclamation Subcommittee held hearings in Phoenix, Arizona, on November 9-10, 1964, but all pending legislation was dead.

In a meeting on December 15, 1964, between California representatives and Secretary Udall to discuss a compromise with Arizona, it was suggested that the protection of California's 4.4 maf per year could be relinquished when works were constructed and in operation to deliver a minimum of 2.5 maf per year of water into the lower Colorado River from an outside source. The 2.5 maf is the total of the Mexican Treaty obligation of 1.5 maf and net river losses of 1.0 maf between Lee Ferry and the Mexican boundary; i.e., the portion of Lee Ferry flow not available for use in the Lower Basin. In addition, the need for augmentation of the river was emphasized (page 18, Colorado River Board of California, Annual Report 1964-1965).

H.2. S.294 and S.75

On January 6, 1965, in the first session of the 89th Congress, Senator Kuchel introduced S.294, which differed from S.2760 (88th Congress) in two important respects: it provided (1) conditional authorization of an importation project instead of the authorization of only a feasibility study; and (2) protection of existing uses; e.g., California's 4.4 maf, until completion of an importation project delivering at least 2.5 maf into the mainstream below Lee Ferry, instead of protection in perpetuity.

Also on January 6, 1965, Senators Hayden and Fannin of Arizona introduced S.75. This retained the California priority of 4.4 maf for 25 years, but differed frm their prior bill S.1658, in that it authorized the Secretary to investigate all alternative sources of water for meeting requirements in the Lower Basin rather than being restricted to alternative sources in California. This was a regional plan but without PSWP's more controversial provisions. It included a Lower Colorado River Basin Development Fund, directed the Secretary to investigate augmentation, would authorize Bridge Canyon and Marble Canyon Dams, provided for water exchanges outside the CAP service area, proposed a Colorado-Pacific Water Commission, and would authorize the Southern Nevada Water Project.

H.3. S.1019 and H.R.4671

On January 18, 1965, Secretary Udall proposed that California and Arizona merge California's S.294 and Arizona's S.75 into one bill. This was done and the compromise agreement resulted in S.1019 being introduced in the Senate by Senator Kuchel on February 8, 1965, and H.R.4671, introduced in the House by the three Arizona Congressmen and 35 California representatives. On February 1, 1965, although the Arizona Senators did not sponsor the bill, Senator Hayden accepted Senator Kuchel's provision for a California priority of 4.4 maf over CAP on the condition that the House of Representatives must first pass the bill. This condition was prompted by prior actions where the Senate had passed CAP legislation, but the House had not. It was the initial joinder by the two States in a single approach to the CAP efforts.

In essence S.1019 and the companion House bills would provide:

(1) *Investigation of importation projects.* Instead of the conditional authorization of construction of the initial stage of importation works, the Secretary of the Interior would be authorized to investigate sources of water and to plan projects for the importation of at least 2.5 million acre-feet annually into the mainstream of Colorado River below Lee Ferry, and to report thereon to Congress within 3 years.

(2) *Protection for existing users.* Existing mainstream users in Arizona, California and Nevada would be protected against shortages in the basic supply for consumptive use of 7.5 million acre-feet a year as against the Central Arizona Project, although California's protection would be limited to 4.4 million acre-feet per annum of consumptive use. The protection would cease when works were completed to permanently deliver at least 2.5 million acre-feet a year into the mainstream below Lee Ferry from outside sources which the President proclaimed could supply this quantity without adverse effect on the satisfaction of the foreseeable water requirements of the areas of origin. The quantity of imported water needed to bring the consumptive use from the mainstream in the Lower Basin up to the 7.5 million acre-feet a year would be made available at Colorado River prices. If importations made more than 7.5 million acre-feet per annum available for consumptive use in the three States, the excess would be apportioned as under the Supreme Court Decree in *Arizona* v. *California*, one-half to California and the other half to Arizona and Nevada.

(3) *Authorized units.* The Secretary would be authorized to construct the Central Arizona, Bridge Canyon and Marble Canyon Projects.

(4) *Protection of areas of origin.* The Secretary would be directed to provide for adequate and equitable protection of the interests of the States and areas from which water would be exported to the Colorado River, including assistance from the development fund to be established by the Act, so that ultimate water requirements of the areas of origin could be satisfied at prices to users not adversely affected by the exportation.

(5) *Regional Development Fund.* There would be deposited into the fund all authorized appropriations and all project revenues, including the power revenues from the Bridge Canyon and Marble Canyon Projects and from the Hoover, Davis and Parker Projects after these latter have paid out. The fund would be applied to repayment of the cost of the entire project including the cost of importation works when subsequently authorized (pages 19 and 20, Colorado River Board of California Annual Report 1964-1965; pages 47 and 48, Seventeenth Annual Report of the Upper Colorado River Commission, September 30, 1965).

H.4. Comparison of Prior Legislative Proposals

A tabular analysis of the foregoing bills, dated March 4, 1965, was prepared by the Attorney General of California. It shows the comparison of the foregoing legislative proposals for the Lower Colorado River Basin (page 22, Annual Report 1964-1965, Colorado River Board of California).

H.5. Administration's Views

In a report of May 10, 1965, on S.1019 and S.75, the Bureau of the Budget stated it had no objection to the authorization of CAP except that Bridge Canyon Dam be deferred pending further study. Commissioner Dominy noted that Bridge Canyon, with over 5 billion kilowatthours annually, "...as far as power production, is the giant of all the potential on the River..."; that for comparison purposes Glen Canyon produces 3,820 million kilowatthours of energy annually; Marble Canyon, 2,200 million; Hoover, 3.5 billion; Davis, 976 million; and Parker, 472 million (page 165, Serial No. 17, August 25, 1965). Thus, the Administration gave its support to the pending legislation.

On May 17, 1965, Interior gave impetus to the Bureau of the Budget report and recommended enactment of H.R.4671 or one of its counterparts which have the same major objectives as PSWP (see page 9, Serial No. 17, August 23, 1965). Secretary Udall advised that deferral of Bridge Canyon Dam would affect only the

magnitude of surplus revenues in the development fund and not adversely affect the financial feasibility of the authorized projects. In his testimony, Secretary Udall stated that the objectives were:

(1) Studies on how and where to get the much needed water.

(2) A Lower Basin Development Fund to assist in meeting the cost of water development.

(3) Authorization now of needed Lower Basin works; e.g., CAP, Marble Canyon, water salvage, and recreation, fish and wildlife facilities, although Interior agreed on the deferral of Bridge Canyon Dam.

The basic problems to be resolved included:

(1) The Mexican Treaty burden as a national responsibility.

(2) Protection of areas affected by the import of 2.5 maf of water to the Colorado River system.

(3) Provision for future water needs of both Upper and Lower Basins (pages 103 through 105, Serial No. 17, August 23, 1965).

H.6. Basin States Consensus

During July and August 1965, numerous meetings were held among representatives of the seven Colorado River Basin States to discuss the proposed legislation and to attempt to resolve some of the remaining issues, particularly those between the Upper and Lower Basins; e.g., New Mexico's request for more water, questions as to the availability of water, the need for augmentation, and Colorado's former U.S. Senator Johnson's proposal that the Upper Basin sue the Lower Basin over apportionment of water between the two Basins and the different interpretations of "surplus" waters as used in the Compact. On August 20, 1965, representatives of the seven States reached a "consensus" on general principles relating to the respective rights, obligations and requirements of each Basin. These were testified to by Congressman Udall on August 23, 1965 (pages 48 and 49, 302 through 304, Serial No. 17, August 23, 1965):

(1) The Upper Basin's right to the use of water of the Colorado River, pursuant to the Colorado River Compact, shall not be jeopardized by the temporary use of unused Upper Basin water by any Lower Basin projects.

(2) The importation of substantial quantities of water into the Colorado River Basin is essential to the adequate development of both the Upper and Lower Colorado River Basins. It is recognized that this importation must be accomplished under terms which are fair to the areas of origin of the water so imported.

The pending legislation should authorize the Secretary to construct importation works which will deliver not less than 2,500,000 acre-feet annually, upon the President's approval of the Secretary's finding of feasibility.

(3) Such importation works should be planned and built so as to make the imported water available, if possible, not later than 1980. Water supply prospects on the Colorado River, based in part upon the temporary use of water allocated to the Upper Basin, appear adequate to furnish a full supply to the Central Arizona Project accompanied by the safeguards for existing projects agreed to by Arizona and California, until sometime during the last decade of the present century. Thereafter, the Central Arizona Project supply would diminish unless supplemented by importation.

(4) Satisfaction of the Mexican Treaty burden should be the first priority to be served by the imported water. The costs of importation allocable to the satisfaction of that burden, which is a national obligation, should be nonreimbursable.

H.6.1 House Subcommittee Hearings

The House Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs met on August 23-27, 30, 31, and September 1, 1965, to consider H.R.4671 and the bills similar to it. (The hearings are published as and identified herein as Serial No. 17 and Serial No. 89-17.) This bill was designated "Lower Colorado River Basin Project Act" although its stated objective included the provision of additional water supplies for use in the Upper as well as the Lower Colorado River Basins (page 1, Serial No. 17).

In addition to the foregoing it would authorize the Secretary to prepare estimates of the long range water supply available for consumptive use in the Upper and Lower Basins; to investigate alternative sources including desalination, weather modification, water renovation and reduction in losses to meet current and anticipated water requirements and in planning works to import water from outside the natural drainage area of the Colorado River system; and water salvage and ground-water recovery programs would be authorized.

In the hearings, the Secretary of the Interior commented (perhaps a little prematurely) that 1965 will be regarded as a historic turning point, the year the Arizona-California water feud ended and cooperation began, when the 11 governors of the West began common planning on water problems on a West-wide basis (pages 102 and 103, Serial No. 17).

The need for augmentation was seen by Reclamation's water supply analysis, that while CAP would have 1.2 maf available for the first 15 years of its operation, the water supply for CAP would progressively decrease as the Upper Basin's depletions increased. At the end of the payout period, the average water supply available for CAP would be about 580,000 acre-feet. The Upper Basin's water supply figures provided by the Tipton-Kalmbach report were less reassuring.

Secretary Udall stated there were three important possibilities for augmentation: (1) desalting; (2) Northern California water; and (3) the mouth of the Columbia River (pages 128, 135, 192 and 206, Serial No. 17). He also stated that CAP was economically feasible without importation (page 202, Serial No. 17).

Congressman Saylor noted the applications for construction of coal-fired powerplants which were expected to sell power at rates "...well below what the Bureau of Reclamation has included in its cost of water in these projects..." and suggested that Interior reexamine whether or not in the way of finding a bank account there might be some other methods of financing this matter (pages 218 through 221, and 226, Serial No. 17). This perhaps was the forerunner of the Navajo Generating Station.

Congressman Saylor further questioned why Arizona supported a bill which "...subverts the Colorado River Compact, the decision of the Supreme Court in the case of *Arizona* v. *California* and, in a sense, guarantees to the State of California 4 million 400 thousand acre-feet of mainstream water regardless of what happens..." (see pages 252 through 255, and 311, Serial No. 17). Congressman Udall replied that while Arizona had established legal rights through the Supreme Court action, it wanted water and would accept this method to obtain the long sought authorization for CAP; and that California would be giving up 700,000 acre-feet of water it was now using over its 4.4 maf priority and that its priority was limited to 4.4 maf.

H.6.2 Upper Basin Views

During the hearings, the Upper Basin States supported authorization of CAP but only under the following principal conditions as stated by Colorado which would protect the Upper Basin:

(1) Diversions from the mainstream below Lee Ferry shall be limited when necessary so as not to prejudice development of Upper Basin projects which will be required for the annual consumptive use of 7.5 maf after delivery of 75 maf at Lee Ferry in any period of 10 consecutive years.

(2) Concurrently with any authorization of the Lower Colorado River Basin project, there also be authorized the importation of water from sources outside the natural drainage area of the Colorado River system in quantities to meet: (a) Mexican Treaty obligations as a National responsibility; (b) supply the Lower Basin States with that amount of water required for the consumptive use of 7.5 maf; and (c) supply the Upper Basin States with that amount of water for the consumptive use of 7.5 maf. (It was Arizona's view that this condition could only delay any bill since the source of a new water supply was so controversial.)

(3) That the primary purpose of the Colorado River Storage Project is to implement beneficial consumptive use of water in the Upper Basin and that Glen Canyon Reservoir will not be drawn below its rated head, except as may be necessary to comply with Article III(d) of the Compact; i.e., to deliver 75 maf in any 10-year consecutive period.

(4) That the diversion of money from the Upper Colorado River Basin Fund as payment for the so-called Hoover Dam deficiencies, pursuant to the Glen Canyon Filling Criteria, be terminated forthwith and reimbursement be made in full (see pages 338 through 345, Serial No. 17; pages 48 through 52, Seventeenth Annual Report of the Upper Colorado River Commission, September 30, 1965).

Wyoming endorsed the position of Colorado (see pages 363 through 365, Serial No. 17; pages 21 and 22, Nineteenth Annual Report of the Arizona Interstate Stream Commission, July 1, 1965, to June 30, 1966).

New Mexico also favored authorization of CAP but as a condition of its approval sought an additional 46,000 acre-feet of water from the Gila River system and an agreement therefor with Arizona and the United States in the event the Supreme Court Decree in *Arizona* v. *California* required amendment (see pages 376 through 387, Serial No. 17). This condition was likened to holding CAP for ransom, although Hooker Dam on the Gila River in New Mexico was already programed.

Utah favored CAP but only if its water needs would not prejudice the Upper Basin's compact apportionment of water and agreed with the points advocated by Colorado. Also, as a part of the regional program, the Dixie Project in Utah was made a part of the Lower Basin project as a participant in the new Lower Basin Fund (see page 415, Serial No. 17).

H.6.3. Northwest States Views

Idaho noted that H.R.4761 fails to list the source of augmentation and, like Oregon, would require the area seeking importation to prove the highest feasible use of water in their areas (see pages 427 through 428, Serial No. 17). Idaho feared that diversions from the Snake River would be attempted (page 701, Serial No. 17). The National Parks Association was opposed to the Bridge Canyon Project on the basis that alternative thermal power was as cheap (see pages 716 through 736, 742, Serial No. 17).

Oregon first wanted a demonstration of more efficient use of water before any importation would be authorized; that the source of import be identified and the exporting area represented by those considering the problem; that a National water commission study the Nation's water problems rather than a limited regional study; that the import of water from Canada be studied; and that it had appropriated $332,000 to study Oregon's water needs which needed completion (see pages 407 through 413, Serial No. 17).

The State of Washington would give consideration to export of water only if a surplus was assured and wanted a study made of its own State's water needs as well as the Lower Basin resources (see pages 434 through 439, Serial No. 17).

The foregoing led Arizona to comment that its initial proposal for a single CAP project was now tied to solutions of Nation-wide water problems (see page 442, Serial No. 17).

The Upper Colorado River Commission agreed as to the need for augmentation of the Colorado River water supply and for the ability to recall Upper Basin water that will be available temporarily for CAP. It cited the Tipton and Kalmback, Inc., report as to shortages in the Basin about 1990-2000. The Commission urged that the quantity imported should not be less than 3.4 maf in order to satisfy the Mexican Treaty obligation of 1.5 maf plus losses of 1.0 maf and the use of 7.5 maf in each Basin. It urged that the deficiency payments under the Filling Criteria be discontinued and that the Upper Basin Fund be reimbursed from the Colorado River Dam Fund for all payments made from the Upper Basin Fund (see pages 500 through 512, Serial No. 17).

Colorado had substantially the same position as the Upper Colorado River Commission (see pages 555 through 562, Serial No. 17).

H.6.4. Conservation Groups' Views

The conservation groups, such as the National Audubon Society and the Sierra Club, totalling 25 witnesses, did not oppose CAP but did object to both Bridge Canyon and Marble Canyon Dams, contending that the former was in conflict with the law establishing the Grand Canyon National Park and urged either steam or nuclear energy as a more economical alternative source of energy for pumping CAP water (see pages 751, 783, and 798, Serial No. 17). Reclamation denied this and noted the contribution from

the sale of power toward costs of needed augmentation. The Sierra Club's newspaper advertising in opposition to the dams led to an Internal Revenue Service audit and loss of its income tax exemption because of its efforts to influence legislation (see page 9, Twentieth Annual Report of the Arizona Interstate Stream Commission, July 1, 1966, to July 30, 1967).

H.6.5. Compromise Attempts

The hearings, therefore, concluded on September 1, 1966, with no unanimity among the Basin States but with differences on water supply, rate of Upper Basin development and depletion of water supply, and future net losses of water from the river in the Lower Basin, all of which affected the water supply for CAP. Furthermore, the opposition to Bridge Canyon and Marble Canyon Dams jeopardized the anticipated source of revenues from the proposed powerplants. Following the hearings held in August and September 1965, there were a series of meetings of representatives of Arizona, California, and Colorado to resolve differences on the legislation which was indicated during the hearings. There emerged therefrom Committee Print No. 19, agreed upon on September 20, 1965. The major provisions were as follows:

(1) Title 1 was changed from "Lower Colorado River Basin Project" to "Colorado River Basin Project" to indicate the benefit to the entire Basin.

(2) The Upper Basin's demand for concurrent authorization of a project to import additional water was dropped but investigations and planning therefor were authorized. The Secretary was to submit by the year 1970 the first draft of an importation plan for not less than 2.5 maf per year in satisfaction of the Mexican Treaty obligation as well as planning of facilities to include an additional 2 maf for the Lower Basin, 2 maf for the Upper Basin and 2 maf to be used in other States along the importation route, or a total of as much as 8.5 maf. The Mexican Treaty obligation would be a National obligation. Greater protection would be given to areas of origin by giving them priority of right in perpetuity.

(3) The capacity of the Central Arizona Aqueduct was modified by providing that the size be sufficient to divert annually 1.2 maf (which had nothing to do with the amount of water to which CAP may be entitled). This would be an increase in capacity from 1,800 ft^3/s to 2,500 ft^3/s. Any increased capacity above that will be paid for by funds other than those contributed to by California and Nevada.

(4) The Southern Nevada and Dixie Water Projects were integrated into the Colorado River Basin Project to permit participation in the development funds.

(5) Five Upper Basin projects were authorized at an estimated cost of $360 million. Other Upper Basin projects would be given priorities in planning studies.

(6) Bridge Canyon and Marble Canyon Dams would be authorized.

(7) The Colorado River Development Fund would reimburse the Upper Colorado River Basin Fund for expenditures therefrom for deficiencies in Hoover generation due to the filling of Colorado River Storage Project reservoirs.

(8) The Secretary would be required to promulgate equitable criteria for the coordinated long range operation of reservoirs on the river. Priorities for the storage and release of water were enumerated in the new committee print.

(9) The Upper Basin rights to Colorado River water would not be impaired by the temporary use of water in the Lower Basin.

(10) The Secretary would report on annual consumptive uses and losses of water from the Colorado River system at 5-year intervals and in the event of the Secretary's failure to comply with the "Law of the River" suit could be initiated by a State in the U.S. Supreme Court.

(11) The Colorado-Pacific Regional Water Commission would be expanded to include reepresentatives of all of the Basin States and each State from which it is proposed to import water and from Federal departments (see pages 963 through 974, and 1058 through 1061, Serial No. 89-17, Part II).

In order to resolve matters still in dispute, negotiating sessions were held among the seven Basin States in late 1965 and early 1966. Revised drafts of the bill were prepared on January 27, 1966, and February 8, 1966, which included Upper Basin projects. New Mexico still insisted on more Gila River water and the Upper Basin States wanted criteria included to prevent the drawdown of Lake Powell for power production at Hoover.

On February 19, 1966, representatives of the three Lower Basin States agreed to several proposed changes in the draft of February 8, 1966, concerning the sizing of the proposed Central Arizona Aqueduct and the pricing of imported water. The Upper Colorado River Commission on February 22, 1966, adopted a resolution endorsing the February 8, 1966, draft of H.R.4671 with the modifications agreed to by the Lower Basin conferees and urged that this draft as modified be submitted to the Interior and Insular Affairs Committee of the House of Representatives for consideration and enactment into law (pages 36 through 41, Eighteenth Annual Report of the Upper Colorado River Commission, September 30, 1966).

The California analysis of the changes appears at pages 1154 through 1165 of Serial No. 89-17, Part II.

Despite this so-called agreement, the Upper Basin had reservations as to supporting H.R.4671 without provision for an impact study which they deemed vital. The Northwest States were critical of the bill. In hearings in May 1966, Oregon cited the proposed increase of imported water from 2.5 maf to 8.5 maf annually and noted the further request of Texas for inclusion in the study of water needs. It rejected claims on Columbia River water for areas 1,500 miles away and was opposed to studies for water importation in a bill to authorize a reclamation project, urging the separation of these two matters. Washington, Oregon, and Idaho also urged deletion of the importation studies and cited the need for their own studies of water requirements (see pages 1125, 1134, and 1145, Serial No. 89-17, Part II). On the plus side for CAP was the compromise between Arizona and New Mexico.

Interior stated the Administration's support for the objectives of H.R.4671 but not all of its details. It would defer Bridge Canyon Dam pending further study and favored Marble Canyon Dam and the study of importation of water by the National Water Commission rather than by the Secretary. This position served to favor the Northwest States position and a setback to the Basin States. It had, however, found the operating criteria guidelines were reasonable and workable (see pages 1336 through 1339, Serial No. 89-17, Part II; see also page 1358 for Reclamation's analysis of the operating criteria provisions).

The hearings elicited Reclamation's statement that the operating criteria were not inconsistent with the filling criteria (pages 1344, and 1381, Serial No. 89-17, Part II); that steam generating plants as a source of CAP pumping was being considered (see pages 1365, 1367, and 1387, Serial No. 89-17, Part II); and that the excess land laws would apply to CAP (see page 1412, Serial No. 89-17, Part II).

Hearings on the expanded H.R.4671 were resumed before the Subcommittee on Irrigation and Reclamation on May 9, and concluded on May 18, 1966. Among the items testified to were water supply for CAP, Bridge Canyon Dam despite the Bureau of the Budget recommendation for its deferral, New Mexico's condition for increased Gila River water supplies, a request that Texas be included in an augmentation program which meant further demands on an export of water from the Northwest, the Administration's request for deferral of Bridge Canyon Dam and three of the five Upper Basin projects, and the substitution of nuclear plants for the two dams on the river. The bill under consideration, Committee Print No. 19, dated April 25, 1966, incorporated the changes agreed to by the seven Colorado River Basin States after the August 1965 hearings. Among the principal changes in H.R.4671 which were incorporated in the September 20, 1965, draft were:

(1) *Size of Central Arizona Project*

Central Arizona unit to be of such size as to provide for an average annual diversion not to exceed 1,200,000 acre-feet of Colorado River water. This would be an increase from 1,800 to 2,500 ft^3/s with project financing with the cost of any increase above 2,500 ft^3/s to be borne by Arizona.

(2) *Upper Basin Projects*

Number of projects that would be authorized or construction reduced from 14 to 5 (Animas-La Plata, Dolores, Dallas Creek, West Divide, San Miguel). Planning reports authorized for the nine other projects.

(3) *Operating Criteria*

These were expanded to provide priorities in the storage and release of water.

H.6.6. Subcommittee Approval of H.R. 4671

The House Subcommittee on June 27, 1966, reported to the full committee the proposed Colorado River Basin Project Bill, H.R.4671, as amended (Committee Print No. 24), by a vote of 13 to 5 with all five

California Congressmen on the Subcommittee in favor of the bill. It was the first House Subcommittee action favorable to CAP since the project bill was introduced 20 years earlier (page 95, Nineteenth Annual Report of the Arizona Interstate Stream Commission).

Major provisions of the bill as approved by the Subcommittee are as follows:

(1) *Investigations and Planning*

The Secretary of the Interior, in conformity with the principles, standards and procedures established by the National Water Resources Council, would be authorized to investigate sources of water to meet current and anticipated water requirements of the Southwest (Colorado River Basin plus portions of Kansas and Texas); to prepare reconnaissance reports on a staged plan to meet these requirements; and to prepare a feasibility report on the first stage of such plan. The first stage would provide importation of at least 2.5 million acre-feet annually into the mainstream of the Colorado River below Lee Ferry, and could include another 2 million acre-feet annually for use in the Lower Colorado River Basin, 2 million acre-feet annually for the Upper Basin, and 2 million acre-feet annually for use in areas enroute to the Colorado River system. (The increased scope and cost of the import program was considered by Arizona as a burden to passage of any CAP bill.)

(2) *Mexican Water Treaty*

Satisfaction of the requirements of the Mexican Water Treaty declared to be a National obligation.

(3) *Protection of Uses*

Existing mainstream users in Arizona, California and Nevada would be protected against shortages in the basic supply for consumptive use of 7.5 million acre-feet a year as against the Central Arizona Project, although California's protection would be limited to 4.4. million acre-feet per annum of consumptive use. The protection would cease when the President had proclaimed, among other things, that works had been completed and were in operation capable of delivering not less than 2.5 million acre-feet annually into the mainstream of the Colorado River below Lee Ferry from sources outside the drainage area of the Colorado River system. The quantity of imported water needed to bring the consumptive use from the mainstream in the Lower Basin up to the 7.5 million acre-feet a year would be made available at Colorado River prices.

(4) *Authorized Units*

Would authorize construction of the Central Arizona, Bridge Canyon and Marble Canyon units in the Lower Basin; and the Animas-La Plata, Dolores, Dallas Creek, West Divide, and San Miguel Federal reclamation projects in the Upper Basin. (This was contrary to the Administration's more limited position.)

(5) *Protection of Areas of Origin*

Would provide for adequate and equitable protection of the interests of the States and areas from which water would be exported to the Colorado River, including assistance from the development fund to be established by the Act, so that ultimate water requirements of the areas of origin could be satisfied at prices to users not adversely affected by the exportation. Would give areas of origin priority of right in perpetuity to the use of water as against the users supplied by the exportation works. This was a broader protective provision than previously advanced.

(6) *Lower Colorado River Basin Development Fund*

Would establish a fund into which would be deposited all appropriations and all project revenues including the power revenues from the Bridge Canyon and Marble Canyon Projects and from the Hoover, Davis and Parker Projects after these latter have paid out. The fund would be applied to repayment of the cost of the entire project including the cost of importation works.

(7) *Reimbursement of Upper Colorado River Basin Fund*

The Upper Colorado River Basin Fund would be reimbursed from the Colorado River Development Fund (established by the Boulder Canyon Project Adjustment Act) for all expenditures made or to be made from the former fund to meet deficiencies in power generation at Hoover Dam during the filling period of storage units of the Colorado River Storage Project.

(8) *Criteria for Long-Range Operation of Reservoirs*

The Secretary would promulgate equitable criteria for coordinated long-range operation of Colorado River Storage Project reservoirs and Lower Basin mainstream reservoirs, to follow specified orders of priority for storage in and releases from Lake Powell.

(9) *Lower Basin Water Use Not Prejudicial to Upper Basin*

Rights of the Upper Basin to consumptive use of water apportioned to that Basin by the Colorado River Compact would not be prejudiced or reduced by any use thereof in the Lower Basin (pages 12 through 14, Colorado River Board of California, Annual Report, 1965-1966).

H.6.7. Criteria for Long Range Operation of Reservoirs

Section 601 of H.R.4671, as approved by the Subcommittee on Irrigation and Reclamation on June 27, 1966, would direct the Secretary of the Interior to establish equitable criteria for the coordinated long-range operation of the reservoirs constructed pursuant to the Boulder Canyon Project Act, the Colorado River Storage Act, and H.R.4671. These criteria would be prepared and reviewed annually in consultation with representatives of the seven Colorado River Basin States and would be consistent with the Law of the River.

The language was developed in a series of inter-Basin negotiations. Its inclusion was deemed essential by Upper Basin spokesmen who were concerned that the operation of the reservoirs could be detrimental to Upper Basin interests because of (1) lack of specific operating procedures in the filling criteria for Lake Powell, promulgated by the Secretary of the Interior on April 14, 1962, and (2) lack of official interpretation of certain provisions of the Colorado River Compact, particularly Article III, paragraphs (c), (d) and (e). These provisions require: III(c) that obligations to Mexico be met first out of surplus and then by sharing of the burden of any deficiencies equally between the Upper and Lower Basins; III(d) that the States of the Upper Division shall not cause the flow of the river at Lee Ferry to be depleted below 75 million acre-feet in any consecutive 10-year period; and III(e) that the States of the Upper Division shall not withhold water and the States of the Lower Division shall not require the delivery of water which cannot reasonably be applied to domestic and agricultural uses.

The objective of Section 601 of H.R.4671 was to avoid uncertainties caused by varying interpretations of the Compact and to provide for a sharing between Basins of the benefits of wet years and the burden of drawdowns during droughts.

California stated that its studies showed that operation of Lake Powell under a rigid rule curve as originally proposed by the Upper Basin, based upon the Lee Ferry delivery obligation of Article III(d) and the advent in any point in time of the most critical drought in history would not only (1) require the maintenance of progressively larger quantities of holdover storage in Lake Powell at the expense of storage in Lake Mead, as Upper Basin depletions increase, but would also (2) limit the regulatory capability of Lake Powell and possibly (3) result in excessive spills from Lake Powell and thereby a loss of power production.

Lower Basin States representatives urged the use of a probability approach as being more equitable for determining the amount of storage to be retained in the Upper Basin reservoirs at any time. On the basis of the 1896-1965 average water supply, there would be better than a 25 percent chance that the major reservoirs on the river will be full by the end of 1975 and that on the basis of the 1922-1965 average, there would be a 10 percent chance that the reservoirs will be full by that time. The year 1975 was considered significant since it was projected that the Central Arizona Project would put a large new demand on the river then.

As a result of the studies and negotiations, Section 601 of the bill approved by the House committee contained a list of priorities to govern the storage of water in storage units of the Colorado River Storage Project and releases of water from Lake Powell. The priorities are (1) releases in accordance with Article III(c) of the Compact, (2) releases in accordance with Article III(d), and (3) accumulation of storage in the Upper Basin and releases to meet uses specified in Article III(e). Compromise language was agreed upon in Section 601(b)(3) which would direct the Secretary, in determining the quantity of storage in Lake Powell "reasonably necessary" pursuant to the Compact, to consider "all relevant factors (including, but not limited to, historic streamflows, the most critical period of record and *probabilities of water supply*)." (Emphasis supplied.) (See pages 29 and 30, Colorado River Board of California, Annual Report 1965-1966.)

H.6.8 Amendment of H.R.4671

On July 5, 1966, during the National Governors Conference, a letter signed by each of the Governors of the seven Basin States was forwarded to the President urging active support of the Colorado River Basin Project by the Administration.

The House Interior and Insular Affairs Committee amended H.R.4671 on July 21, 1966, by rewriting the provisions of Title II pertaining to augmentation of the river. In part, this amendment was objectionable to California and others because it weakened the augmentation study provisions by placing the investigation of the Colorado River Basin water shortages and means of augmentation of the Colorado River in the hands of a newly created National Water Commission, rather than by the Secretary; and the end product was to be a reconnaissance report, instead of a feasibility report, necessitating a second act of Congress to authorize a feasibility investigation and report. This was designed to reduce opposition from the Northwest States but it threatened the unity in the seven Basin States and antagonized California.

There followed negotiations among the representatives of the Colorado River Basin States which resulted in the substitution of Title II amendment which was satisfactory to and could be supported by California and most of the Basin States. This would permit the National Water Commission to make a preliminary study of inter-Basin diversion possibilities and to continue on a feasibility study if warranted. The new amendment was approved on July 28 and the full House Interior Committee reported H.R.4671, as amended, by a vote of 22 to 10. All the California members of the Committee as well as all the Colorado River Basin Congressmen voted in support of the bill. It was the first time CAP had cleared the full House Committee on Interior and Insular Affairs (page 12, Arizona Interstate Stream Commission, Twentieth Annual Report, July 1, 1966, to June 30, 1967).

Opposition to H.R.4671

On August 19, 1966, Governor Hansen of Wyoming advised the President of withdrawal of Wyoming's support of H.R.4671 on the grounds that the amendments by the House Interior and Insular Affairs Committee pertaining to augmentation had eroded the fundamental principles deemed to be essential by the State of Wyoming. The Navajo Indians Tribal Council opposed both dams and advocated use of their coal deposits for pumping power. Conversely, the Central Arizona Indians favored the dams.

Of growing concern was the possibility that when the bill reached the floor of the House there would be an effort to introduce substitute amendments which would eliminate the regional aspects of the bill in favor of essentially a Central Arizona Project authorization.

By the close of September 1966, it was apparent that the Rules Committee would not grant a rule on H.R.4671 and that the bill was dead. Congressman Wayne N. Aspinall, Chairman of the House Interior and Insular Affairs Committee, and others did not support the granting of a rule because passage would not be assured due to the following reasons:

(1) Lack of support by the Administration for the bill as approved by the House Interior Committee;
(2) Opposition of the "Preservation" groups to the power dams proposed on the river;
(3) Opposition of the Pacific Northwest to the regional study proposals;
(4) Evidence of weakening of the seven-State unit; and
(5) Opposition of the economy bloc in the House in view of the high cost of the proposed projects.

In addition, one of the dangers of bringing the bill to the floor of the House was the possibility that a substitute bill by Congressman Saylor would have been adopted. This bill would have eliminated the major features desired by California and the Upper Basin States; i.e., augmentation, no priority for California, and the two hydroelectric dams. Thus, H.R.4671 was aborted with the end of the 89th Congress. No Senate hearings were held in 1966 (pages 41 through 46, Eighteenth Annual Report of the Upper Colorado River Commission, September 30, 1966).

H.7. Arizona's Go-it-Alone Plan

A special meeting of representatives of the seven Colorado River Basin States was held in Albuquerque, New Mexico, on November 16, 1966, to consider whether legislation for a Colorado River Basin Project proposed to be introduced in the 90th Congress might have the support of all the States. Arizona stated that all commitments and guarantees made by Arizona and included in H.R.4671 were considered to be null and void as of the date of adjournment of the 89th Congress. It further stated that Arizona would make a full scale effort for a Federal reclamation project in the 90th Congress and would accelerate its own (go-it-alone) program for a Central Arizona Project without Federal help so as to utilize Arizona's share of Colorado River water at the earliest possible date and that Arizona should pursue its efforts to obtain an FPC license to build Marble Canyon Dam. Nonetheless, Congressman Udall of Arizona expressed the view that Federal legislation was the best approach for a solution of Arizona's problems and that there was a continued need for seven-State cooperation (pages 12 through 14, Colorado River Board of California, Annual Report 1966-1967). Arizona's Interstate Stream Commission and Power Authority studied feasibility of a State financed CAP. This led to enactment in March 1967 of a State Water and Power Plan for CAP. Thus, Arizona proceeded on a dual path of Federally financed construction of CAP and a State financed project.

H.8. 90th Congress - 1967

Following the opening of the 90th Congress in January 1967, twenty-six bills were introduced with respect to a Colorado River Basin Project. These included: H.R.30, a regional bill by Congressman Aspinall—subsequently reintroduced as H.R.3300 (this called for Bridge Canyon Dam but not Marble Canyon Dam, a 4.4 maf guaranty for California, a diversion study, and five Colorado projects); an identical bill, H.R.744, by Congressman Johnson of California; H.R.9 by Congressman Udall—a Central Arizona Project bill (this called for Bridge Canyon Dam but not Marble Canyon Dam, no 4.4 maf guaranty for California, and no water importation studies); and H.R.722 by Congressman Hosmer—identical to H.R.4671 as reported by the House Interior Committee the previous year (see page 2, House Subcommittee Hearings, Serial No. 90-5).

On January 31, 1967, Senator Kuchel advised that after consultation with Chairman Aspinall and Subcommittee Chairman Johnson of the House Interior Committee and others, the Senator proposed to introduce legislation which would retain the basic principles of H.R.4671 of the 89th Congress but would eliminate Marble Canyon Dam, reduce the size of the proposed Central Arizona Aqueduct and make certain other minor clarifying changes.

Senator Kuchel's bill, cosponsored by Senator Moss of Utah, was introduced on March 3, 1967, as S.861.

Senator Jackson also introduced S.20 which would have established a National Water Commission. The purpose was to prevent any importation study of water from the Northwest by Interior which was part of the regional water program for the Colorado River Basin. S.20 passed by the Senate and became part of Title II of H.R.3300.

H.8.1. Interior's More Limited Plan

On February 1, 1967, the Secretary of the Interior announced a revised development program for the lower Colorado River which, in part, would provide for a Central Arizona Project; expansion of the boundaries of Grand Canyon National Park to include the Marble Canyon Dam site; deferment of any action on Hualapai Dam site; substitution for hydroelectric power from either Bridge Canyon or Marble Canyon Dams of power capacity to be purchased in thermal electric generating plants for the pumping power needs of the Central Arizona Project; and establishment of a National Water Commission to study water supply problems on a National scale. The latter was an effort to eliminate opposition from the Northwest States, though it was not favored by either California or the Upper Basin States. The Administration also left the 4.4 maf guaranty for California up to Congress. Nor was there a provision for a study of water importation from the Northwest (pages 40 through 41, Twentieth Annual Report of the Arizona Interstate Stream Commission, July 1, 1966, to June 30, 1977). This proposal by the Administration was attacked by

California as a reversal from previous recommendations of the Secretary of the Interior for a regional concept of planning to meet the Colorado River Basin needs and by the Upper Basin for dropping a water augmentation program (pages 42 and 43, id.).

H.8.2. S.1004

Two more bills were introduced in the Senate with respect to Colorado River legislation. On February 16, 1967, Senator Hayden and cosponsors Senators Fannin and Jackson, introduced S.1004 to authorize only the Central Arizona Project. This did not include California's priority of 4.4 maf or water import studies, omitted Bridge Canyon and Marble Canyon Dams and authorized CAP pumping power from a thermal plant built by non-Federal entities. It also omitted any Upper Basin projects. The following day, S.1013, the Administration bill, was introduced by Senator Jackson. This omitted three key features deemed essential by California. These were protection of existing uses of water, augmentation of the Colorado River, and construction of Hualapai Dam.

Three days before hearings were held by the House Subcommittee on March 13-17, 1967, on these bills, the Arizona Legislature authorized development of a State go-it-alone plan for CAP. This included construction of Bridge Canyon and Marble Canyon Dams whose revenues would retire the bonds to pay the costs of the project. Governor Williams signed the bill on March 14, 1967.

Testimony during the Congressional hearings was basically limited to such pertinent information as had not been covered the previous year during the hearings on H.R.4671. On March 17, 1967, the Department of Water and Power of the City of Los Angeles recommended construction of Hualapai Dam and Powerplant with an increase in generating capacity from the 1,500,000 kW originally proposed to 5 million kW as a combined hydro-pumped storage peaking plant. This would provide pumping power for CAP and peaking capacity for participating utilities. This unexpected proposal appeared to be a threat to the sale of power by the Northwest.

California opposed the Hayden bill because it lacked California's 4.4 maf priority over CAP and opposed the Administration's bill because it omitted augmentation. Colorado opposed the Hayden bill because it omitted Colorado's projects. Wyoming supported CAP but only if the Colorado River was augmented with water from northern California.

During the period May 2-5, 1967, hearings were held by the Senate Interior Subcommittee on Water and Power Resources on proposed Colorado River Basin legislation (S.1013, S.1004 and S.861).

Arizona's Senator Hayden (for the fourth time before this Subcomittee) reviewed Arizona's efforts to obtain CAP and to further reclamation projects in other States. He defended Arizona's unwillingness to guarantee California's 4.4 maf priority in perpetuity as placing on Arizona and the other so-called inland States the entire burden of augmenting the water supply of the Colorado River in preparation of times shortage. To do so, he said, would reverse the Supreme Court Opinion. He also noted that California could look to the Colorado River, northern California and the Pacific Ocean, while Arizona's only water source was the Colorado River.

The issue, over simplified, was between a bare bones CAP, sponsored by Arizona, Washington and Nevada, and a regional approach with hydroelectric dams and inter-Basin studies favored by California and the Upper Basin States.

The Administration supported authorization of CAP, water studies by a National Water Commission, deletion of three of five Colorado projects, elimination of Bridge Canyon Dam and deferral of Marble Canyon Dam, and the purchase of generating capacity in a coal-fired plant to be constructed by private and public power companies near Page, Arizona, adjacent to Lake Powell, in lieu of the hydroelectric dams as a means of minimizing controversy. Southern California Edison Company, Salt River Project, and Arizona Public Service Company had indicated their interest in the proposal. It was Secretary Udall's position that California's 4.4 maf priority was a matter for the States to decide.

The Sierra Club opposed both dams and urged that the entire Grand Canyon area be placed within the National Park System. It also favored the Administration's proposal of prepayment for power to be generated by a thermal plant as "an imaginative approach."

New Mexico sided with Arizona while demanding an increase of 18,000 acre-feet of consumptive use from the Gila River, but increasing to 48,000 acre-feet when the Colorado River has been augmented.

As a consequence of the Senate Interior Subcommittee hearings, there followed a series of conferences with Upper Basin representatives in an attempt to reconcile various positions and reach compromise agreements before the Senate and House committee's markup of the respective bills. Senator Hayden agreed to amendments to include a 27-year priority for California's 4.4 maf to gain California support and authorization of five Upper Basin projects and assistance to the Dixie Project in Utah to gain Upper Basin support.

H.8.3. Senate Approval of S.1004

On June 29, 1967, the Senate Interior and Insular Affairs Committee approved S.1004, primarily a Central Arizona Project authorization bill, with the above modifications. Senator Kuchel of California with Colorado and Wyoming prepared minority views to accompany the Interior Committee's Senate Report 408, together with minority and individual views.

Following floor debate which culminated on August 7, 1967, the Senate by voice vote approved S.1004.

This bill was unacceptable to California for several reasons:

(1) It provided protection of California's 4.4 maf per year for only 27 years.

(2) It contained no provision for commencement of water augmentation studies, which prompted criticism from Colorado, Wyoming and Utah, but drew support from Senator Jackson of Washington.

(3) It did not provide for construction of Hualapai Dam.

(4) It earmarked Hoover and Parker-Davis power revenues to help contribute to payoff of the Central Arizona Project with higher rates for Southern California and Nevada power users.

The CAP bill did, however, provide:

(1) Authorization of a $786 million CAP.

(2) Construction of a prepaid thermal plant, to supply CAP pumping power.

(3) A 4.4 maf priority to California for the 27 years remaining before payoff of the MWD Aqueduct.

(4) Hoover and Parker-Davis power revenues after payout are to be deposited in the Lower Basin Development Fund to help pay for augmentation. Arizona's contribution to those revenues would be used to help repay the costs of CAP until that Project has also been paid off, after which time Arizona's share of surplus power revenues from Hoover and Parker-Davis and surplus revenues from the CAP will be used to help pay the costs of augmentation.

(5) Protection of existing Colorado River water uses in Arizona.

(6) The Dixie Project for Utah and five projects for Colorado.

H.8.4. House Delay on CAP Legislation - Power Politics

Chairman Aspinall of the House Committee on Interior and Insular Affairs was critical of the Senate action in failing to provide for augmentation and on August 17, 1967, stated that his committee would take no action on the legislation in the first session of the 90th Congress. This rekindled Arizona's go-it-alone plan since it could kill CAP.

In an effort to force House action, Senator Hayden, on September 21, 1967, sought to defer an $11.5 million appropriation for the Fryingpan-Arkansas Project in Colorado. And, on September 28, 1967, Senator Hayden announced a move to amend the House Public Works Appropriations measure by adding to it as a rider the text of the Central Arizona Project bill, S.1004, as passed by the Senate, and, in effect, to circumvent the House Interior Committee and Chairman Aspinall's refusal to act. Senator Hayden withdrew his motion after assurances that the House Interior Committee would consider the Colorado River Basin Project legislation early in the second session of the 90th Congress (pages 41 through 75, Nineteenth Annual Report of the Upper Colorado River Commission, September 30, 1967).

Because of the major differences between the Senate legislation, S.1004 in the Senate and H.R.3300 pending in the House, many suggestions were made by the interested parties as to possible shifts in policy

and lines of cooperative action which would perhaps achieve the desired results without sacrifice of basic regional principles. Arizona was proceeding on its go-it-alone plan which, if successful, was viewed as the end of Federally financed projects, and Governor Reagan of California wanted to meet with Governor Williams of Arizona.

H.8.5 H.R.3300 - S.1004

Looking toward early consideration of Colorado River Basin Project legislation by the House Interior Committee in the second session of the 90th Congress in 1968, a draft of revision of H.R.3300 was prepared by the State of Colorado for consideration during a meeting of the seven Colorado River Basin States in Las Vegas, Nevada, on December 7, 1967. A principal change was a priority of 4.4 maf for California until such time as the President found that the Mexican Treaty requirements had been met by augmentation, but that augmentation would require the express permission of the States involved (pages 21 through 28, Twenty-first Annual Report, Arizona Interstate Stream Commission, July 1, 1967, to June 30, 1968). Following the seven-State meeting, a new revision to Colorado's draft of H.R.3300 was developed (pages 12 through 19, Colorado River Board of California, Annual Report 1966-1967).

Identical bills to authorize a Colorado River Basin Project were introduced by California Congressmen in the House on January 25, 1968 (H.R.14834, Johnson and 22 cosponsors; H.R.14835, Hosmer and seven cosponsors), on January 31, 1968 (H.R.14994, Sisk and two cosponsors) and on February 27, 1968 (H.R.15615, Talcott).

The California bills contained areas of compromise and was viewed as a most encouraging development for CAP. H.R.14834 (Johnson) contained the language giving existing water contractors a priority over CAP. The bill also eliminated Hualapai Dam which was a California concession; reduced the target quantity for "augmentation" to 1.3 million acre-feet; defined "augmentation" as the introduction of new water into the river; fixed the size of the Central Arizona Aqueduct of 2,500 cubic feet per second; and limited the subsidy to the Central Arizona Project from Hoover, Parker, and Davis revenues, after payout of those projects, to the portion of those revenues paid by Arizona, the balance to be reserved to help repay the cost of future works to augment the Colorado River.

H.8.6 House Approval of H.R.3300 and S.1004

Congressman Johnson presided at the hearings on H.R.3300 and S.1004 during January 30-February 2, 1968. Testimony was presented only by the Department of the Interior witnesses and dealt with Interior's answers to questions posed by Congressman Aspinall; e.g., the adequacy of the water supply for CAP, rate of Upper Basin development, inclusion of Upper Basin projects, the substitution for Bridge Canyon and Marble Canyon hydroelectric power of power from a coal-fired plant, the problems involved in Arizona's "go-it-alone" policy, and the Peabody Coal Company contract with the Navajo and Hopi Indians for the mining of coal from the Indian Reservations for a thermal plant.

On March 1, 1968, the Subcommittee completed its markup of H.R.3300 and reported the bill to the full Interior and Insular Affairs Committee. Congressman Saylor's bill authorizing CAP and only two Colorado projects was rejected 18-5.

The approved bill was Congressman Aspinall's compromise version of the CAP legislation. Its salient features included:

(1) Authorization of CAP at a cost of $779 million plus up to $100 million for distribution systems.

(2) Authorization of five Colorado projects at $398 million.

(3) A 4.4 maf guaranty to California until the river was augmented sufficiently to meet the Mexican Treaty demand. This was a major compromise.

(4) Transfer of the Treaty burden to the Nation as a whole. This minimized the California priority issue.

(5) Creation of two Lower Basin funds.

(6) $100 million prepayment of a thermal plant to be built by private utilities to generate power for CAP; i.e., no hydroelectric dams.

(7) Conditional authorization of the Uintah Project in Utah and reauthorization of Utah's Dixie Project at a cost increase from $42.7 to $58 million.

(8) Authorizaiton of Interior's studies to augment the Colorado River.

On March 26, 1968, H.R.3300, as amended, was reported by the full House Interior and Insular Affairs Committee by a vote of 22 to 10 with one absention. Congressman Saylor had offered 29 amendments to H.R.3300 which had been voted on and defeated.

House Report No. 1312, together with minority views which objected to the price exacted from Arizona to get CAP and to making the Mexican Treaty obligation a National obligation, was ordered to be printed on April 24, 1968.

In May H.R.3300 was granted a rule and CAP, which passed the Senate three times but never the House, was now before the House. After 2 days of debate on the floor of the House of Representatives in which the major elements of the bill were debated; e.g., California's 4.4 maf priority, making the Mexican Treaty obligation a National responsibility, the deletion of Bridge Canyon and Marble Canyon Dams as a result of the conservationist's arguments, studies on augmentation of the river, and the Orme Dam Indian problems, the bill, with only two of the half-dozen proposed amendments (to give the Indians the right to develop recreational facilities at Orme Dam and Congressman Saylor's amendment delaying National assumption of the Mexican Treaty obligation until the river was augmented by 2.5 million acre-feet) was passed by a voice vote of the House on May 15, 1968. This culminated 21 years of effort to get House approval. Immediately thereafter, the House moved to substitute the text of H.R.3300 after the enacting clause of S.1004. Thus the legislation was returned to the Senate as an amendment to S.1004, which had been approved by the Senate in August 1967.

H.8.7. Senate-House Conference

The Senate-House Conferees considered S.1004 from July 23 through August 1, 1978, at which time agreement was reached on the bill which included the items listed in H.8.6. above. The major disagreement between the conferees concerned Section 201 of the bill passed by the House which included direction to the Secretary of the Interior to study ways of augmenting the Colorado River. The Northwest conferees led by Senator Jackson opposed any studies of importation of Columbia River water into the Colorado. After a week of meetings a compromise was reached in the form of a revised Section 201 which directed the Secretary of the Interior to make a reconnaissance study of water supply and requirements and develop a general plan to meet the future water needs of the western United States (States west of the Continental Divide) but precluded the Secretary for a period of 10 years from studying any plan for importing water from the Columbia River Basin to the Colorado River Basin. This satisfied the Pacific Northwest States and allowed them time to inventory their future water needs. A second change was an increase from 2,500 ft^3/s to 3,000 ft^3/s in the size of the CAP aqueduct in order to permit any available surplus water to be delivered to CAP, but on condition that Arizona pay the added cost of the enlarged capacity. This seemed to provide Arizona with a tradeoff for its agreement to a California 4.4 maf priority in perpetuity. On August 1, 1968, the Senate and House conferees by a 14 to 1 vote (Congressman Saylor dissenting because of the provision making the Mexican Treaty a National obligation) agreed to report out S.1004, the Colorado River Basin Project bill, as amended by H.R.3300.

H.9. Approval by Congress of Public Law 90-537

Following adoption of the conference report (House Report No. 1861) on the Colorado River Basin Project bill (S.1004) by the House of Representatives by voice vote on September 5, 1968, and by the Senate on September 13, 1968, President Johnson signed the legislation into law on September 30, 1968, as Public Law 90-537 (see appendix 1202 for text of Act).

Senator Hayden and Arizona had finally achieved the CAP and Senator Hayden had announced his retirement at the end of the 90th Congress.

H.9.1. Details of Public Law 90-537

This complex bill includes the following key items:

(a) Authorization of the Central Arizona Project at an estimated cost of $832,000,000;

(b) Authorization of five Upper Colorado River Basin projects at an estimated cost of $392,000,000;

(c) Existing California, Arizona, and Nevada Colorado River water contractors would receive a priority over the Central Arizona Project whenever the annual usable supply is less than 7.5 million acre-feet, with California's priority limited to 4.4 million acre-feet per year; thus, the 27-year limit on California's 4.4 maf priority (to allow California time to pay off its Colorado River Aqueduct bonds) was dropped;

(d) Assumption of the Mexican Treaty burden by the United States as a National obligation when the river is augmented below Lee Ferry by 2.5 maf per year;

(e) The Secretary of the Interior is to determine water supplies and requirements and develop a plan to meet the water needs of the West but is prohibited for 10 years from undertaking reconnaissance studies of any plan for importation of water from any other natural river drainage basin lying outside the States of Arizona, California, Colorado, New Mexico, and outside of those portions of Nevada, Utah and Wyoming which are in the natural drainage basin of the Colorado River;

(f) A development fund is established to help repay future costs of augmentation;

(g) Establishment of priorities for the coordinated long-range operation of the major Colorado River reservoirs;

(h) Provision for purchase of capacity in a non-Federal thermal powerplant by the Federal Government in lieu of construction of new dams on the Colorado River;

(i) Reauthorization of the Dixie Project in Utah, in order to permit it to receive financial assistance from the Lower Basin Development Fund established by the Act;

(j) Conditional authorization of the Uintah Unit of the Central Utah Project;

(k) The right of the States to sue the United States if the Federal Government fails to comply with the "Law of the River";

(l) Direction to the Secretary to make reports as to the annual consumptive uses and losses of water from the Colorado River system after each successive 5-year period starting October 1970; and

(m) Removal from the Federal Power Commission of the right to approve the construction of any dams on the Colorado River between Glen Canyon Dam and Hoover Dam so as to permit Congress to retain control of future construction (see pages 12-15, Colorado River Board of California, Annual Report, 1968. For a section analysis see "Analysis of Public Law 90-537, Colorado River Basin Project" - Paul L. Billhymer, pages 69-97, Twentieth Annual Report of the Upper Colorado River Commission, September 30, 1968).

The text of the Colorado River Basin Project Act, dated September 30, 1968, Public Law 90-537, appears as Appendix 1202.

H.9.2 Reports Provided for by Public Law 90-537

Section 201 of Public Law 90-537 directs the Secretary of the Interior to "...conduct full and complete reconnaissance investigations for the purpose of developing a general plan to meet the future water needs of the Western United States. Such investigations shall include the long-range water supply available and the long-range water requirements in each water resource region of the Western United States. ...a final reconnaissance report shall be submitted not later than June 30, 1977...."

In April 1975, the Secretary submitted two reports on the "Critical Water Problems Facing the Eleven Western States." These are the Westwide Study Report and an Executive Summary Report. Because of their length (457 pages and 85 pages, respectively) they are not included herein, but portions of the Executive Summary appear as Appendix 1203.

However, the summary table taken from the report shows, by States and Basins, the annual onsite consumptive uses and losses including water uses satisfied by ground-water overdraft.

For the 5-year period (October 1970 to September 1975 inclusive) the average annual uses and losses for the Upper and Lower Basins are summarized as follows:

1,000 Acre-Feet

	Upper Basin	Lower Basin
Uses by Projects from Mainstream	(1)	6,400
Uses by Projects from Tributaries	3,021	4,515
Mainstream Reservoir Losses	528	1,124
Mainstream Channel Losses	(2)	380
Total Uses and Losses	3,549	12,419

(1) Included in evaluation for Tributaries.
(2) Not evaluated in the Report.

Summary - Colorado River System Consumptive Uses and Losses Report, Public Law 90-537 Water Use By States, Basins, and Tributaries[1]

(1,000 Acre-feet)

	WATER YEAR					
STATE AND BASIN OF USE	1971	1972	1973	1974	1975	Average 1971-75
Arizona	4756	5040	5128	5464	5514	5180
Upper Basin	(11)	(12)	(11)	(19)	(25)	(16)
Lower Basin Mainstream	(1181)	(1129)	(1068)	(1185)	(1208)	(1154)
Lower Basin Tributaries	(3564)	(3899)	(4049)	(4260)	(4281)	(4010)
California	5122	5328	5068	5475	4937	5186
Lower Basin	(5122)	(5328)	(5068)	(5475)	(4937)	(5186)
Colorado	1700	1775	1536	1855	1778	1729
Upper Basin	(1700)	(1775)	(1536)	(1855)	(1778)	(1729)
Nevada	131	148	154	160	154	149
Lower Basin Mainstream	(34)	(60)	(65)	(76)	(68)	(60)
Lower Basin Tributaries	(97)	(88)	(89)	(84)	(86)	(89)
New Mexico	213	218	357	237	322	270
Upper Basin	(180)	(183)	(320)	(200)	(290)	(235)
Lower Basin Tributaries	(33)	(35)	(37)	(37)	(32)	(35)
Utah	794	823	823	874	698	803
Upper Basin	(729)	(749)	(730)	(785)	(615)	(722)
Lower Basin Tributaries	(65)	(74)	(93)	(89)	(83)	(81)
Wyoming	334	304	304	364	291	319
Upper Basin	(334)	(304)	(304)	(364)	(291)	(319)
Other	1916	1919	2066	2175	2087	2033
Upper Basin Colorado River Storage Project Reservoir Evaporation	(458)	(477)	(502)	(596)	(607)	(528)
Lower Basin Mainstream Reservoir Evaporation and Channel Loss	(1458)	(1442)	(1564)	(1579)	(1480)	(1505)
Total - Colorado River System						
Upper Basin	2954	3023	2901	3223	2999	3021
Lower Basin Mainstream	6337	6517	6202	6736	6213	6400
Lower Basin Tributaries	3759	4096	4268	4470	4482	4215

Summary - Colorado River System Consumptive Uses and Losses Report,
Public Law 90-537 Water Use By States, Basins, and Tributaries[1]

(1,000 Acre-feet)

STATE AND BASIN OF USE	WATER YEAR 1971	1972	1973	1974	1975	Average 1971-75
Other - Reservoir Evaporation and Channel Loss	1916	1919	2066	2175	2087	2033
	14966	15555	15437	16604	15781	15669
Water Passing to Mexico	1561	1600	1594	1720	1656	1626
Treaty	(1501)	(1515)	(1444)	(1563)	(1429)	(1490)
Minutes 218, 241, and 242	(55)	(79)	(120)	(151)	(214)	(124)
Regulatory Waste	(5)	(6)	(30)	(6)	(13)	(12)
Total - Colorado River System and Water Passing to Mexico	16527	17155	17031	18324	17437	17295

[1]Onsite consumptive uses and losses; includes water uses satisfied by ground-water overdraft.

Section 602(b)(1) directs the Secretary to prepare reports as to the annual consumptive uses and losses of water from the Colorado River System. The first report covering water years 1971 to 1975, inclusive, has been completed and made available to the Basin States in 1977.

The Report reflects the Department of the Interior's best estimates of actual consumptive uses and losses with the Colorado River Basin. The reliability of the estimates is affected by the availability of data and the current capabilities of data evaluation. The 38-page Report appears as Appendix 1204.

H.10. Execution of CAP Repayment Contract

Following authorization on April 13, 1972, by the Arizona Legislature, a Central Arizona Water Conservation District was formed by actions of the Boards of Supervisors of Maricopa, Pima, and Pinal Counties. On December 15, 1972, the District and the Department of the Interior signed a contract for the construction of the CAP and for the repayment of its reimbursable costs.

H.11. How the Various Interests Benefited from CAP Legislation

As indicated by the zigzag path of the Colorado Riber Basin Project Act, it was a product of compromise among the various interest groups it affected. All of the Basin States suffered a defeat when they were unable to authorize immediate study of inter-Basin transfers of water and to construct Bridge Canyon and Marble Canyon hydroelectric dams to provide revenues to finance augmentation of the mainstream. However, every major interest gained something, as summarized as follows:

Arizona - Authorization of construction of CAP.

California - A guarantee of priority of 4.4 maf of water annually in times of water shortage, even if CAP had to stop its water diversions.

Upper Basin - Obtained criteria governing operation of dams so as to protect Upper Basin users against excessive drawdowns. Five reclamation projects authorized in Colorado. Uintah Project authorized and Dixie Project reauthorized in Utah. New Mexico to get additional water. Satisfaction of Mexican Treaty of 1944 made a National obligation.

Northwest - 10-year moratorium on study of water importations proposals.

Conservation Groups - Deletion of authorization of two dams on the river, one above and one below Grand Canyon (Congressional Quarterly, Inc., November 1, 1968, page 3019).

CHAPTER XIII

THE MEXICAN SALINITY PROBLEM

A. Background

The background of the Mexican Water Treaty, the negotiations in 1930 and in 1941-43, the discussions between the State Department and the Colorado River Basin States, and the events leading up to its ratification, are discussed in Chapter XIV, "The Hoover Dam Documents," 1948, Wilbur and Ely, pages 152 through 167. They are also summarized in Chapter I.F. hereof. (The text of the Mexican Water Treaty appears in Appendix I F.1.)

The Colorado River waters and ground-water pumping has irrigated approximately 475,000 acres of land in Mexicali and San Luis Valleys in northwestern Mexico. Mexicali, a city of about 400,000 people, obtains water from the Colorado River. Since 1972, Tijuana, with a population of about 500,000, has been receiving a supplemental supply of about 8,000 acre-feet of Mexican Treaty Colorado River water under a temporary agreement with several California agencies, including The Metropolitan Water District of Southern California and San Diego County Water Authority. Upon completion of an aqueduct now under construction in Mexico, Mexico will deliver 100,000 acre-feet per year to that city.

No problems arose with regard to water deliveries to Mexico between 1945 and 1961 since the salinity of the waters delivered at the Northerly Boundary was generally within 100 parts per million (100 p/m) of the water at Imperial Dam, the last major structure diverting water for users in the United States. In 1961, two unrelated events occurred which affected the salinity of the Mexican water deliveries.

First, was the action of the Wellton-Mohawk Irrigation and Drainage District, which represents the Wellton-Mohawk Division of the Gila Project in southwestern Arizona, authorized by the Gila Reauthorization Act of July 30, 1947, 61 Stat. 628, and whose construction by the United States Bureau of Reclamation was completed in 1952. In 1961, the District commenced operation of a system of drainage wells in the District which discharged saline water with approximately 6,000 p/m into the Colorado River below the Imperial Dam but above the Mexican point of diversion. This increased the salinity of the water deliveries to Mexico from an average of around 800 p/m in 1960 to nearly 1,400 p/m in 1961 and to 1,500 p/m in 1962. The daily salinity readings at times exceeded 2,000 p/m.

Secondly, there was a sharp reduction in riverflows to Mexico because of increased storage in Lake Mead. This was in anticipation of the closure of the gates at the recently constructed Glen Canyon Dam in the Upper Basin in order to begin storage of water in Lake Powell, the reservoir behind Glen Canyon Dam. For example, in the 10-year period from 1951 to 1960, Mexico received an average of 4.24 maf/yr at the Northerly International Boundary, whereas for the succeeding 10-year period from 1961 to 1970, the flow averaged 1.52 maf/yr, a quantity sufficient to fulfill the Treaty obligation of 1.5 maf/yr. This average annual reduction of 2.72 maf/yr of dilution water contributed to the increased salinity. Hence, the reduction in riverflows were incident to increased storage and use in the United States, closer controls by the Bureau of Reclamation, and lower years of runoff (J. R. Friedkin, "a Review of the 1944 Treaty Operations - 1969").

Parenthetically, it should be noted that in the past several years approximately 525,000 acre-feet per year of the 1.5 maf/yr guaranteed to Mexico under the Treaty have come from drainage water below Imperial Dam. Of the 525,000 acre-feet per year, the Wellton-Mohawk Division contributed about 220,000 acre-feet, other projects in the Yuma, Arizona, area contributed about 165,000 acre-feet, and 140,000 acre-feet per year of drainage water from Yuma Valley was delivered to Mexico at the land boundary near San Luis, Mexico (M. B. Holburt, "International Problems of the Colorado River," 1974).

B. Mexico's Objections to Salinity

In November 1961, Mexico strongly objected to the salinity of the Colorado River waters received by it and negotiations between the United States and Mexican Governments took place to resolve the matter.

At the request of the State Department, each of the Governors of the seven Colorado River Basin States appointed two members to a reconstituted Committee of Fourteen to advise the State Department. The negotiations resulted in Minute No. 218 of the International Boundary and Water Commission, United States and Mexico.

C. Minute No. 218

On March 22, 1965, a 5-year agreement, designated Minute No. 218, was concluded on practical measures to reduce the salinity of the waters reaching Mexico. Each side nonetheless reserved its legal rights. Under it, the United States took the following actions at a cost to it of $12 million:

(1) Construction and operation of an extension to the existing Wellton-Mohawk Drain, so that the Wellton-Mohawk drainage water could either be bypassed around Morelos Dam (the Mexican diversion structure), or, at Mexico's option, received above Morelos Dam where it would be mingled with other Colorado River waters delivered to Mexico.

(2) Construction of additional drainage wells in the Wellton-Mohawk Division which allowed selective pumping of the most saline drainage wells at times when Mexico would be bypassing Wellton-Mohawk drainage waters; i.e., during the winter months, and allowed the pumping of higher quality ground-water at times when Mexico would be using Wellton-Mohawk waters.

(3) Replacement of a portion of the bypassed Wellton-Mohawk drainage waters, which resulted in the release of approximately 40,000 acre-feet per year of "stored water" from Imperial Dam in excess of the 1.5 maf/yr guaranteed by the Treaty.

Under the above measures taken by the United States, the quality of the waters delivered to Mexico was improved from about an average of 1,500 p/m in 1962 to 1,240 p/m in 1971.

Minute No. 218 was to expire in November 1970, but expressly provided for consideration of a new Minute after review of the conditions which gave rise to the problem. However, the Mexican officials did not want to enter into a new long term agreement in November 1970 since a new administration was assuming office in Mexico in December 1970. Minute No. 218 was, therefore, extended for a 1-year period (Joint release, Interior and State Departments, July 1972).

Negotiations commenced in 1971 with the new Echeverria Administration. The United States, supported by the Committee of Fourteen, proposed a new Minute which would have provided Colorado River water to Mexico having the same salt concentration as would exist were the Wellton-Mohawk Division and all other projects in the United States below Imperial Dam in salt balance; i.e., the tonnage of salt in the drainage water originating from lands below Imperial Dam in the United States and delivered to Mexico would not exceed the tonnage of salt in the water applied to these lands. Under this proposal, average salinity would have been further reduced to about 1,130 p/m in 1973 (Steiner, "The Mexican Water Treaty - New Interpretations and Problems, 1973"). Mexico rejected this proposal because of the difference in quality between Colorado River water delivered to United States water users at Imperial Dam and the quality of the waters delivered to Mexico. Negotiations were discontinued pending a forthcoming meeting between Presidents Nixon and Echeverria. In the interim, Minute No. 218 was again continued (see Appendix 1301 for text of Minute No. 218).

D. Minute No. 241

On June 15 and 16, 1972, Presidents Nixon and Echeverria met and on June 17, 1972, issued a joint communique. President Echeverria stated the Mexican position regarding the Colorado River as wanting water under the 1944 Treaty to be the same quality as the water delivered to United States users at Imperial Dam. President Nixon stated that "this was a highly complex problem and needed a careful examination of all aspects." He said that the United States was prepared to take certain actions immediately to improve the quality of water going to Mexico and would designate a special representative to find a "permanent, definitive and just solution of the problem," whose report and proposal, once approved, would be submitted to President Echeverria for his consideration and approval.

The immediate action referred to by President Nixon was formalized as Minute No. 241 of the International Boundary and Water Commission (IBWC) on July 14, 1972, and replaced Minute No. 218. It was anticipated that operation thereunder would result in an estimated average annual reduction of at least 100 p/m as compared to 1971.

Minute No. 241 provided that the United States would discharge Wellton-Mohawk drainage water below Morelos Dam at the annual rate of 118,000 acre-feet per year. In place thereof, amounting to 73,000 acre-feet during the balance of 1972, the United States would substitute an equal quantity of other waters, or an additional 41,000 acre-feet of water released from above Imperial Dam and 32,000 acre-feet of water pumped from 12 wells on the Yuma Mesa. The result was that the total deliveries to Mexico exceeded the 1.5 maf/yr guaranteed by the Treaty since the bypassed Wellton-Mohawk drain waters were not counted as Treaty waters. This reduced the average annual salinity of water delivered to Mexico from 1,242 p/m in 1971 to 1,141 p/m for the year ending June 30, 1972.

Under Minute No. 241, Mexico further requested that the United States discharge the balance of the Wellton-Mohawk drainage waters (95,550 acre-feet) below Morelos Dam, for which no substitution was to be made, and which was charged to Mexico's 1.5 maf Treaty deliveries. This resulted in a further decrease of the average salinity from 1,140 p/m to 980 p/m for the year ending June 30, 1973. This was about 130 p/m higher than the mean salinity of water arriving at Imperial Dam for the same period (Holbert, *supra*). (see Appendix 1302 for text of Minute No. 241).

E. Permanent and Definitive Solution to International Salinity Problem

On August 16, 1972, President Nixon designated former Attorney General Herbert Brownell, Jr., as his special representative with the assignment of finding a permanent solution to the Mexican salinity problem.

A Federal task force consisting of representatives from a number of major departments, including Interior, State, Agriculture, Environmental Protection Agency, and the Office of Management and Budget, was formed to assist Mr. Brownell. He also met with the Committee of Fourteen to seek its advice. Mr. Brownell submitted his report to the President on December 31, 1972. The Colorado River Basin States supported the concepts of the Brownell report, subject to certain actions to avoid damage to the Colorado River Basin States.

The actions requested by the States included the following:

(1) The Federal Government should assume responsibility for replacement of the reject brine stream from the proposed desalting plant.

(2) A strengthened research program to increase the recovery rate to 90 percent of the treated water.

(3) Authorization of salinity programs upstream from Imperial Dam in addition to programs to implement the agreement with Mexico.

(4) The agreement with Mexico not to injure landowners in the United States.

(5) Power needs for the desalting plant not to be obtained from existing preference customers (see Committee of Fourteen statement, Serial No. 93-45, page 221).

Shortly thereafter, President Nixon appointed Mr. Brownell as a Special Ambassador and negotiations commenced between him and the Mexican representatives in the spring of 1973. Some of the conflicting internal views Mr. Brownell had to consider were the State Department's desire for a negotiated settlement of the problem to avoid further continued differences with Mexico and the possibility of a solution imposed by a third party such as the World Court; the desire of the Office of Management and Budget for an inexpensive solution; the concern of the seven Basin States that the solution not involve a permanent commitment to Mexico of water deliveries beyond the 1.5 maf/yr required by the Treaty although the Basin States did not object to deliveries in excess thereof on a temporary basis in order to reach a practical solution; and Mexico's position that it receive the same quality water as was delivered to United States water users from diversions at Imperial Dam, as well as a claim for damages caused by the saline waters since 1961.

Agreement was reached between Ambassador Brownell and Secretary of Foreign Relations of Mexico, Emilio O. Rabasa, in the latter part of August and was approved by the two Presidents on August 30, 1973.

The agreement was incorporated in Minute No. 242 of the International Boundary and Water Commission dated August 30, 1973, which also terminated Minute No. 241 (see Appendix No. 1303 for text of Minute No. 242).

F. Minute No. 242

The major provisions of Minute No. 242 are:

(1) The United States shall adopt measures to assure that by no later than July 1, 1974, the waters delivered to Mexico upstream from Morelos Dam will have an average annual salinity of not more than 115 p/m, plus or minus 30 p/m, over the annual average salinity at Imperial Dam. This quality guarantee becomes effective upon authorization by Congress of the funds to construct the "necessary works."

(2) Until Congress authorizes the necessary works to provide the quality guarantee, the United States shall continue to bypass Wellton-Mohawk drainage water at the annual rate of 118,000 acre-feet per year, without charge against Mexico's Treaty allotment, and substitute therefore an equal volume of better quality water.

(3) The United States will continue to deliver approximately 140,000 acre-feet of water to Mexico on the land boundary at San Luis, Mexico, in partial satisfaction of the 1.5 maf/yr Treaty requirements, with a salinity essentially the same as that of the waters customarily delivered there (approximately 1,500 p/m).

(4) The existing concrete-lined Wellton-Mohawk drain shall be extended approximately 53 miles to Santa Clara Slough (on the Gulf of California) with a capacity of 353 cubic feet per second, the same capacity as the existing drain. Construction and operation in Mexico would be performed by the Mexican Government, but at the expense of the United States.

(5) Pending the conclusion by the two governments of a comprehensive agreement on ground water in the border areas, each country shall limit pumping of ground waters in its territory within 5 miles of the Arizona-Sonora boundary near San Luis to 160,000 acre-feet annually.

(6) The United States will support efforts by Mexico to obtain appropriate financing for improvement and rehabilitation in the Mexicali Valley. The United States will also provide nonreimbursable assistance for those aspects of the rehabilitation program relating to the salinity problem, including tile drainage. The extent of the participation is to be negotiated later.

(7) The new Minute is to be recognized as a permanent and definitive solution to the Colorado River salinity problem.

G. United States Actions Under Minute No. 242

Although not spelled out in the Minute, the Administration stated that the following "measures" would be undertaken to comply with Minute No. 242:

(1) Construction of a major desalting plant and appurtenant works to treat the Wellton-Mohawk drainage waters, scheduled to be completed in December 1978.

(2) Extension of the Wellton-Mohawk drain by 53 miles to the Gulf of California.

(3) Lining or construction of a new Coachella Canal in California.

(4) Reduction in Wellton-Mohawk irrigable acreage from the 75,000 acres authorized in the Gila Reauthorization Act to 65,000 acres, and improved Wellton-Mohawk irrigation efficiency so as to reduce the quantity of "return flow" drainage water to the river.

G.1 Yuma Desalter

A major objective of the program was that the Wellton-Mohawk drainage waters would be reduced from approximately 220,000 acre-feet per year to approximately 178,000 acre-feet per year. The reverse osmosis desalting plant would treat approximately 143,000 acre-feet per year of that 178,000 acre-feet. The resulting 100,000 acre-feet per year of product water would be mixed with the 35,000 acre-feet of untreated Wellton-Mohawk water to produce a blend of water returned to the river for delivery to Mexico which then will have an average annual salinity of not more than 115 p/m plus or minus 30 p/m over the annual average salinity

of the water in the river at Imperial Dam delivered to United States users. The reject stream, which will be carried to the Gulf of California, initially will be approximately 43,000 acre-feet per year and is estimated to have a salinity of 9,600 p/m. This quantity will have to be replaced with better quality river water.

G.2 Coachella Canal Lining

It is anticipated that the new concrete-lined Coachella Canal of 49 miles in length will save approximately 130,000 acre-feet per year. This quantity will be available temporarily during a so-called "interim period" to the United States for substitution purposes through reduced deliveries to the Coachella Valley Water District. This will reduce the draft on storage to provide substitution waters to a level of 45,000 to 88,000 acre-feet per year. The interim period ceases when deliveries to California are reduced; i.e., when CAP deliveries begin.

H. Benefits to United States

The United States negotiators ascribed the following tangible benefits to the United States. The agreement eliminates the possibility of long years of controversy. It does not require any payments of monies to Mexico for any past damages. It is a "permanent solution" to the salinity problem. Mexico agreed to accept 140,000 acre-feet per year of their Treaty water right at the Arizona-Sonora boundary, which is largely drainage water with a higher salinity than that of the Colorado River. Although Mexico has accepted this water for years, there was no written agreement on Mexico's part to accept this water at this location until Minute No. 242 was signed. Although the United States has agreed to reduce the salinity of the Wellton-Mohawk drainage waters under the new agreement, other drainage waters below Imperial Dam will continue to be accepted by Mexico as part of the Treaty obligation.

I. Position of Basin States

It was the position of the Colorado River Basin States that Minute No. 242 was entered into on the basis of international comity and that the Basin States should not be expected to bear any greater burden as a result of the new agreement than that to be borne by the rest of the Nation. Therefore, they urged contemporaneous authorization of a Colorado River Basin Salinity Control Program and prompt construction of the desalter and the lining of the Coachella Canal. Their reason was that until that was done, the United States would continue to deliver 118,000 acre-feet per year to Mexico above the 1.5 maf Treaty obligation and the over-delivery would come from water supplies otherwise available to the Basin States. Furthermore, the Basin States urged that the replacement of all bypassed waters and the reject waters from the desalting plant should be the obligation of the United States because, if not replaced, there would be a permanent additional delivery to Mexico of 43,000 acre-feet per year in excess of the Treaty obligation of 1.5 maf/yr.

I.1 Well Field

Shortly before negotiation of Minute No. 242, Mexico had constructed a well field within 1 to 5 miles of the southerly United States - Mexico boundary, south of Yuma, Arizona, capable of pumping approximately 160,000 acre-feet per year of ground water which originates in the United States. If unchecked, this would result in the loss of ground water by the United States. To protect against this, a limitation on the extent of Mexican ground-water pumping was necessary so as not to impact the United States water supplies and the United States would also have to resort to a protective pumping program. It further appeared that the combined pumping of the two governments, assuming the United States installed its own well field and no agreement is reached on ground water, would ultimately dry up the Yuma Valley Drains which delivers approximately 140,000 acre-feet per year to Mexico at San Luis so that the pumping of ground water in the United States would be required to maintain deliveries of this quantity of water to San Luis.

I.2 Energy

It was estimated that approximately 35 megawatts of energy will be needed to operate the Yuma desalter and that additional power would be required for the protective ground-water pumping program. The Basin States felt strongly that these energy requirements should not deprive existing power users of presently used supplies.

I.3. Water Quality

Until the works contemplated by Minute No. 242 are operative, Mexico will receive about the same quality of water as do the United States users who divert from Imperial Dam. This requires the bypass of 118,000 acre-feet per year of Wellton-Mohawk drainage water without charge against Mexico's Treaty allotment and the substitution therefor of stored water released from Imperial Dam and pumped ground water from the Yuma Mesa, plus the continued bypass of the remainder of the Wellton-Mohawk drainage water without substitution therefor of other waters from the United States under the Treaty.

Upon authorization of the "necessary works" by Congress, the United States must provide Mexico with water which will have an annual average salinity of not more than 115 p/m, plus or minus 30 p/m, over the annual average salinity at Imperial Dam. This means that all Wellton-Mohawk drainage waters will be by-passed without charge against the Treaty obligation and the United States will substitute higher quality waters in quantities expected to drop from 220,000 acre-feet per year to 175,000 acre-feet per year, depending upon the success of the program to increase the efficiency of Wellton-Mohawk District's use of water and the reduction of the return flow quantities.

The better quality water needed to replace the bypassed water would be "borrowed" from stored water and replaced, in effect, by increased storage in Lake Mead as a result of reducing deliveries to Coachella Valley Water District in an amount equal to the salvaged losses and crediting those amounts to the United States.

J. Some Alternative Solutions to the Salinity Program

The Honorable Brownell, the President's special representative who negotiated Minute No. 242, explained during the hearings on the implementing legislation some of the alternative solutions to the Mexican water problem which were considered and not adopted. These included adjudication rather than negotiation; buy-out of the Wellton-Mohawk Irrigation District; substitution of Imperial Dam quality water for the Wellton-Mohawk drainage water; and desalting of the Wellton-Mohawk drainage (page 82, House Hearings, Serial No. 93-45).

CHAPTER XIV

COLORADO RIVER BASIN SALINITY CONTROL ACT

A. Background

Following adoption of Minute No. 242, dated August 30, 1973, legislation was proposed to implement it. The Subcommittee on Water and Power Resources of the House of Representatives held hearings on March 4, 5, and 8, 1974, to consider several bills (Serial No. 93-45). The bills were H.R.12165 and H.R.7774, which were initiated in the Committee, and H.R.12834, which was the Administration Bill.

B. Administration Bill

This bill, cited as the "International Salinity Control Project, Colorado River," proposed only those "...measures necessary to carry out the provisions of Minute No. 242...." It authorized the Secretary of State, through the Commissioner of the United States Section, IBWC, who shall consult with the Secretary of the Interior and may delegate such authority to the Secretary of Agriculture, the Army, the Interior, and the Administrator of the EPA, to:

(1) Construct, operate, and maintain a desalting complex and an extension of the bypass drain for the discharge of the reject stream from the plant and other Wellton-Mohawk drain water to the Santa Clara Slough.

(2) Accelerate cooperative management programs with the Wellton-Mohawk Irrigation and Drainage District for the purpose of reducing saline drainage flows by improving irrigation efficiency, with the District to pay its share of the costs.

(3) Acquire approximately 10,000 acres of lands within the Wellton-Mohawk Division to reduce the 75,000 irrigable acres authorized by the Gila Reauthorization Act and to acquire additional acreage as may be deemed appropriate.

(4) Assist water users in the Wellton-Mohawk Irrigation and Drainage District in installing onfarm systems as a means of reducing saline drainage return flows through improved irrigation efficiencies.

(5) In consideration of the purchase of irrigable lands and the associated increased cost of operation and maintenance of the irrigation system of the District, appropriately reduce repayment obligations of the District to the United States under existing contracts.

(6) Contract with Coachella Valley Water District to provide for reimbursement by the United States for its use of the water saved through the rehabilitation and betterment of the Coachella Canal as a temporary source of water for meeting the obligations of Minute No. 242.

(7) In consideration of the capacity to be relinquished in the All-American and Coachella Canals as a result of the rehabilitation and betterment of the Coachella Canal, appropriately reduce repayment obligations of the Imperial Irrigation District to the United States under existing contracts.

(8) For the purpose of the rehabilitation and betterment of the Coachella Canal, acquire lands within the Imperial Irrigation District on the Imperial East Mesa which receive or have been granted rights to receive water from the Imperial Irrigation District's capacity in the Coachella Canal and to dispose of such lands.

(9) Acquire lands in Painted Rock Reservoir needed to operate the project in accordance with obligations of Minute No. 242.

Section 3 provided that replacement of the reject stream from the desalting plant and of any Wellton-Mohawk drainage water resulting from essential operations bypassed to the Santa Clara Slough, except when there are surplus waters of the Colorado River under the 1944 Treaty, is recognized as a National obligation as provided in Section 202 of the Colorado River Basin Project Act. It also provided that studies to identify feasible measures to provide adequate replacement water be completed by June 30, 1980 (see Appendix 1401 for text of this bill).

C. House Committee's Bill

In contrast to the H.R.12834, the Administration's Bill, H.R.12165, initiated by the House Committee, provided in Title I for "Programs Downstream from Imperial Dam" and in Title II for "Measures Upstream from Imperial Dam."

Section 101(a) provides that the Secretary of the Interior (not the Secretary of State) is authorized and directed to proceed with a program of works of improvement for the enhancement and protection of the quality of water available in the Colorado River for use in the United States and Mexico.

Section 101(b)(1) authorizes the Secretary to construct, operate and maintain a desalting complex with an approximate capacity of 129 million gallons per day including a pretreatment plant, appurtenant works, extension of the existing bypass drain to the Santa Clara Slough in Mexico, replacement of the existing main outlet drain extension metal flume with a concrete siphon, reduction of irrigation return flows through acquisition of lands and irrigation efficiency improvements, regulation of Gila River floodwaters entering the Wellton-Mohawk Division including possible acquisition of lands above Painted Rock Dam in Arizona, and all associated facilities.

Section 101(b)(2) provides details as to the size and ability of the desalting plant and provided that the Secretary use sources of electric power that will not diminish the supply of power to preference customers from Federal power systems and that all costs associated with the desalting plant shall be nonreimbursable.

Section 101(c) made replacement of the reject stream from the desalting plant and other drainage waters bypassed to the Santa Clara Slough a National obligation and provided that studies for adequate replacement water be completed not later than June 30, 1980.

Section 101(d) authorizes the Secretary to advance funds to the United States Section of the International Boundary and Water Commission for the portion of the bypass drain in Mexico and for further transfer of such funds to a Mexican agency.

Section 101(e) provides that any desalted water not needed for the purposes of the Act may be disposed of by the Secretary and the proceeds deposited in the General Fund of the Treasury.

Section 101(f) for the purpose of reducing the return flows from the Wellton-Mohawk Division authorizes the Secretary to accelerate the cooperative program of Irrigation Management with Wellton-Mohawk to improve irrigation efficiency and to acquire 10,000 acres of irrigable land to reduce the Division's existing 75,000 irrigable acres and to acquire additional acreage if deemed necessary by the Secretary.

Section 101(g) authorizes the Secretary to dispose of acquired lands or to retain them for fish, wildlife, or other appropriate purposes.

Section 101(h) authorizes the Secretary to assist water users in the division in installing system improvements.

Section 101(i) authorizes the Secretary to amend the District's repayment contract to provide that the portion of the repayment obligation allocable to irrigable acreage eliminated from the Division shall be nonreimbursable and, if deemed appropriate by the Secretary, to give the District credit against its outstanding repayment obligation to offset any increase in operation and maintenance assessments per acre which may result from the District's decreased operation and maintenance base, all as determined by the Secretary.

Section 101(j) amends the Act of July 30, 1947, 61 Stat. 628 (the Gila Reauthorization Act), to reduce the authorized irrigable acreage as provided in Section 101(e).

Section 101(k) authorizes the Secretary to acquire lands above Painted Rock Dam that are required for temporary storage capacity to permit operation of the dam in time of flooding and to adopt other control measures below the dam.

Section 101(l) authorizes the Secretary to transfer funds to the Secretary of Agriculture for purposes required to achieve higher onfarm irrigation efficiencies.

Section 101(m) provides that all costs associated with the desalting complex shall be nonreimbursable except as provided in Sections 101(f) and 101(g).

Section 102(a) authorizes the Secretary to construct a new concrete-lined canal or to line the presently unlined initial 49 mile stretch of the Coachella Canal.

Section 102(b) provides that the construction charges shall be repayable without interest in 40 equal installments, with repayment prorated between the United States and the Coachella Valley Water District based

upon benefits each receives from the canal lining, as determined by the Secretary. The installments are nonreimbursable to the extent the United States benefits and in no event shall the United States receive such benefit after the Secretary reduces Colorado River water deliveries to California to 4.4 maf/yr.

Section 102(c) authorizes the Secretary to acquire private lands within the Imperial Irrigation District on the Imperial East Mesa which receive or have rights to receive water from Imperial Irrigation District's capacity in the Coachella Canal.

Section 102(d) authorizes the Secretary to credit Imperial Irrigation District against its final payments on account of capacity to be relinquished in the All-American and Coachella Canals as a result of the Canal lining, but that relinquishment of capacity shall not affect the established basis for allocating operation and maintenance costs of the main All-American Canal to existing contractors.

Section 103(a) provides that, if an agreement on ground-water pumping is not reached in 2 years or is not likely to be concluded within a reasonable time, the Secretary is authorized to construct, operate and maintain a well field utilizing waters of the Yuma Mesa Division, Gila Project, and the Valley Division, Yuma Project, capable of furnishing 160,000 acre-feet for use in the United States and for delivery to Mexico in satisfaction of the Treaty, and to acquire approximatrely 23,500 acres of land within approximately 5 miles of the Mexican border on the Yuma Mesa.

Section 103(b) provides that the cost of the work provided for in this section shall be nonreimbursable.

Sections 104 through 108 deal with projects modifications, contract authority, consultation with other agencies, and authorized appropriations of the money to construct the works authorized in Sections 101 and 102.

C.1 Title II - Measures Upstream From Imperial Dam

Section 201 authorizes the Secretary to implement the salinity control program adopted for the Colorado River under the authority of Section 10 of the Federal Water Pollution Control Act, to expedite the salinity control program in the Secretary's report entitled "Colorado River Water Quality Improvement Program, February, 1972," and to coordinate with the Environmental Protection Agency and the Department of Agriculture.

Section 202 authorizes the Secretary to construct the following salinity control units as the initial stage of the Basin salinity control program: Paradox Valley, which contributes about 200,000 tons of salt per year to the Colorado River system; Grand Valley, about 600,000 tons annually; Crystal Geyser, 3,000 tons annually; and the Las Vegas Wash Unit, 200,000 tons annually.

Section 213 directs the Secretary to expedite completion of planning reports on four irrigation source control units, three point source control units, and five diffuse source control units, and to submit each planning report to the Basin States for review and thereafter to submit each final report to the President, other Federal Departments, the Congress and the Basin States.

Section 203(b) directs the Secretary to cooperate with the Department of Agriculture and other governmental bodies on methods to accomplish the objectives of the Act.

Section 204 creates the Colorado River Basin Salinity Control Advisory Council, composed of three members from each State appointed by the Governors of the Basin States, which shall be advisory only.

Section 205 authorizes the Secretary to allocate the total cost of each unit authorized by Section 202 as follows: 75 percent nonreimbursable, and 25 percent allocated between the Upper Colorado River Basin Fund and the Lower Colorado River Basin Development Fund, after consultation with the Advisory Council and consideration of benefits to be derived in each Basin, causes of salinity and availability of revenues in each fund, provided that costs allocated to the Upper Colorado River Basin Fund shall not exceed 15 percent of the costs allocated to both funds.

Costs of each unit are to be repaid within a 50-year period without interest.

Section 205(b) through (d) provides necessary amendments to existing statutes.

Section 205(e) authorizes upward adjustments of rates for electrical energy under Colorado River Storage Project contracts to cover the costs of the units allocated under Sections (a)(2) and (3).

Sections 206 through 208 are administrative provisions involving Secretarial reports on the program, provide that the Act not affect the existing laws, compacts or Decree in *Arizona* v. *California*, provides for

modification of the projects, and authorizes the appropriation of funds for construction of the works authorized in Section 202.

As part of the House Committee's record during the hearings of March 4, 5 and 8, 1974, the House Subcommittee on Water and Power Resources of the Committee on Interior and Insular Affairs, received reports on the bills it had before it from the State Department dated March 1, 1974; the Department of Interior, dated March 1, 1974; the Department of Agriculture, dated March 6, 1976; and Environmental Protection Agency dated March 11, 1974. Each report advocated adoption of the Administration Bill, H.R.12834, and postponement of consideration of the H.R.12165 as it related to salinity management facilities and upstream improvements pending resolution of policy issues involved in the matter of the pollution of inter-State waters, the assessment of its national and international implications, equitable cost sharing arrangements and completion of feasibility studies. Further, that the Mexican Treaty provided that the United States Section of the International Boundary and Water Commission should have jurisdiction of works to be constructed on or along the boundary and that improvement of salinity, a domestic and costly problem, should not be joined with settlement of an international problem (see also pages 87 through 106, pages 122 through 123, 130 through 132, 135, 149 through 151, 158 through 160, 162, and 215 (Serial No. 93-45)).

C.2. Basin States Position

The reasons ascribed by Congressman Harold T. Johnson, Chairman of the Subcommittee, in behalf of H.R.12165, the Committee's Bill, rather than H.R.12834, the Administration's Bill, were that, in addition to providing the programs to settle the Mexican issue, first, it would authorize a companion program of salinity management facilities in the Colorado River Basin for the improvement of water quality; second, that water resource programs should be under the control of the Secretary of the Interior and under overview of the Committee on Interior and Insular Affairs rather than the State Department; and third, that the Administration Bill was silent on and did not come to grips with the boundary pumping problem. Arizona's Governor Williams supported this position (pages 164 and 165, Serial No. 93-45) as did Nevada (pages 170 through 174, Serial No. 93-45).

The Committee of Fourteen analyzed the need for Title II of H.R.12165 and submitted a series of correspondence between the Colorado River Basin States, the White House, the Congressional Committee, Honorable Herbert Brownell and the Congressmen and Senators of the Basin States (pages 191 through 211, Serial No. 93-45).

C.3. Need for Senate Ratification of Minute No. 242

Asked why Senate ratification was not requested for Minute No. 242, Mr. Brownell responded that Article 24 of the 1944 Mexican Treaty authorized the International Boundary and Water Commission to settle all differences that may arise between the two governments regarding the interpretation or application of the Treaty, subject to the approval of the two governments, and that both the House and Senate are now asked to authorize the works required by the Minute (Serial No. 93-45, pages 106 and 107, 120, and 153 and 154).

Also discussed during the hearings were the portions of Minute No. 242 which could be operative without Congressional action (Serial No. 93-45, pages 109 through 114, and 122). These included Article 1(b), which provided that the United States continue to deliver to Mexico at the land borders near San Luis, approximately 140,000 acre-feet per year with salinity substantially as before; i.e., higher than Imperial Dam quality; Article 2, which governs operation of the Minute and the water deliveries for the period betweeen August 30, 1973, and the date Mexico is notified that Congress has appropriated funds for the necessary works; Article 5, which limited ground-water pumping on either side of the border to 160,000 acre-feet; and Article 6, which required consultation between the two countries prior to new developments of surface or ground-water resources.

The Administration bill included no funds for the lining of the Coachella Canal since these were included in Interior's appropriation request. It was pointed out that the only program costs to be repaid were for the Coachella Canal and that repayment would be made by the Coachella Valley Water District except for the in-

terim period, or until the water is needed by California or when irrigation diversions are decreased as the Central Arizona Project goes into operation (Serial No. 93-45, pages 137 and 138, and 204).

The hearings before the House of Representatives Subcommittee on Water and Power Resources of the Committee on Interior and Insular Affairs of March 4, 5 and 8, 1974 (Serial No. 93-45), were followed by House Report No. 93-1057 dated May 22, 1974.

The Committee on Interior and Insular Affairs reported favorably on H.R.12165 which included Title I -"Programs Downstream from Imperial Dam...to deal directly with implementation of Minute No. 242..." and Title II - "Measures Upstream from Imperial Dam." The Title II provisions were not included in the Administration's proposed bill (see Appendix 1402 for text of this bill).

D. Amendments to H.R.12165

The Committee incorporated in its recommended bill some of the provisions requested by parties appearing before it. These included:

Section 101(b)(j) - in connection with the authority to acquire lands in the Painted Rock Reservoir references were inserted to the obligations of Minute No. 242.

Section 101(c) - limitations were added to the area to be studied to replace the reject stream waters, similar to those in the Colorado River Basin Project Act; i.e., "...potential sources within the States of Arizona, California, Colorado, New Mexico, and those portions of Nevada, Utah, and Wyoming which are within the natural drainage basin of the Colorado River."

Section 101(e) - authorized the "exchange" of surplus desalted waters rather than its "disposal" and provided the city of Yuma, Arizona, with a first right of refusal thereto. However, the House Committee Report No. 93-1057 stated that the incremental energy cost associated with the production of the surplus water would represent a reasonable charge.

Section 101(f)(2) - a requirement for consent of the Wellton-Mohawk Irrigation and Drainage District to the reduction in irrigable acreage below 65,000 acres. As advocated by the District, the Committee Report urged the Secretary to take all reasonable steps to avoid condemnation in accomplishing this acreage reduction. It also stated that the reduction in irrigable acreage is not intended to reduce the beneficial consumptive use of water diverted for the Wellton-Mohawk Division below the level of 300,000 acre-feet provided in the Gila Project Reauthorization Act nor affect the water rights of any of the divisions of the Gila Project as those rights are established by contract.

Section 101(g) - deletion of Secretarial authority to retain land acquired in the Wellton-Mohawk Division for fish, wildlife, or other appropriate purposes. The report stated the Committee's understanding that the lands may be utilized for fish and wildlife purposes except that they are not to receive an irrigation water supply under any circumstances.

Section 101(h) - deletion of a requirement that all costs associated with improvements that will enable water users to meet water quality requirements of State and Federal law shall be the responsibility of the water users.

Section 101(k) - deletion of Secretarial authority to adopt "other control measures below Painted Rock Dam" to permit the United States to comply with its obligation under Minute No. 242.

Section 102(a) - added a statement that the authority to line the Coachella Canal is to assist in meeting salinity control objectives of Minute No. 242 during an interim period; that the United States is entitled to the temporary use during an interim period (as defined therein, rather than ending when deliveries to California are reduced to 4.4 maf, although the Committee Report stated the latter was meant) equal to the quantity of water conserved by the lining; and that after the interim period the annual repayment installments or portions thereof shall be paid by the Coachella Valley Water District. The Committee omitted the District's proposed addition that all other repayment installments shall be nonreimbursable.

Section 102(c) - deletion of Secretarial authority to dispose of lands acquired in Imperial Irrigation District which receive or have rights to receive water from Imperial Irrigation District's capacity in the Coachella Canal, together with the rights to any water therefor and the proceeds deposited in the General Treasury. Instead, the bill provided that said lands be returned to the public domain and that the United States shall not acquire any water rights therein.

Section 102(e) - authorized the Secretary to cede certain lands to the Cocopah Tribe of Indians; that three bridges be constructed over the right-of-way for the reject stream channel; and that the foregoing constitute payment for such right-of-way.

Section 103(a)(1) - deleted a condition relating to an agreement on ground water with Mexico before the Secretary is authorized to construct a well field adjacent to the Mexican border east of San Luis, capable of furnishing approximately 160,000 acre-feet per year for use in the United States and for delivery to Mexico.

Section 103(a)(2) - authorized Arizona to exchange State owned lands, to be acquired for the well field, for Federal lands.

Section 103(a)(3) - authorized substitution of lands within Yuma Mesa Irrigation and Drainage District for lands removed from the District for the well field and for full utilization of capacity in the Gila Gravity Main Canal in addition to contracted capacities in the development of the substituted lands or any other lands in the Gila Project.

Section 103 - increased the amount authorized to be appropriated by $3 million.

E. Senate Bills

The Senate Committee on Interior and Insular Affairs considered three bills relating to salinity control measures on the Colorado River:

(1) S.1807 - to authorize several salinity control measures within the Basin not specifically associated with the Mexican agreement;

(2) S.2940 - to authorize salinity control measures within the entire Basin as well as those measures necessary to implement Minute No. 242; and

(3) A.3094 - the Administration bill to authorize the salinity control measures necessary to implement the intent of Minute No. 242.

Reports were received from the Department of the Interior, State Department and Environmental Protection Agency urging delay on Title II measures of S.2940 and stating that enactment of S.3094 is in accord with the President's program. Nevertheless, following subcommittee hearings on April 26, 1974, the full committee ordered S.2940 reported with an amendment. The amendment consisted of a new text, essentially that of H.R.12165, as amended by the full House Committee.

On June 11, 1974, the House passed H.R.12165. On June 12, 1974, the Senate passed the amended S.2940. On June 13, 1974, the House concurred in the Senate amendment. It was signed by the President on June 24, 1974. (The text of the law, cited as the "Colorado River Basin Salinity Control Act," Public Law 93-320, 88 Stat. 266, June 24, 1974, appears on Appendix 1403.)

F. Status of Program

Congress authorized appropriation of $155.5 million for construction of Title I programs and through fiscal year 1977 appropriated $93.6 million. Extensive testing of Welton-Mohawk drainage of water for problems to be overcome in desalting the water has been done. Desalting equipment and alternative desalting membrane combinations have been tested.

The portion of the brine disposal channel in Mexico has been completed with funds advanced by the United States (see "The 1973 Agreement on Colorado River Salinity Between the United States and Mexico" by M. B. Holburt, Colorado River Board of California).

Contracts have been approved between the United States with Coachella Valley Water District, dated March 14, 1978, for construction of and repayment for a new concrete-lined 49 mile section of the Coachella Canal; with Imperial Irrigation District, dated March 27, 1978, for relinquishment of capacity in the Coachella Canal and adjustment of its repayment obligation; and a contract is being finalized with Wellton-Mohawk Irrigation and Drainage District for reduction of its irrigable acreage and adjustment of its repayment obligation because of that fact and its reduced operation and maintenance base.

Work on Bureau of Reclamation Definite Plan Reports has been progressing on the salinity control measures upstream from Imperial Dam. Plans for construction of the Crystal Geysers Units have been deferred because of the relative cost effectiveness (see Twenty-Eighth Annual Report of the Colorado River Commission, September 30, 1976). Collection of specifications, design data and preparation of final designs are underway on the Paradox Valley and Grand Valley Units. Construction of the Las Vegas Wash Unit has been delayed to permit continued examination of the hydrosalinity system of the Las Vegas Wash aimed at developing a modified salinity control project. The reason therefor has been a reduction in the quantity of the ground water and salinity entering the Wash from the ground-water mound beneath the Basic Management, Inc., (BMI) evaporation ponds in Henderson since saline wastewater is now discharged by BMI into lined ponds.

G. Operations Under Minutes Nos. 218, 241, and 242

The attached table shows the operation of Minute No. 218, Minute No. 241, and Minute No. 242 during calendar years 1965 through 1976 (Colorado River Board of California, Appendix to Annual Report for Calendar Year 1975).

	Wellton-Mohawk Drainage Discharge, Acre-Feet	Salt Load Tons	Diverted Around Morelos Dam, Acre-Feet	Bypass During Minimum Treaty Order, Acre-Feet	Makeup From Storage Release (Approx.) Acre-Feet	Average Salinity of River Diverted by Mexico at NIB, p/m*
1964 Calendar Year (Year Previous to Agreement)	181,150	1,252,000				1,310
Under Minute 218						
11-16-65 to 11-15-66	216,100	1,399,000	100,800	54,400	15,000	1,310
11-16-66 to 11-15-67	211,200	1,324,000	99,000	58,300	35,000	1,210
11-16-67 to 11-15-68	219,800	1,317,000	103,900	52,600	47,300	1,190
11-16-68 to 11-15-69	218,300	1,227,000	103,600	53,500	49,900	1,180
11-16-69 to 11-15-70	219,500	1,130,000	129,700	53,900	53,900	1,140
11-16-70 to 11-16-71	215,900	1,081,000	103,200	55,100	31,300	1,160
11-16-71 to 7-13-72	136,700	**	68,300	26,400	**	1,106
Under Minute 241						
7-14-72 to 12-31-72	101,600	**	100,300	39,500	**	1,030

	Wellton-Mohawk Drainage Discharge, Acre-Feet	Salt Load Tons	Diverted Around Morelos Dam, Acre-Feet	Bypass During Minimum Treaty Order, Acre-Feet	Makeup From Storage Release (Approx.) Acre-Feet	Average Salinity of River Diverted by Mexico at NIB, p/m*
Under Minute 241 and 242						
1-1-73 to 12-31-73	207,600	**	207,600	-	59,000	979
Under Minute 242						
1-1-74 to 12-31-74	210,700	**	210,700	-	101,700	962
1-1-75 to 12-31-75	214,700	**	214,700	-	158,500	964
1-1-76 to 12-31-76	205,400	**	205,400	-	158,400	955

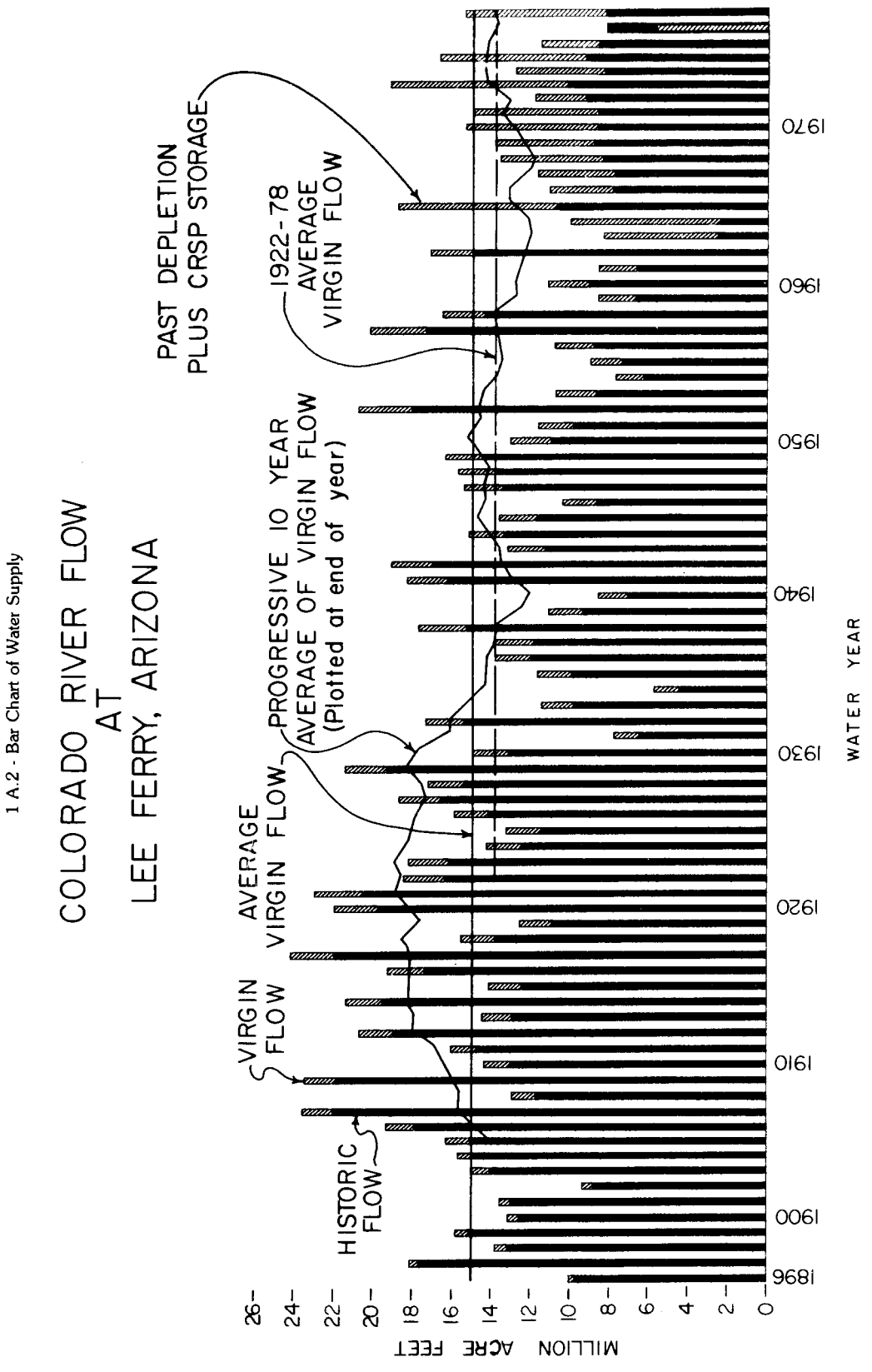
*Excludes water diverted around Morelos Dam, both water bypassed under Minutes 218, 241, and 242, and water voluntarily bypassed by Mexico.

**Data not available.

APPENDICES

APPENDIX I - THE LAW OF THE RIVER

1 A.2 - Bar Chart of Water Supply
1 B.4 - 1922 Compact
1 B.5 - The California Limitation Act, approved March 4, 1929
1 B.6 - The Boulder Canyon Project Act, December 21, 1928
1 C.6 - The Boulder Canyon Project Adjustment Act, July 19, 1940
1 D.1 - The California Seven-Party Agreement, August 18, 1931
1 F.1 - The Mexican Water Treaty, February 3, 1944
1 G.1 - The Upper Colorado River Basin Compact, October 11, 1948
1 H.1 - The Colorado River Storage Project Act, April 11, 1956



1 A.2 - Bar Chart of Water Supply

1 B.4

Colorado River Compact, 1922

The States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, having resolved to enter into a compact under the Act of the Congress of the United States of America approved August 19, 1921 (42 Statutes at Large, page 171), and the Acts of the Legislatures of the said States, have through their Governors appointed as their Commissioners:

W.S. Norviel for the State of Arizona,
W.F. McClure for the State of California,
Delph E. Carpenter for the State of Colorado,
J.G. Scrugham for the State of Nevada,
Stephen B. Davis, Jr., for the State of New Mexico,
R.E. Caldwell for the State of Utah,
Frank C. Emerson for the State of Wyoming,

who, after negotiations participated in by Herbert Hoover appointed by The President as the representative of the United States of America, have agreed upon the following articles:

ARTICLE I

The major purposes of this compact are to provide for the equitable division and apportionment of the use of the waters of the Colorado River System; to establish the relative importance of different beneficial uses of water, to promote interstate comity; to remove causes of present and future controversies; and to secure the expeditious agricultural and industrial development of the Colorado River Basin, the storage of its waters, and the protection of life and property from floods. To these ends the Colorado River Basin is divided into two Basins, and an apportionment of the use of part of the water of the Colorado River System is made to each of them with the provision that further equitable apportionments may be made.

ARTICLE II

As used in this compact—

(a) The term "Colorado River System" means that portion of the Colorado River and its tributaries within the United States of America.

(b) The term "Colorado River Basin" means all of the drainage area of the Colorado River System and all other territory within the United States of America to which the waters of the Colorado River System shall be beneficially applied.

(c) The term "States of the Upper Division" means the States of Colorado, New Mexico, Utah, and Wyoming.

(d) The term "States of the Lower Division" means the States of Arizona, California, and Nevada.

(e) The term "Lee Ferry" means a point in the main stream of the Colorado River one mile below the mouth of the Paria River.

(f) The term "Upper Basin" means those parts of the States of Arizona, Colorado, New Mexico, Utah, and Wyoming within and from which waters naturally drain into the Colorado River System above Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the System above Lee Ferry.

(g) The term "Lower Basin" means those parts of the States of Arizona, California, Nevada, New Mexico, and Utah within and from which waters naturally drain into the Colorado River System below Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the System below Lee Ferry.

(h) The term "domestic use" shall include the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but shall exclude the generation of electrical power.

ARTICLE III

(a) There is hereby apportioned from the Colorado River System in perpetuity to the Upper Basin and to the Lower Basin, respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum, which shall include all water necessary for the supply of any rights which may now exist.

(b) In addition to the apportionment in paragraph (a), the Lower Basin is hereby given the right to increase its beneficial consumptive use of such waters by one million acre-feet per annum.

(c) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River System, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then, the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d).

(d) The States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of this compact.

(e) The States of the Upper Division shall not withhold water, and the States of the Lower Division shall not require the delivery of water, which cannot reasonably be applied to domestic and agricultural uses.

(f) Further equitable apportionment of the beneficial uses of the waters of the Colorado River System unapportioned by paragraphs (a), (b), and (c) may be made in the manner provided in paragraph (g) at any time after October first, 1963, if and when either Basin shall have reached its total beneficial consumptive use as set out in paragraphs (a) and (b).

(g) In the event of a desire for a further apportionment as provided in paragraph (f) any two signatory States, acting through their Governors, may give joint notice of such desire to the Governors of the other signatory States and to The President of the United States of America, and it shall be the duty of the Governors of the signatory States and of The President of the United States of America forthwith to appoint representatives, whose duty it shall be to divide and apportion equitably between the Upper Basin and Lower Basin the beneficial use of the unapportioned water of the Colorado River System as mentioned in paragraph (f), subject to the legislative ratification of the signatory States and the Congress of the United States of America.

ARTICLE IV

(a) Inasmuch as the Colorado River has ceased to be navigable for commerce and the reservation of its waters for navigation would seriously limit the development of its Basin, the use of its waters for purposes of navigation shall be subservient to the uses of such waters for domestic, agricultural, and power purposes. If the Congress shall not consent to this paragraph, the other provisions of this compact shall nevertheless remain binding.

(b) Subject to the provisions of this compact, water of the Colorado River System may be impounded and used for the generation of electrical power, but such impounding and use shall be subservient to the use and consumption of such water for agricultural and domestic purposes and shall not interfere with or prevent use for such dominant purposes.

(c) The provisions of this article shall not apply to or interfere with the regulation and control by any State within its boundaries of the appropriation, use, and distribution of water.

ARTICLE V

The chief official of each signatory State charged with the administration of water rights, together with the Director of the United States Reclamation Service and the Director of the United States Geological Survey shall cooperate, ex-officio:

(a) To promote the systematic determination and coordination of the facts as to flow, appropriation, consumption, and use of water in the Colorado River Basin, and the interchange of available information in such matters.

(b) To secure the ascertainment and publication of the annual flow of the Colorado River at Lee Ferry.

(c) To perform such other duties as may be assigned by mutual consent of the signatories from time to time.

ARTICLE VI

Should any claim or controversy arise between any two or more of the signatory States: (a) with respect to the waters of the Colorado River System not covered by the terms of this compact; (b) over the meaning or performance of any of the terms of this compact; (c) as to the allocation of the burdens incident to the performance of any article of this compact or the delivery of waters as herein provided; (d) as to the construction or operation of works within the Colorado River Basin to be situated in two or more States, or to be constructed in one State for the benefit of another State; or (e) as to the diversion of water in one State for the benefit of another State; the Governors of the States affected, upon the request of one of them, shall forthwith appoint Commissioners with power to consider and adjust such claim or controversy, subject to ratification by the Legislatures of the States so affected.

Nothing herein contained shall prevent the adjustment of any such claim or controversy by any present method or by direct future legislative action of the interested States.

ARTICLE VII

Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes.

ARTICLE VIII

Present perfected rights to the beneficial use of waters of the Colorado River System are unimpaired by this compact. Whenever storage capacity of 5,000,000 acre-feet shall have been provided on the main Colorado River within or for the benefit of the Lower Basin, then claims of such rights, if any, by appropriators or users of water in the Lower Basin against appropriators or users of water in the Upper Basin shall attach to and be satisfied from water that may be stored not in conflict with Article III.

All other rights to beneficial use of waters of the Colorado River System shall be satisfied solely from the water apportioned to that Basin in which they are situate.

ARTICLE IX

Nothing in this compact shall be construed to limit or prevent any State from instituting or maintaining any action or proceeding, legal or equitable, for the protection of any right under this compact or the enforcement of any of its provisions.

ARTICLE X

This compact may be terminated at any time by the unanimous agreement of the signatory States. In the event of such termination all rights established under it shall continue unimpaired.

ARTICLE XI

This compact shall become binding and obligatory when it shall have been approved by the Legislatures of each of the signatory States and by the Congress of the United States. Notice of approval by the Legislatures shall be given by the Governor of each signatory State to the Governors of the other signatory States and to

the President of the United States, and the President of the United States is requested to give notice to the Governors of the signatory States of approval by the Congress of the United States.

IN WITNESS WHEREOF, the Commissioners have signed this compact in a single original, which shall be deposited in the archives of the Department of State of the United States of America and of which a duly certified copy shall be forwarded to the Governor of each of the signatory States.

DONE at the City of Santa Fe, New Mexico, this twenty-fourth day of November, A.D. One Thousand Nine Hundred and Twenty-two.

W. S. NORVIEL
W. F. McCLURE
DELPH E. CARPENTER
J. G. SCRUGHAM
STEPHEN G. DAVIS, JR.
R. E. CALDWELL
FRANK C. EMERSON

Approved:
HERBERT HOOVER

NOTES

Congressional consent to negotiations.—The Act of August 19, 1921 (42 Stat. 171), gave Congress' consent to the negotiation by the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming of "a compact or agreement not later than January 1, 1923, providing for an equitable division and apportionment among said States of the water supply of the Colorado River and of the streams tributary thereto • • •." Provision was made in the Act for appointment by the President of a person to participate in the negotiations "as the representative of and for the protection of the interests of the United States • • •." It was also provided that no compact so negotiated should become effective "unless and until the same shall have been approved by the legislature of each of said States and by the Congress of the United States."

Congressional consent to compact.—By section 13, subsection (a), of the Boulder Canyon Project Act (45 Stat. 1057, 1064), the Congress "approved" the Colorado River Compact and waived the provision of Article XI requiring that it be ratified by the legislatures of all seven States. In so doing, it provided that the Congress' approval should "become effective when the State of California and at least five of the other States mentioned, shall have approved or may hereafter approve said compact • • • and shall consent to such waiver • • •." Section 4, subsection (a), of the same Act provided, among other things, that the Act should not be effective until the compact had been ratified by all seven States or until it had been ratified by California and five other States and "until the State of California by act of its legislature, shall agree irrevocably and unconditionally with the United States and for the benefit of the States of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, as an express covenant and in consideration of the passage of this Act, that the aggregate annual consumptive use (diversions less returns to the river) of water of and from the Colorado River for use in the State of California, including all uses under contracts made under the provisions of this Act and all water necessary for the supply of any rights which may now exist, shall not exceed four million four hundred thousand acre-feet of the waters apportioned to the lower basin States by paragraph (a) of Article III of the Colorado River compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact, such uses always to be subject to the terms of said compact." For the Act of the California legislature agreeing to this condition, see its Act of March 4, 1929, Cal. Stats. 1929, p. 38. For the President's proclamation of June 25, 1929, declaring that the conditions of the Boulder Canyon Project Act had been fulfilled, see 46 Stat. 3000.

The evolution of the Boulder Canyon Project Act can be traced in the following bills and the hearings, committee reports and floor debate thereon indicated:

H.R. 11449, 67th Congress (Hearings before House Committee on Irrigation of Arid Lands, 1922-23).

H.R. 2903, 68th Congress (Hearings before House Committee on Irrigation of Arid Lands, 1923, and before House Committee on Irrigation and Reclamation, 1923-24).

S. 727, 68th Congress (Hearings before Senate Committee on Irrigation and Reclamation, 1924-25).

H.R. 6251 and H.R. 9826, 69th Congress (Hearings before House Committee on Irrigation and Reclamation, 1926; H. Rept. No. 1657 on H.R. 9826, 1926; Hearings before House Committee on Rules, 1927; 67 *Cong. Rec.* 5424-5427; 68 *Cong. Rec.* 2633-2637, 2652-2654, 3073-3080, 3272-3273, 3292-3294, 5822-5832).

S. 3331, 69th Congress (Hearings before Senate Committee on Irrigation and Reclamation, acting pursuant to S. Res. 320, 68th Congress, 1925-26; S. Rept. No. 654, 1926; 67 *Cong. Rec.* 8139-8150, 12619-12627; 68 *Cong.* Rec. 2369-2374, 2761-2765, 4156-4161, 4290-4307, 4309-4326, 4405-4416, 4421-4424, 4426-4456, 4495-4523, 4529-4530, 4541-4542, 4652-4653, 4655, 4763-4766, 4892, 4896-4900).

H.R. 5770, 70th Congress (Hearings before House Committee on Irrigation and Reclamation, 1928).

S. 728 and S. 1274, 70th Congress (Hearings before Senate Committee on Irrigation and Reclamation, 1928; S. Rept. No. 592 on S. 728, 1928; 69 *Cong. Rec.* 7245-7253, 7387-7397, 7515-7544, 7622-7627, 7630-7638, 9433-9443, 9449-9464, 9886-9891, 10200-10202, 10257-10266, 10271-10282, 10287-10302, 10462-10510, 10511-10513).

H.R. 5773, 70th Congress (Hearings before House Committee on Irrigation and Reclamation, 1928; H. Rept. No. 918, 1928; Hearings before Committee on Rules, 1928; 69 *Cong. Rec.* 9486-9513, 9622-9658, 9662-9664, 9760-9769, 9770-9786, 9975-9991; 70 *Cong. Rec.* 67-80, 227-245, 264-269, 277-298, 314-340, 381-402, 458-474, 518-530, 565-603, 615-621, 830-838; P.L. 642, 70th Congress).

State ratifications.—Arizona, Act of February 24, 1944 (Sess. L. 1944, p. 428; Ariz. Rev. Stat. Ann. 1956, sec. 45-571).

California, Act of March 4, 1929 (Stats. 1929, p. 37; Deering's Gen. L. (1944), Act 1491).

Colorado, Act of February 26, 1925 (Sess. L. 1925, p. 525; Colo. Rev. Stat. 1963, sec. 149-2-1).

Nevada, Act of March 18, 1925 (Stat. 1925, p. 134; Nev. Rev. Stat. 1957, sec. 538.010).

New Mexico, Act of March 17, 1925 (Laws 1925, p. 116; N.M. Stat. 1953 Ann., sec. 75-34-3 note).

Utah, Act of March 6, 1929 (Laws 1929, p. 25), on which see 36 Op. Atty. Gen. 72 (1929), holding this act in conformity with the requirements of the Boulder Canyon Project Act.

Wyoming, Act of February 25, 1925 (Sess. L. 1925, p. 85; Wyo. Stat. 1957, sec. 41-505).

The foregoing citations are to the final ratifications by the States concerned. Those of California, Colorado, Nevada, New Mexico, Utah, and Wyoming contained a waiver of the seven-State approval provision of Article XI of the compact. For earlier ratifications of the compact as a seven-State instrument, see Cal. Stat. 1923, p. 1530; Cal. Stats. 1929, p. 1; Colo. Sess. L. 1923, p. 684; Nev. Stat. 1923, p. 393; N. Mex. Laws 1923, p. 7; Utah Laws, 1923, p. 4; Wyo. Sess. L. 1923, p. 3. And, for earlier ratifications of the compact as a six-State instrument, see Cal. Stats. 1925, p. 1321; Utah Laws 1925, p. 127, repealed Utah Laws 1927, p. 1.

Related legislation.—In addition to the Boulder Canyon Project Act (45 Stat. 1057), sections 4(a), 6, 8, 13 and 18, see the Acts of August 30, 1935 (49 Stat. 1028, 1039) (Headgate Rock dam, Arizona), July 30, 1947 (61 Stat. 628) (Gila project, Arizona), October 11, 1951 (65 Stat. 404) (San Diego Aqueduct, California), July 3, 1952 (66 Stat. 325) (Collbran project, Colorado), August 31, 1954 (68 Stat. 1045) (Palo Verde weir, California), April 11, 1956 (70 Stat. 105) (Colorado River storage project and participating projects), September 2, 1958 (72 Stat. 1726) (Boulder City, Nevada), June 13, 1962 (76 Stat. 96) (Navajo and San Juan-Chama projects, New Mexico-Colorado), August 6, 1962 (76 Stat. 389) (Fryingpan-Arkansas project, Colorado), September 2, 1964 (78 Stat. 848) (Dixie project, Utah), October 22, 1965 (79 Stat. 1068) (Southern Nevada project, Nevada), and September 30, 1968 (82 Stat. 885) (Colorado River Basin project).

Section 6 of the Boulder Canyon Project Act, cited in the preceding paragraph, provides that Hoover dam shall be used "First, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and satisfaction of present perfected rights in pursuance of Article VIII of said Colorado River compact; and third, for power." See *Arizona* v. *California*, pp. 531, 534f, *post* on the relation between this provision and Article IV, paragraph (a), of the Colorado River Compact.

Litigation.—In addition to the four cases entitled *Arizona* v. *California*, pp. 531ff *post*, all of which involve aspects of the Colorado River Compact, see *United States* v. *Arizona*, 295 U.S. 174 (1935), dealing with the authority of the Secretary of the Interior to construct Parker Dam on the Colorado River.

Departmental decisions.—Solicitor's opinion M. 28389 (April 4, 1936), advising that the Colorado River Compact authorizes the diversion of water from the natural watershed into another watershed "if the diverted water is to be used within the boundaries of the States through which the Colorado River system extends and • • • if the amount of that diversion does not create a use of Colorado River water in excess of that allowed by the provisions of the compact." See also Solicitor's opinion dated August 30, 1934 (54 I.D. 593), advising that section 4(a) of the Boulder Canyon Project Act, taken with Article III(a) of the compact, limits the authority of the Secretary of the Interior in making contracts for the sale and delivery of water impounded behind Hoover Dam to users outside of California to such quantities as will not "interfere with the apportionment to California" made in the section of the Boulder Canyon Project Act cited.

Proposed Lower Colorado River Compact.—By its Act of March 3, 1939 (Ariz. Laws 1939, p. 71), the legislature of Arizona proposed and "approved and accepted" a compact with the States of California and Nevada, neither of which has ratified the document. The proposed compact reads as follows:

"The states of Arizona, California and Nevada, desiring to enter into a compact or agreement under the Act of Congress of the United States of America approved December 21, 1928 (45 Statutes at Large, page 1057, 'Boulder Canyon Project Act'), have agreed upon the following articles:

"ARTICLE I

"The major purposes of this Compact are to provide for the equitable division and apportionment of the use of the waters of the Colorado River System apportioned to the Lower Basin under the Colorado River Compact; to establish the relative importance of different beneficial uses of such water; to promote interstate comity; to remove causes of present and future controversies; and to secure the expeditious agricultural and industrial development of the Lower Basin, the storage of its waters, and the protection of life and property from floods.

"ARTICLE II

"As used in this compact:

" 'Colorado River System' means that portion of the Colorado River and its tributaries within the United States of America;

" 'Colorado River Basin' means all of the drainage area of the Colorado River System and all other territory within the United States of America to which the waters of the Colorado River System shall be beneficially applied:

" 'States of the Upper Division' means the states of Colorado, New Mexico, Utah, and Wyoming;

" 'States of the Lower Division' means the states of Arizona, California and Nevada;

" 'Lee's Ferry' means a point in the main stream of the Colorado River one mile below the mouth of the Paria River;

" 'Upper Basin' means those parts of the states of Arizona, Colorado, New Mexico, Utah and Wyoming within and from which waters naturally drain into the Colorado River System above Lee's Ferry, and also all parts of said states located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the system above Lee's Ferry;

" 'Lower Basin' means those parts of the states of Arizona, California, Nevada, New Mexico and Utah within and from which waters naturally drain into the Colorado River System below Lee's Ferry, and also all parts of said states located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the system below Lee's Ferry;

" 'Domestic Use' includes the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but excludes the generation of electrical power.

"ARTICLE III

"(a) The aggregate annual consumptive use (diversions less returns to the river) of water of and from the Colorado River for use in the state of California, including all uses under contracts made under the provisions

of the Boulder Canyon Project Act and all waters necessary for the supply of any rights which may now exist, shall not exceed four million, four hundred thousand acre feet of the waters apportioned to the Lower Basin States by paragraph (a) of Article III of the Colorado River Compact, plus not more than one-half of any excess or surplus waters unapportioned by said Colorado River Compact, such uses always to be subject to the terms of said compact.

"(b) Of the seven million, five hundred thousand acre feet annually apportioned to the Lower Basin by paragraph (a) of Article III of the Colorado River Compact, there is hereby apportioned annually to the state of Nevada three hundred thousand acre feet and annually to the state of Arizona two million, eight hundred thousand acre feet for the exclusive beneficial consumptive use by said states of Nevada and Arizona, respectively, in perpetuity.

"(c) The state of Arizona may annually use one-half of the excess or surplus waters unapportioned by the Colorado River Compact.

"(d) In addition to the water covered by paragraphs (b) and (c) hereof, the state of Arizona shall have the exclusive beneficial consumptive use of the Gila River and its tributaries within the boundaries of the state of Arizona in perpetuity.

"(e) The waters of the Gila River and its tributaries, except return flow after the same enters the Colorado River, shall never be subject to any diminution whatever by any allowance of water which may be made by treaty or otherwise to the United States of Mexico, but if, as provided in paragraph (c) of Article III of the Colorado River Compact, it shall become necessary to supply water to the United States of Mexico from waters over and above the quantities which are surplus as defined by said Colorado River Compact, then the state of California shall and does mutually agree with the state of Arizona to supply, out of the main stream of the Colorado River, one-half of any deficiency which must be supplied to Mexico by the Lower Basin.

"(f) Neither the states of Arizona, California nor Nevada will withhold water nor require the delivery of water which can not reasonably be applied to domestic and agricultural uses.

"(g) All the provisions of this compact or agreement shall be subject in all particulars to the provisions of the Colorado Compact.

"ARTICLE IV

"This compact or agreement shall take effect and become binding and obligatory when it shall have been approved by the Congress of the United States of America, by the legislatures of each of the states of Arizona, California and Nevada and when the States of Arizona, California and Nevada shall have ratified the Colorado River Compact. When approved by the legislature of a signatory state the original and four copies of this compact or agreement shall be signed by the governor of such state and notice of such approval and signing shall be given by such governor to the governors of the other signatory states and to the President of the United States of America. The governor last signing shall forward the original copy for deposit in the archives of the Department of State of the United States of America and one copy to the governor of each of the other signatory states."

By the second paragraph of section 4, subsection (a), of the Boulder Canyon Project Act (45 Stat. 1057, 1059), the Congress "authorized" Arizona, California, and Nevada "to enter into an agreement which shall provide (1) that of the 7,500,000 acre-feet annually apportioned to the lower basin by paragraph (a) of Article III of the Colorado River compact, there shall be apportioned to the State of Nevada 300,000 acre-feet and to the State of Arizona 2,800,000 acre-feet for exclusive beneficial consumptive use in perpetuity, and (2) that the State of Arizona may annually use one-half of the excess or surplus waters unapportioned by the Colorado River compact, and (3) that the State of Arizona shall have the exclusive beneficial consumptive use of the Gila River and its tributaries within the boundaries of said State, and (4) that the waters of the Gila River and its tributaries, except return flow after the same enters the Colorado River, shall never be subject to any diminution whatever by any allowance of water which may be made by treaty or otherwise to the United States of Mexico but if, as provided in paragraph (c) of Article III of the Colorado River compact, it shall become necessary to supply water to the United States of Mexico from waters over and above the quantities which are surplus as defined by said compact, then the State of California shall and will mutually agree with the State of Arizona to supply, out of the main stream of the Colorado River, one-half of any deficiency

which must be supplied to Mexico by the lower basin, and (5) that the State of California shall and will further mutually agree with the States of Arizona and Nevada that none of said three States shall withhold water and none shall require the delivery of water, which cannot reasonably be applied to domestic and agricultural uses, and (6) that all of the provisions of said tri-State agreement shall be subject in all particulars to the provisions of the Colorado River Compact, and (7) said agreement to take effect upon the ratification of the Colorado River compact by Arizona, California, and Nevada."

Cf. section 8, subsection (b), of the Boulder Canyon Project Act (45 Stat. 1057, 1062) providing that in the event a compact between Arizona, California, and Nevada or any two of them was negotiated and consented to by the Congress on or before January 1, 1929, the United States would be controlled thereby in its construction, management, and operation of Hoover dam and the other works authorized by the Act, but that if such a compact were concluded after that date the compact should be subject to all contracts entered into by the Secretary of the Interior under authority of section 5 of the Act prior to the date of Congress' consent thereto.

Upper Colorado River Compact.—For text, see pp. 339ff *post.*

Mexican Water Treaty.—For text, see pp. 456ff *post.*

Bibliography.—Olson, *The Colorado River Compact* (1963); Wilbur and Ely, *The Hoover Dam Documents* (2d ed., 1948; House Document No. 717, 80th Congress). The minutes of the first 18 meetings of the commission which negotiated the Colorado River Compact were published in 1948 by the Colorado State Water Conservation Board; those of the 19th-25th, 26th (first part), and 27th meetings were reproduced by the Department of Justice in 1953. All of these minutes were also reproduced by the Upper Colorado River Commission, Grand Junction, Colo., 1956.

1 B.5

CALIFORNIA LIMITATION ACT

(Act of March 4, 1929; Ch. 16, 48th Sess.; Statutes and Amendments to the Codes, 1929, pp. 38-39)

Chapter 16

An act to limit the use by California of the waters of the Colorado river in compliance with the act of congress known as the "Boulder canyon project act," approved December 21, 1928, in the event the Colorado river compact is not approved by all of the states signatory thereto

(Approved by the Governor March 4, 1929; in effect August 14, 1929)

The people of the State of California do enact as follows:

Section 1. In the event the Colorado river compact signed at Santa Fe, New Mexico, November 24, 1922, and approved by and set out at length in that certain act entitled "An act to ratify and approve the Colorado river compact, signed at Santa Fe, New Mexico, November 24, 1922, to repeal conflicting acts of resolutions and directing that notice be given by the governor of such ratifications and approval," approved January 10, 1929 (statutes 1929, chapter 1), is not approved within six months from the date of the passage of that certain act of the congress of the United States known as the "Boulder canyon project act," approved December 21, 1928, by the legislatures of each of the seven states signatory thereto, as provided by article eleven of the said Colorado river compact, then when six of said states, including California, shall have ratified and approved said compact, and shall have consented to waive the provisions of the first paragraph of article eleven of said compact which makes the same binding and obligatory when approved by each of the states signatory thereto, and shall have approved said compact without conditions save that of such six states approval and the President by public proclamation shall have so declared, as provided by the said "Boulder canyon project act," the State of California as of the date of such proclamation agrees irrevocably and unconditionally with the United States and for the benefit of the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming as an express covenant and in consideration of the passage of the said "Boulder canyon project act" that the aggregate annual consumptive use (diversions less returns to the river) of water of and from the Colorado river for use in the State of California including all uses under contracts made under the provisions of said "Boulder canyon project act," and all water necessary for the supply of any rights which may now exist, shall not exceed four million four hundred thousand acre-feet of the waters apportioned to the lower basin states by paragraph "a" of article three of the said Colorado river compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact, such uses always to be subject to the terms of said compact.

Sec. 2. By the act the State of California intends to comply with the conditions respecting limitation on the use of water as specified in subdivision 2 of section 4(a) of the said "Boulder canyon project act" and this act shall be so construed.

1 B.6

BOULDER CANYON PROJECT ACT

[PUBLIC—No. 642—70TH CONGRESS]
[H. R. 5773]

AN ACT To provide for the construction of works for the protection and development of the Colorado River Basin, for the approval of the Colorado River compact, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of controlling the floods, improving navigation and regulating the flow of the Colorado River, providing for storage and for the delivery of the stored waters thereof for reclamation of public lands and other beneficial uses exclusively within the United States, and for the generation of electrical energy as a means of making the project herein authorized a self-supporting and financially solvent undertaking, the Secretary of the Interior, subject to the terms of the Colorado River compact hereinafter mentioned, is hereby authorized to construct, operate, and maintain a dam and incidental works in the main stream of the Colorado River at Black Canyon or Boulder Canyon adequate to create a storage reservoir of a capacity of not less than twenty million acre-feet of water and a main canal and appurtenant structures located entirely within the United States connecting the Laguna Dam, or other suitable diversion dam, which the Secretary of the Interior is hereby authorized to construct if deemed necessary or advisable by him upon engineering or economic considerations, with the Imperial and Coachella Valleys in California, the expenditures for said main canal and appurtenant structures to be reimbursable, as provided in the reclamation law, and shall not be paid out of revenues derived from the sale or disposal of water power or electric energy at the dam authorized to be constructed at said Black Canyon or Boulder Canyon, or for water for potable purposes outside of the Imperial and Coachella Valleys: *Provided, however,* That no charge shall be made for water or for the use, storage, or delivery of water for irrigation or water for potable purposes in the Imperial or Coachella Valleys; also to construct and equip, operate, and maintain at or near said dam, or cause to be constructed, a complete plant and incidental structures suitable for the fullest economic development of electrical energy from the water discharged from said reservoir; and to acquire by proceedings in eminent domain, or otherwise, all lands, rights-of-way, and other property necessary for said purposes.

SEC. 2. (a) There is hereby established a special fund, to be known as the "Colorado River Dam fund" (hereinafter referred to as the "fund"), and to be available, as hereafter provided, only for carrying out the provisions of this Act. All revenues received in carrying out the provisions of this Act shall be paid into and expenditures shall be made out of the fund, under the direction of the Secretary of the Interior.

(b) The Secretary of the Treasury is authorized to advance to the fund, from time to time and within the appropriations therefor, such amounts as the Secretary of the Interior deems necessary for carrying out the provisions of this Act, except that the aggregate amount of such advances shall not exceed the sum of $165,000,000. Of this amount the sum of $25,000,000 shall be allocated to flood control and shall be repaid to the United States out of 62½ per centum of revenues, if any, in excess of the amount necessary to meet periodical payments during the period of amortization, as provided in section 4 of this Act. If said sum of $25,000,000 is not repaid in full during the period of amortization, then 62½ per centum of all net revenues shall be applied to payment of the remainder. Interest at the rate of 4 per centum per annum accruing during the year upon the amounts so advanced and remaining unpaid shall be paid annually out of the fund, except as herein otherwise provided.

(c) Moneys in the fund advanced under subdivision (b) shall be available only for expenditures for construction and the payment of interest, during construction, upon the amounts so advanced. No expenditures out of the fund shall be made for operation and maintenance except from appropriations therefor.

(d) The Secretary of the Treasury shall charge the fund as of June 30 in each year with such amount as may be necessary for the payment of interest on advances made under subdivision (b) at the rate of 4 per centum per annum accrued during the year upon the amounts so advanced and remaining unpaid, except that if the fund is insufficient to meet the payment of interest the Secretary of the Treasury may, in his discretion, defer any part of such payment, and the amount so deferred shall bear interest at the rate of 4 per centum per annum until paid.

(e) The Secretary of the Interior shall certify to the Secretary of the Treasury, at the close of each fiscal year, the amount of money in the fund in excess of the amount necessary for construction, operation, and maintenance, and payment of interest. Upon receipt of each such certificate the Secretary of the Treasury is authorized and directed to charge the fund with the amount so certified as repayment of the advances made under subdivision (b), which amount shall be covered into the Treasury to the credit of miscellaneous receipts.

SEC. 3. There is hereby authorized to be appropriated from time to time, out of any money in the Treasury not otherwise appropriated, such sums of money as may be necessary to carry out the purposes of this Act, not exceeding in the aggregate $165,000,000.

SEC. 4. (a) This Act shall not take effect and no authority shall be exercised hereunder and no work shall be begun and no moneys expended on or in connection with the works or structures provided for in this Act, and no water rights shall be claimed or initiated hereunder, and no steps shall be taken by the United States or by others to initiate or perfect any claims to the use of water pertinent to such works or structures unless and until (1) the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming shall have ratified the Colorado River compact, mentioned in section 13 hereof, and the President by public proclamation shall have so declared, or (2) if said States fail to ratify the said compact within six months from the date of the passage of this Act then, until six of said States, including the State of California, shall ratify said compact and shall consent to waive the provisions of the first paragraph of Article XI of said compact, which makes the same binding and obligatory only when approved by each of the seven States signatory thereto, and shall have approved said compact without conditions, save that of such six-State approval, and the President by public proclamation shall have so declared, and, further, until the State of California, by act of its legislature, shall agree irrevocably and unconditionally with the United States and for the benefit of the States of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, as an express covenant and in consideration of the passage of this Act, that the aggregate annual consumptive use (diversions less returns to the river) of water of and from the Colorado River for use in the State of California, including all uses under contracts made under the provisions of this Act and all water necessary for the supply of any rights which may now exist, shall not exceed four million four hundred thousand acre-feet of the waters apportioned to the lower basin States by paragraph (a) of Article III of the Colorado River compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact, such uses always to be subject to the terms of said compact.

The States of Arizona, California, and Nevada are authorized to enter into an agreement which shall provide (1) that of the 7,500,000 acre-feet annually apportioned to the lower basin by paragraph (a) of Article III of the Colorado River compact, there shall be apportioned to the State of Nevada 300,000 acre-feet and to the State of Arizona 2,800,000 acre-feet for exclusive beneficial consumptive use in perpetuity, and (2) that the State of Arizona may annually use one-half of the excess or surplus waters unapportioned by the Colorado River compact, and (3) that the State of Arizona shall have the exclusive beneficial consumptive use of the Gila River and its tributaries within the boundaries of said State, and (4) that the waters of the Gila River and its tributaries, except return flow after the same enters the Colorado River, shall never be subject to any diminution whatever by any allowance of water which may be made by treaty or otherwise to the United

States of Mexico but if, as provided in paragraph (c) of Article III of the Colorado River compact, it shall become necessary to supply water to the United States of Mexico from waters over and above the quantities which are surplus as defined by said compact, then the State of California shall and will mutually agree with the State of Arizona to supply, out of the main stream of the Colorado River, one-half of any deficiency which must be supplied to Mexico by the lower basin, and (5) that the State of California shall and will further mutually agree with the States of Arizona and Nevada that none of said three States shall withhold water and none shall require the delivery of water, which cannot reasonably be applied to domestic and agricultural uses, and (6) that all of the provisions of said tri-State agreement shall be subject in all particulars to the provisions of the Colorado River compact, and (7) said agreement to take effect upon the ratification of the Colorado River compact by Arizona, California, and Nevada.

(b) Before any money is appropriated for the construction of said dam or power plant, or any construction work done or contracted for, the Secretary of the Interior shall make provision for revenues by contract, in accordance with the provisions of this Act, adequate in his judgment to insure payment of all expenses of operation and maintenance of said works incurred by the United States and the repayment, within fifty years from the date of the completion of said works, of all amounts advanced to the fund under subdivision (b) of section 2 for such works, together with interest thereon made reimbursable under this Act.

Before any money is appropriated for the construction of said main canal and appurtenant structures to connect the Laguna Dam with the Imperial and Coachella Valleys in California, or any construction work is done upon said canal or contracted for, the Secretary of the Interior shall make provision for revenues, by contract or otherwise, adequate in his judgment to insure payment of all expenses of construction, operation, and maintenance of said main canal and appurtenant structures in the manner provided in the reclamation law.

If during the period of amortization the Secretary of the Interior shall receive revenues in excess of the amount necessary to meet the periodical payments to the United States as provided in the contract, or contracts, executed under this Act, then, immediately after the settlement of such periodical payments, he shall pay to the State of Arizona 18¾ per centum of such excess revenues and to the State of Nevada 18¾ per centum of such excess revenues.

SEC. 5. That the Secretary of the Interior is hereby authorized, under such general regulations as he may prescribe, to contract for the storage of water in said reservoir and for the delivery thereof at such points on the river and on said canal as may be agreed upon, for irrigation and domestic uses, and generation of electrical energy and delivery at the switchboard to States, municipal corporations, political subdivisions, and private corporations of electrical energy generated at said dam, upon charges that will provide revenue which, in addition to other revenue accruing under the reclamation law and under this Act, will in his judgment cover all expenses of operation and maintenance incurred by the United States on account of works constructed under this Act and the payments to the United States under subdivision (b) of section 4. Contracts respecting water for irrigation and domestic uses shall be for permanent service and shall conform to paragraph (a) of section 4 of this Act. No person shall have or be entitled to have the use for any purpose of the water stored as aforesaid except by contract made as herein stated.

After the repayments to the United States of all money advanced with interest, charges shall be on such basis and the revenues derived therefrom shall be kept in a separate fund to be expended within the Colorado River Basin as may hereafter be prescribed by the Congress.

General and uniform regulations shall be prescribed by the said Secretary for the awarding of contracts for the sale and delivery of electrical energy, and for renewals under subdivision (b) of this section, and in making such contracts the following shall govern:

(a) No contract for electrical energy or for generation of electrical energy shall be of longer duration than fifty years from the date at which such energy is ready for delivery.

Contracts made pursuant to subdivision (a) of this section shall be made with a view to obtaining reasonable returns and shall contain provisions whereby at the end of fifteen years from the date of their execution and every ten years thereafter, there shall be readjustment of the contract, upon the demand of either

party thereto, either upward or downward as to price, as the Secretary of the Interior may find to be justified by competitive conditions at distributing points or competitive centers and with provisions under which disputes or disagreements as to interpretation or performance of such contract shall be determined either by arbitration or court proceedings, the Secretary of the Interior being authorized to act for the United States in such readjustments or proceedings.

(b) The holder of any contract for electrical energy not in default thereunder shall be entitled to a renewal thereof upon such terms and conditions as may be authorized or required under the then existing laws and regulations, unless the property of such holder dependent for its usefulness on a continuation of the contract be purchased or acquired and such holder be compensated for damages to its property, used and useful in the transmission and distribution of such electrical energy and not taken, resulting from the termination of the supply.

(c) Contracts for the use of water and necessary privileges for the generation and distribution of hydroelectric energy or for the sale and delivery of electrical energy shall be made with responsible applicants therefor who will pay the price fixed by the said Secretary with a view to meeting the revenue requirements herein provided for. In case of conflicting applications, if any, such conflicts shall be resolved by the said Secretary, after hearing, with due regard to the public interest, and in conformity with the policy expressed in the Federal Water Power Act as to conflicting applications for permits and licenses, except that preference to applicants for the use of water and appurtenant works and privileges necessary for the generation and distribution of hydroelectric energy, or for delivery at the switchboard of a hydroelectric plant, shall be given, first, to a State for the generation or purchase of electric energy for use in the State, and the States of Arizona, California, and Nevada shall be given equal opportunity as such applicants.

The rights covered by such preference shall be contracted for by such State within six months after notice by the Secretary of the Interior and to be paid for on the same terms and conditions as may be provided in other similar contracts made by said Secretary: *Provided, however,* That no application of a State or a political subdivision for an allocation of water for power purposes or of electrical energy shall be denied or another application in conflict therewith be granted on the ground that the bond issue of such State or political subdivision, necessary to enable the applicant to utilize such water and appurtenant works and privileges necessary for the generation and distribution of hydroelectric energy or the electrical energy applied for, has not been authorized or marketed, until after a reasonable time, to be determined by the said Secretary, has been given to such applicant to have such bond issue authorized and marketed.

(d) Any agency receiving a contract for electrical energy equivalent to one hundred thousand firm horsepower, or more, may, when deemed feasible by the said Secretary, from engineering and economic considerations and under general regulations prescribed by him, be required to permit any other agency having contracts hereunder for less than the equivalent of twenty-five thousand firm horsepower, upon application to the Secretary of the Interior made within sixty days from the execution of the contract of the agency the use of whose transmission line is applied for, to participate in the benefits and use of any main transmission line constructed or to be constructed by the former for carrying such energy (not exceeding, however, one-fourth the capacity of such line), upon payment by such other agencies of a reasonable share of the cost of construction, operation, and maintenance thereof.

The use is hereby authorized of such public and reserved lands of the United States as may be necessary or convenient for the construction, operation, and maintenance of main transmission lines to transmit said electrical energy.

SEC. 6. That the dam and reservoir provided for by section 1 hereof shall be used: First, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and satisfaction of present perfected rights in pursuance of Article VIII of said Colorado River compact; and third, for power. The title to said dam, reservoir, plant, and incidental works shall forever remain in the United States, and the United States shall, until otherwise provided by Congress, control, manage, and operate the same, except as

herein otherwise provided: *Provided, however,* That the Secretary of the Interior may, in his discretion, enter into contracts of lease of a unit or units of any Government-built plant, with right to generate electrical energy, or, alternatively, to enter into contracts of lease for the use of water for the generation of electrical energy as herein provided, in either of which events the provisions of section 5 of this Act relating to revenue, term, renewals, determination of conflicting applications, and joint use of transmission lines under contracts for the sale of electrical energy, shall apply.

The Secretary of the Interior shall prescribe and enforce rules and regulations conforming with the requirements of the Federal Water Power Act, so far as applicable respecting maintenance of works in condition of repair adequate for their efficient operation, maintenance of a system of accounting, control of rates and service in the absence of State regulation or interstate agreement valuation for rate-making purposes, transfers of contracts, contracts extending beyond the lease period, expropriation of excessive profits, recapture and/or emergency use by the United States of property of lessees, and penalties for enforcing regulations made under this Act of penalizing failure to comply with such regulations or with the provisions of this Act. He shall also conform with other provisions of the Federal Water Power Act and of the rules and regulations of the Federal Power Commission, which have been devised or which may be hereafter devised, for the protection of the investor and consumer.

The Federal Power Commission is hereby directed not to issue or approve any permits or licenses under said Federal Water Power Act upon or affecting the Colorado River or any of its tributaries, except the Gila River, in the States of Colorado, Wyoming, Utah, New Mexico, Nevada, Arizona, and California until this Act shall become effective as provided in section 4 herein.

SEC. 7. That the Secretary of the Interior may, in his discretion, when repayments to the United States of all money advanced, with interest, reimbursable hereunder, shall have been made, transfer the title to said canal and appurtenant structures, except the Laguna Dam and the main canal and appurtenant structures down to and including Syphon Drop, to the districts or other agencies of the United States having a beneficial interest therein in proportion to their respective capital investments under such form of organization as may be acceptable to him. The said districts or other agencies shall have the privilege at any time of utilizing by contract or otherwise such power possibilities as may exist upon said canal, in proportion to their respective contributions or obligations toward the capital cost of said canal and appurtenant structures from and including the diversion works to the point where each respective power plant may be located. The net proceeds from any power development on said canal shall be paid into the fund and credited to said districts or other agencies on their said contracts, in proportion to their rights to develop power, until the districts or other agencies using said canal shall have paid thereby and under any contract or otherwise an amount of money equivalent to the operation and maintenance expense and cost of construction thereof.

SEC. 8. (a) The United States, its permittees, licensees, and contractees, and all users and appropriators of water stored, diverted, carried, and/or distributed by the reservoir, canals, and other works herein authorized, shall observe and be subject to and controlled by said Colorado River compact in the construction, management, and operation of said reservoir, canals, and other works and the storage, diversion, delivery, and use of water for the generation of power, irrigation, and other purposes, anything in this Act to the contrary notwithstanding, and all permits, licenses, and contracts shall so provide.

(b) Also the United States, in constructing, managing, and operating the dam, reservoir, canals, and other works herein authorized, including the appropriation, delivery, and use of water for the generation of power, irrigation, or other uses, and all users of water thus delivered and all users and appropriators of waters stored by said reservoir and/or carried by said canal, including all permittees and licensees of the United States or any of its agencies, shall observe and be subject to and controlled, anything to the contrary herein notwithstanding, by the terms of such compact, if any, between the States of Arizona, California, and Nevada, or any two thereof, for the equitable division of the benefits, including power, arising from the use of water accruing to said States, subsidiary to and consistent with said Colorado River compact, which may be negotiated and approved by said States and to which Congress shall give its consent and approval on or before January 1, 1929; and the terms of any such compact concluded between said States and approved

and consented to by Congress after said date: *Provided*, That in the latter case such compact shall be subject to all contracts, if any, made by the Secretary of the Interior under section 5 hereof prior to the date of such approval and consent by Congress.

SEC. 9. All lands of the United States found by the Secretary of the Interior to be practicable of irrigation and reclamation by the irrigation works authorized herein shall be withdrawn from public entry. Thereafter, at the direction of the Secretary of the Interior, such lands shall be opened for entry, in tracts varying in size but not exceeding one hundred and sixty acres, as may be determined by the Secretary of the Interior, in accordance with the provisions of the reclamation law, and any such entryman shall pay an equitable share in accordance with the benefits received, as determined by the said Secretary, of the construction cost of said canal and appurtenant structures; said payments to be made in such installments and at such times as may be specified by the Secretary of the Interior, in accordance with the provisions of the said reclamation law, and shall constitute revenue from said project and be covered into the fund herein provided for: *Provided*, That all persons who served in the United States Army, Navy, Marine Corps, or Coast Guard during World War II, the War with Germany, the War with Spain, or in the suppression of the insurrection in the Philippines, and who have been honorably separated or discharged therefrom or placed in the Regular Army or Naval Reserve, shall have the exclusive preference right for a period of three months to enter said lands, subject, however, to the provisions of subsection (c) of section 4 of the Act of December 5, 1924 (43 Stat. 672, 702; 43 U.S.C., sec. 433); and also, so far as practicable, preference shall be given to said persons in all construction work authorized by this chapter: *Provided further*, That the above exclusive preference rights shall apply to veteran settlers on lands watered from the Gila canal in Arizona the same as to veteran settlers on lands watered from the All-American canal in California: *Provided further*, That in the event such entry shall be relinquished at any time prior to actual residence upon the land by the entryman for not less than one year, lands so relinquished shall not be subject to entry for a period of sixty days after the filing and notation of the relinquishment in the local land office, and after the expiration of said sixty-day period such lands shall be open to entry, subject to the preference in the section provided.[1]

SEC. 10. That nothing in this Act shall be construed as modifying in any manner the existing contract, dated October 23, 1918, between the United States and the Imperial Irrigation District, providing for a connection with Laguna Dam; but the Secretary of the Interior is authorized to enter into contract or contracts with the said district or other districts, persons, or agencies for the construction, in accordance with this Act, of said canal and appurtenant structures, and also for the operation and maintenance thereof, with the consent of the other users.

SEC. 11. That the Secretary of the Interior is hereby authorized to make such studies, surveys, investigations, and do such engineering as may be necessary to determine the lands in the State of Arizona that should be embraced within the boundaries of a reclamation project, heretofore commonly known and hereafter to be known as the Parker-Gila Valley reclamation project, and to recommend the most practicable and feasible method of irrigating lands within said project, or units thereof, and the cost of the same; and the appropriation of such sums of money as may be necessary for the aforesaid purposes from time to time is hereby authorized. The Secretary shall report to Congress as soon as practicable, and not later than December 10, 1931, his findings, conclusions, and recommendations regarding such project.

SEC. 12. "Political subdivision" or 'political subdivisions" as used in this Act shall be understood to include any State, irrigation or other district, municipality, or other governmental organization.

"Reclamation law" as used in this Act shall be understood to mean that certain Act of the Congress of the United States approved June 17, 1902, entitled "An Act appropriating the receipts from the sale and disposal of public land in certain States and Territories to the construction of irrigation works for the reclamation of arid lands," and the Acts amendatory thereof and supplemental thereto.

[1]As amended by act of March 6, 1946 (60 Stat. 36).

"Maintenance" as used herein shall be deemed to include in each instance provision for keeping the works in good operating condition.

"The Federal Water Power Act," as used in this Act, shall be understood to mean that certain Act of Congress of the United States approved June 10, 1920, entitled "An Act to create a Federal Power Commission; to provide for the improvement of navigation; the development of water power; the use of the public lands in relation thereto; and to repeal section 18 of the River and Harbor Appropriation Act, approved August 8, 1917, and for other purposes," and the Acts amendatory thereof and supplemental thereto.

"Domestic" whenever employed in this Act shall include water uses defined as "domestic" in said Colorado River compact.

SEC. 13. (a) The Colorado River compact signed at Santa Fe, New Mexico, November 24, 1922, pursuant to Act of Congress approved August 19, 1921, entitled "An Act to permit a compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes," is hereby approved by the Congress of the United States, and the provisions of the first paragraph of article 11 of the said Colorado River compact, making said compact binding and obligatory when it shall have been approved by the legislature of each of the signatory States, are hereby waived, and this approval shall become effective when the State of California and at least five of the other States mentioned, shall have approved or may hereafter approve said compact as aforesaid and shall consent to such waiver, as herein provided.

(b) The rights of the United States in or to waters of the Colorado River and its tributaries howsoever claimed or acquired, as well as the rights of those claiming under the United States, shall be subject to and controlled by said Colorado River compact.

(c) Also all patents, grants, contracts, concessions, leases, permits, licenses, rights-of-way, or other privileges from the United States or under its authority, necessary or convenient for the use of waters of the Colorado River or its tributaries, or for the generation or transmission of electrical energy generated by means of the waters of said river or its tributaries, whether under this Act, the Federal Water Power Act, or otherwise, shall be upon the express condition and with the express covenant that the rights of the recipients or holders thereof to waters of the river or its tributaries, for the use of which the same are necessary, convenient, or incidental, and the use of the same shall likewise be subject to and controlled by said Colorado River compact.

(d) The conditions and covenants referred to herein shall be deemed to run with the land and the right, interest, or privilege therein and water right, and shall attach as a matter of law, whether set out or referred to in the instrument evidencing any such patent, grant, contract, concession, lease, permit, license, right-of-way, or other privilege from the United States or under its authority, or not, and shall be deemed to be for the benefit of and be available to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, and the users of water therein or thereunder, by way of suit, defense, or otherwise, in any litigation respecting the waters of the Colorado River or its tributaries.

SEC. 14. This Act shall be deemed a supplement to the reclamation law, which said reclamation law shall govern the construction, operation, and management of the works herein authorized, except as otherwise herein provided.

SEC. 15. The Secretary of the Interior is authorized and directed to make investigation and public reports of the feasibility of projects for irrigation, generation of electric power, and other purposes in the States of Arizona, Nevada, Colorado, New Mexico, Utah, and Wyoming for the purpose of making such information available to said States and to the Congress, and of formulating a comprehensive scheme of control and the improvement and utilization of the water of the Colorado River and its tributaries. The sum of $250,000 is hereby authorized to be appropriated from said Colorado River Dam fund, created by section 2 of this Act, for such purposes.

SEC. 16. In furtherance of any comprehensive plan formulated hereafter for the control, improvement, and utilization of the resources of the Colorado River system and to the end that the project authorized by this Act may constitute and be administered as a unit in such control, improvement, and utilization, any commission or commissioner duly authorized under the laws of any ratifying State in that behalf shall have the right to act in an advisory capacity to and in cooperation with the Secretary of the Interior in the exercise of any authority under the provisions of sections 4, 5, and 14 of this Act, and shall have at all times access to records of all Federal agencies empowered to act under said sections, and shall be entitled to have copies of said records on request.

SEC. 17. Claims of the United States arising out of any contract authorized by this Act shall have priority over all others, secured or unsecured.

SEC. 18. Nothing herein shall be construed as interfering with such rights as the States now have either to the waters within their borders or to adopt such policies and enact such laws as they may deem necessary with respect to the appropriation, control, and use of waters within their borders, except as modified by the Colorado River compact or other interstate agreement.

SEC. 19. That the consent of Congress is hereby given to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming to negotiate and enter into compacts or agreements, supplemental to and in conformity with the Colorado River compact and consistent with this Act for a comprehensive plan for the development of the Colorado River and providing for the storage, diversion, and use of the waters of said river. Any such compact or agreement may provide for the construction of dams, headworks, and other diversion works or structures for flood control, reclamation, improvement of navigation, division of water, or other purposes and/or the construction of power houses or other structures for the purpose of the development of water power and the financing of the same; and for such purposes may authorize the creation of interstate commissions and/or the creation of corporations, authorities, or other instrumentalities.

(a) Such consent is given upon condition that a representative of the United States, to be appointed by the President, shall participate in the negotiations and shall make report to Congress of the proceedings and of any compact or agreement entered into.

(b) No such compact or agreement shall be binding or obligatory upon any of such States unless and until it has been approved by the legislature of each of such States and by the Congress of the United States.

SEC. 20. Nothing in this Act shall be construed as a denial or recognition of any rights, if any, in Mexico to the use of the waters of the Colorado River system.

SEC. 21. That the short title of this Act shall be "Boulder Canyon Project Act."

Approved, December 21, 1928.

[CHAPTER 643] 1 C.6

AN ACT

July 19, 1940
[H. R. 9877]
[Public, No. 756]

Authorizing the Secretary of the Interior to promulgate and to put into effect charges for electrical energy generated at Boulder Dam, providing for the application of revenues from said project, authorizing the operation of the Boulder Power Plant by the United States directly or through agents, and for other purposes.

Boulder Canyon Project Adjustment Act.

Promulgation of charges for electrical energy.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is hereby authorized and directed to, and he shall, promulgate charges, or the basis of computation thereof, for electrical energy generated at Boulder Dam during the period beginning June 1, 1937, and ending May 31, 1987, computed to be sufficient, together with other net revenues from the project, to accomplish the following purposes:

Purposes.

(a) To meet the cost of operation and maintenance, and to provide for replacements, of the project during the period beginning June 1, 1937, and ending May 31, 1987;

(b) To repay to the Treasury, with interest, the advances to the Colorado River Dam Fund for the project made prior to June 1, 1937, within fifty years from that date (excluding advances allocated to flood control by section 2 (b) of the Project Act, which shall be repayable as provided in section 7 hereof), and such portion of such advances made on and after June 1, 1937, as (on the basis of repayment thereof within such fifty-year period or periods as the Secretary may determine) will be repayable prior to June 1, 1987;

45 Stat. 1057.
43 U.S.C. §617a (b).

(c) To provide $600,000 for each of the years and for the purposes specified in section 2 (c) hereof; and

(d) To provide $500,000 for each of the years and for the purposes specified in section 2 (d) hereof.

Revisions, etc., of charges.

Such charges may be made subject to revisions and adjustments at such times, to such extent, and in such manner as by the terms of their promulgation the Secretary shall prescribe.

Disposition of receipts; availability.

SEC. 2. All receipts from the project shall be paid into the Colorado River Dam Fund and shall be available for:

Annual appropriation.

(a) Annual appropriation for the operation, maintenance, and replacements of the project, including emergency replacements necessary to insure continuous operations;

Repayment of advances, etc.

(b) Repayment to the Treasury, with interest (after making provision for the payments and transfers provided in subdivisions (c) and (d) hereof), of advances to the Colorado River Dam Fund for the construction of the project (excluding the amount allocated to flood control by section 2 (b) of the Project Act), and any readvances made to said fund under section 5 hereof; and

45 Stat. 1057.
43 U.S.C. §617a(b).

Payments to Arizona and Nevada.

(c) Payment subject to the provisions of section 3 hereof, in commutation of the payments now provided for the States of Arizona and Nevada in section 4 (b) of the Project Act, to each of said States of the sum of $300,000 for each year of operation, beginning with the year of operation ending May 31, 1938, and continuing annually thereafter until and including the year of operation ending May 31, 1987, and such payments for any year of operation which shall have expired at the time when this subdivision (c) shall become effective shall be due immediately, and be paid, without interest, as expeditiously as administration of this Act will permit, and each such payment

45 Stat. 1059.
43 U.S.C. §617c(b).

for subsequent years of operation shall be made on or before July 31, following the close of the year of operation for which it is made. All such payments shall be made from revenues hereafter received in the Colorado River Dam Fund.

Deductions from payments for taxes collected.

Notwithstanding the foregoing provisions of this subsection, in the event that there are levied and collected by or under authority of Arizona or Nevada or by any lawful taxing political subdivision thereof, taxes upon—

(i) the project as herein defined;

(ii) the electrical energy generated at Boulder Dam by means of facilities, machinery, or equipment both owned and operated by the United States, or owned by the United States and operated under contract with the United States;

(iii) the privilege of generating or transforming such electrical energy or of use of such facilities, machinery, or equipment or of falling water for such generation or transforming; or

(iv) the transmission or control of such electrical energy so generated or transformed (as distinguished from the transmission lines and other physical properties used for such transmission or control) or the use of such transmission lines or other physical properties for such transmission or control,

payments made hereunder to the State or by or under the authority of which such taxes are collected shall be reduced by an amount equivalent to such taxes. Nothing herein shall in anywise impair the right of either the State of Arizona or the State of Nevada, or any lawful taxing political subdivision of either of them, to collect nondiscriminatory taxes upon that portion of the transmission lines and all other physical properties, situated within such State and such political subdivision, respectively, and belonging to any of the lessees and/or allottees under the Project Act and/or under this Act, and nothing herein shall exempt or be construed so as to exempt any such property from nondiscriminatory taxation, all in the manner provided by the constitution and laws of such State. Sums, if any, received by each State under the provisions of the Project Act shall be deducted from the first payment or payments to said State authorized by this Act. Payments under this section 2 (c) shall be deemed contractual obligations of the United States, subject to the provisions of section 3 of this Act.

Right to collect nondiscriminatory taxes.

45 Stat. 1057.
43 U.S.C. §§617-617t.

Payments deemed contractual obligations of U.S.

(d) Transfer, subject to the provisions of section 3 hereof, from the Colorado River Dam Fund to a special fund in the Treasury, hereby established and designated the "Colorado River Development Fund", of the sum of $500,000 for the year of operation ending May 31, 1938, and the like sum of $500,000 for each year of operation thereafter, until and including the year of operation ending May 31, 1987. The transfer of the said sum of $500,000 for each year of operation shall be made on or before July 31, next following the close of the year of operation for which it is made: *Provided,* That any such transfer for any year of operation which shall have ended at the time this section 2 (d) shall become effective, shall be made, without interest, from revenues received in the Colorado River Dam Fund, as expeditiously as administration of this Act will permit, and without readvances from the general funds of the Treasury. Receipts of the Colorado River Development Fund for the years of operation ending in 1938, 1939, and 1940 (or in the event of reduced receipts during any of said years, due to adjustments under section 3 hereof, then the first receipts of said fund up to $1,500,000), are authorized

Transfer to Colorado River Development Fund.

Proviso.
Expeditious transfer in certain cases.

Appropriation of receipts for designated purposes authorized.

to be appropriated only for the continuation and extension, under the direction of the Secretary, of studies and investigations by the Bureau of Reclamation for the formulation of a comprehensive plan for the utilization of waters of the Colorado River system for irrigation, electrical power, and other purposes, in the States of the upper division and the States of the lower division, including studies of quantity and quality of water and all other relevant factors. The next such receipts up to and including the receipts for the year of operation ending in 1955 are authorized to be appropriated only for the investigation and construction of projects for such utilization in and equitably distributed among the four States of the upper division. Such receipts for the years of operation ending in 1956 to 1987, inclusive, are authorized to be appropriated for the investigation and construction of projects for such utilization in and equitably distributed among the States of the upper division and the States of the lower division. The terms "Colorado River system", "States of the upper division", and "States of the lower division" as so used shall have the respective meanings defined in the Colorado River compact mentioned in the Project Act. Such projects shall be only such as are found by the Secretary to be physically feasible, economically justified, and consistent with such formulation of a comprehensive plan. Nothing in this Act shall be construed so as to prevent the authorization and construction of any such projects prior to the completion of said plan of comprehensive development; nor shall this Act be construed as affecting the right of any State to proceed independently of this Act or its provisions with the investigation or construction of any project or projects. Transfers under this section 2 (d) shall be deemed contractual obligations of the United States, subject to the provisions of section 3 of this Act.

Terms defined.

45 Stat. 1057.
43 U.S.C. §§617-617t.

Transfers deemed contractual obligations of U.S.

Reduction of payments and transfers.

SEC. 3. If, by reason of any act of God, or of the public enemy, or any major catastrophe, or any other unforeseen and unavoidable cause, the revenues, for any year of operation, after making provision for costs of operation, maintenance, and the amount to be set aside for said year for replacements, should be insufficient to make the payments to the States of Arizona and Nevada and the transfers to the Colorado River Development Fund herein provided for, such payments and transfers shall be proportionately reduced, as the Secretary may find to be necessary by reason thereof.

Effective date of charges; adjustment of accounts.

SEC. 4. (a) Upon the taking effect of this Act, pursuant to section 10 hereof, the charges, or the basis of computation thereof, promulgated hereunder, shall be applicable as from June 1, 1937, and adjustments of accounts by reason thereof, including charges by and against the United States, shall be made so that the United States and all parties that have contracted for energy, or for the privilege of generating energy, at the project, shall be placed in the same position, as nearly as may be, as determined by the Secretary, that they would have occupied had such charges, or the basis of computation thereof, and the method of operation which may be provided for under section 9 hereof, been effective on June 1, 1937: *Provided*, That such adjustments with contractors shall not be made in cash, but shall be made by means of credits extended over such period as the Secretary may determine.

Proviso.
Adjustments with contractors by means of credits.

Adjustments with allottees for taxes paid.

(b) In the event payments to the States of Arizona and Nevada, or either of them, under section 2 (c) hereof, shall be reduced by reason of the collection of taxes mentioned in said section, adjustments shall be made, from time to time, with each allottee which shall have paid any such taxes, by credits, or otherwise, for that portion of the amount of such reductions which the

amount of the payments of such taxes by such allottee bears to the total amount of such taxes collected.

Treasury readvances for replacement costs, etc., limitation.

SEC. 5. If at any time there shall be insufficient sums in the Colorado River Dam Fund to meet the cost of replacements, however necessitated, in addition to meeting the other requirements of this Act, or of regulations authorized hereby and promulgated by the Secretary, the Secretary of the Treasury, upon request of the Secretary of the Interior, shall readvance to the said fund, in amounts not exceeding, in the aggregate, moneys repaid to the Treasury pursuant to Section 2 (b) hereof, the amount required for replacements, however necessitated, in excess of the amount currently available therefor in said Colorado River Dam Fund. There is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, such sums, not exceeding said aggregate amount, as may be necessary to permit the Secretary of the Treasury to make such readvances. All such readvances shall bear interest.

Appropriation authorized.

Interest rate.

SEC. 6. Whenever by the terms of the Project Act or this Act payment of interest is provided for, and whenever interest shall enter into any computation thereunder, such interest shall be computed at the rate of 3 per centum per annum, compounded annually.

Deferment of repayment of advances for flood control.

45 Stat. 1057.
43 Stat. U.S.C. §617a(b).

SEC. 7. The first $25,000,000 of advances made to the Colorado River Dam Fund for the project shall be deemed to be the sum allocated to flood control by section 2 (b) of the Project Act and repayment thereof shall be deferred without interest until June 1, 1987, after which time such advances so allocated to flood control shall be repayable to the Treasury as the Congress shall determine.

Regulations and contracts.

SEC. 8. The Secretary is hereby authorized from time to time to promulgate such regulations and enter into such contracts as he may find necessary or appropriate for carrying out the purposes of this Act and the Project Act, as modified hereby, and, by mutual consent, to terminate or modify any such contract: *Provided, however*, That no allotment of energy to any allottee made by any rule or regulation heretofore promulgated shall be modified or changed without the consent of such allottee.

Proviso.
Consent of allottee to modification of allotment of energy.

Boulder Power Plant.
Negotiations for termination of existing lease.

SEC. 9. The Secretary is hereby authorized to negotiate for and enter into a contract for the termination of the existing lease of the Boulder Power Plant made pursuant to the Project Act, and in the event of such termination the operation and maintenance, and the making of replacements, however necessitated, of the Boulder Power Plant by the United States, directly or through such agent or agents as the Secretary may designate, is hereby authorized. The powers, duties, and rights of such agent or agents shall be provided by contract, which may include provision that questions relating to the interpretation or performance thereof may be determined to the extent provided therein, by arbitration or court proceedings. The Secretary in consideration of such termination of such existing lease is authorized to agree (a) that the lessees therein named shall be designated as the agents of the United States for the operation of said power plant; (b) that (except by mutual consent or in accordance with such provisions for termination for default as may be specified therein) such agency contract shall not be revocable or terminable; and (c) that suits or proceedings to restrain the termination of any such agency contract, otherwise than as therein provided, or for other appropriate equitable relief or remedies, may be maintained against the Secretary. Suits or other court proceedings pursuant to the foregoing provisions may be maintained in, and jurisdiction to hear and determine such

Court jurisdiction.

suits or proceedings and to grant such relief or remedies is hereby conferred upon, the District Court of the United States for the District of Columbia, with the like right of appeal or review as in other like suits or proceedings in said court. The Secretary is hereby authorized to act for the United States in such arbitration proceedings.

Effective date of Act.

SEC. 10. This Act shall be effective immediately for the purpose of the promulgation of charges, or the basis of computation thereof, and the execution of contracts authorized by the terms of this Act, but neither such charges, nor the basis of computation thereof, nor any such contract, shall be effective unless and until this Act shall be effective for all purposes. This Act shall take effect for all purposes when, but not before, the Secretary shall have found that provision has been made for the termination of the existing lease of the Boulder Power Plant and for the operation thereof as authorized by section 9 hereof, and that allottees obligated under contracts in force on the date of enactment of this Act to pay for at least 90 per centum of the firm energy shall have entered into contracts (1) consenting to such operation, and (2) containing such other provisions as the Secretary may deem necessary or proper for carrying out the purposes of this Act. For purposes of this section such 90 per centum shall be computed as of the end of the absorption periods provided for in regulations heretofore promulgated by the Secretary and in effect at the time of the enactment of this Act.

Act to become inoperative if specified contracts not entered into.

If contracts in accordance with the requirements of this section shall not have been entered into prior to June 1, 1941, this Act shall cease to be operative and shall be of no further force or effect.

Refusal, etc., of contractor to execute modifying contract, effect.

SEC. 11. Any contractor for energy from the project failing or refusing to execute a contract modifying its existing contract to conform to this Act shall continue to pay the rates and charges provided for in its existing contract, subject to such periodic readjustments as are therein provided, in all respects as if this Act had not been passed, and so far as necessary to support such existing contract all of the provisions of the Project Act shall remain in effect, anything in this Act inconsistent therewith notwithstanding.

45 Stat. 1057.
43 U.S.C. §§617-617t.

Definitions.

SEC. 12. The following terms wherever used in this Act shall have the following respective meanings:

"Project Act."

"Project Act" shall mean the Boulder Canyon Project Act;

"Project."

"Project" shall mean the works authorized by the Project Act to be constructed and owned by the United States, exclusive of the main canal and appurtenances mentioned therein, now known as the All-American Canal;

"Secretary."

"Secretary" shall mean the Secretary of the Interior of the United States;

"Firm energy," "allottees."

"Firm energy" and "allottees" shall have the meaning assigned to such terms in regulations heretofore promulgated by the Secretary and in effect at the time of the enactment of this Act;

"Replacements."

"Replacements" shall mean such replacements as may be necessary to keep the project in good operating condition during the period from June 1, 1937, to May 31, 1987, inclusive, but shall not include (except where used in conjunction with the word "emergency" or the words "however necessitated") replacements made necessary by any act of God, or of the public enemy, or by any major catastrophe; and

"Year of operation."

"Year of operation" shall mean the period from and including June 1 of any calendar year to and including May 31 of the following calendar year.

Report, etc., to Congress.

SEC. 13. The Secretary of the Interior shall, in January of each year, submit to the Congress a financial statement and a complete report of operations under this Act during the preceding year of operation as herein defined.

Noninterference with designated State rights, etc.

SEC. 14. Nothing herein shall be construed as interfering with such rights as the States now have either to the waters within their borders or to adopt such policies and enact such laws as they may deem necessary with respect to the appropriation, control, and use of waters within their borders, except as modified by the Colorado River compact or other interstate agreement. Neither the promulgation of charges, or the basis of charges, nor anything contained in this Act, or done thereunder, shall in anywise affect, limit, or prejudice any right of any State in or to the waters of the Colorado River system under the Colorado River compact. Sections 13 (b), 13 (c), and 13 (d) of the Project Act and all other provisions of said Project Act not inconsistent with the terms of this Act shall remain in full force and effect.

45 Stat. 1064.
43 U.S.C. §617*l*(b),(c),(d).

Wage rates for laborers, etc.

SEC. 15. All laborers and mechanics employed in the construction of any part of the project, or in the operation, maintenance, or replacement of any part of the Boulder Dam, shall be paid not less than the prevailing rate of wages or compensation for work of a similar nature prevailing in the locality of the project. In the event any dispute arises as to what are the prevailing rates, the determination thereof shall be made by the Secretary of the Interior, and his decision, subject to the concurrence of the Secretary of Labor, shall be final.

Short title.

SEC. 16. This Act may be cited as "Boulder Canyon Project Adjustment Act".

Approved July 19, 1940.

1 D.1

[Item 29]

BOULDER CANYON PROJECT

AGREEMENT

REQUESTING APPORTIONMENT OF CALIFORNIA'S SHARE OF THE WATERS OF THE COLORADO RIVER AMONG THE APPLICANTS IN THE STATE

August 18, 1931

THIS AGREEMENT, made the 18th day of August, 1931, by and between Palo Verde Irrigation District, Imperial Irrigation District, Coachella Valley County Water District, Metropolitan Water District of Southern California, City of Los Angeles, City of San Diego and County of San Diego;

WITNESSETH:

WHEREAS the Secretary of the Interior did, on November 5, 1930, request of the Division of Water Resources of California, a recommendation of the proper apportionments of the water of and from the Colorado River to which California may be entitled under the provisions of the Colorado River Compact, the Boulder Canyon Project Act and other applicable legislation and regulations, to the end that the same could be carried into each and all of the contracts between the United States and applicants for water contracts in California as a uniform clause; and

WHEREAS the parties hereto have fully considered their respective rights and requirements in cooperation with the other water users and applicants and the Division of Water Resources aforesaid;

NOW, THEREFORE, the parties hereto do expressly agree to the apportionments and priorities of water of and from the Colorado River for use in California as hereinafter fully set out and respectfully request the Division of Water Resources to, in all respects, recognize said apportionments and priorites in all matters relating to State authority and to recommend the provisions of Article I hereof to the Secretary of the Interior of the United States for insertion in any and all contracts for water made by him pursuant to the terms of the Boulder Canyon Project Act, and agree that in every water contract which any party may hereafter enter into with the United States, provisions in accordance with Article I shall be included therein if agreeable to the United States.

ARTICLE I.

The waters of the Colorado River available for use within the State of California under the Colorado River Compact and the Boulder Canyon Project Act shall be apportioned to the respective interests below named and in amounts and with priorities therein named and set forth, as follows:

SECTION 1. A first priority to Palo Verde Irrigation District for beneficial use exclusively upon lands in said District as it now exists and upon lands between said District and the Colorado River, aggregating (within and without said District) a gross area of 104,500 acres, such waters as may be required by said lands.

SECTION 2. A second priority to Yuma Project of United States Bureau of Reclamation for beneficial use upon not exceeding a gross area of 25,000 acres of land located in said project in California, such waters as may be required by said lands.

SECTION 3. A third priority (a) to Imperial Irrigation District and other lands under or that will be served from the All American Canal in Imperial and Coachella Valleys, and (b) to Palo Verde Irrigation District for use exclusively on 16,000 acres in that area known as the "Lower Palo Verde Mesa", adjacent to Palo Verde

Irrigation District, for beneficial consumptive use, 3,850,000 acre feet of water per annum less the beneficial consumptive use under the priorities designated in Sections 1 and 2 above. The rights designated (a) and (b) in this section are equal in priority. The total beneficial consumptive use under priorities stated in Sections 1, 2 and 3 of this article shall not exceed 3,850,000 acre feet of water per annum.

SECTION 4. A fourth priority to the Metropolitan Water District of Southern California and/or the City of Los Angeles, for beneficial consumptive use, by themselves and/or others, on the Coastal Plain of Southern California, 550,000 acre feet of water per annum.

SECTION 5. A fifth priority, (a) to The Metropolitan Water District of Southern California and/or the City of Los Angeles, for beneficial consumptive use, by themselves and/or others, on the Coastal Plain of Southern California, 550,000 acre feet of water per annum and (b) to the City of San Diego and/or County of San Diego, for beneficial consumptive use, 112,000 acre feet of water per annum. The rights designated (a) and (b) in this section are equal in priority.

SECTION 6. A sixth priority (a) to Imperial Irrigation District and other lands under or that will be served from the All American Canal in Imperial and Coachella Valleys, and (b) to Palo Verde Irrigation District for use exclusively on 16,000 acres in that area known as the "Lower Palo Verde Mesa," adjacent to Palo Verde Irrigation District, for beneficial consumptive use, 300,000 acre feet of water per annum. The rights designated (a) and (b) in this section are equal in priority.

SECTION 7. A seventh priority of all remaining water available for use within California, for agricultural use in the Colorado River Basin in California, as said basin is designated on Map No. 23000 of the Department of the Interior, Bureau of Reclamation.

SECTION 8. So far as the rights of the allottees named above are concerned, The Metropolitan Water District of Southern California and/or the City of Los Angeles shall have the exclusive right to withdraw and divert into its aqueduct any water in Boulder Canyon Reservoir accumulated to the individual credit of said District and/or said City (not exceeding at any one time 4,750,000 acre feet in the aggregate) by reason of reduced diversions by said District and/or said City; provided, that accumulations shall be subject to such conditions as to accumulation, retention, release and withdrawal as the Secretary of the Interior may from time to time prescribe in his discretion, and his determination thereof shall be final; provided further, that the United States of America reserves the right to make similar arrangements with users in other states without distinction in priority, and to determine the correlative relations between said District and/or said City and such users resulting therefrom.

SECTION 9. In addition, so far as the rights of the allottees named above are concerned, the City of San Diego and/or County of San Diego shall have the exclusive right to withdraw and divert into an aqueduct any water in Boulder Canyon Reservoir accumulated to the individual credit of said County and/or said County (not exceeding at any one time 250,000 acre feet in the aggregate) by reason of reduced diversions by said City and/or said County; provided, that accumulations shall be subject to such conditions as to accumulation, retention, release and withdrawal as the Secretary of the Interior may from time to time prescribe in his discretion, and his determination thereof shall be final; provided further, that the United States of America reserves the right to make similar arrangements with users in other states without distinction in priority, and to determine the correlative relations between the said City and/or said County and such users resulting therefrom.

SECTION 10. In no event shall the amounts allotted in this agreement to the Metropolitan Water District of Southern California and/or the City of Los Angeles be increased on account of inclusion of a supply for both said District and said City, and either or both may use said apportionments as may be agreed by and between said District and said City.

SECTION 11. In no event shall the amounts allotted in this agreement to the City of San Diego and/or to the County of San Diego be increased on account of inclusion of a supply for both said City and said County, and either or both may use said apportionments as may be agreed by and between said City and said County.

SECTION 12. The priorities hereinbefore set forth shall be in no wise affected by the relative dates of water contracts executed by the Secretary of the Interior with the various parties.

ARTICLE II.

That each and every party hereto who has heretofore filed an application or applications for a permit or permits to appropriate water from the Colorado River requests the Division of Water Resources to amend such application or applications as far as possible to bring it or them into conformity with the provisions of this agreement; and each and every party hereto who has heretofore filed a protest or protests against any such application or applications of other parties hereto does hereby request withdrawal of such protest or protests against such application or applications when so amended.

ARTICLE III.

That each and all of the parties to this agreement respectively request that the contract for delivery of water between The United States of America and The Metropolitan Water District of Southern California under date of April 24, 1930, be amended in conformity with Article I hereof.

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be executed by their respective officers thereunto duly authorized, the day and year first above written. Executed in seven originals.

Recommended for Execution:

PALO VERDE IRRIGATION DISTRICT,
By ED J. WILLIAMS,
ARVIN B. SHAW, JR.

IMPERIAL IRRIGATION DISTRICT,
By MARK ROSE,
CHAS. L. CHILDERS,
M. J. DOWD.

COACHELLA VALLEY COUNTY WATER DISTRICT,
By THOS. C. YAGER.

METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA,
By W. B. MATTHEWS,
C. C. ELDER.

WATER CONTRACTS

CITY OF LOS ANGELES,
By W. W. HURLBUT,
C. A. DAVIS.

CITY OF SAN DIEGO,
By C. L. BYERS,
H. N. SAVAGE.

COUNTY OF SAN DIEGO,
By H. N. SAVAGE,
C. L. BYERS.

TREATY SERIES 994 1 F.1

TREATY SERIES 994

UTILIZATION OF WATERS OF THE COLORADO AND TIJUANA RIVERS AND OF THE RIO GRANDE

✦

TREATY
BETWEEN THE UNITED STATES OF AMERICA
AND MEXICO

Signed at Washington February 3, 1944.

AND

PROTOCOL

Signed at Washington November 14, 1944.

Ratification advised by the Senate of the United States of America April 18, 1945, subject to certain understandings.
Ratified by the President of the United States of America November 1, 1945, subject to said understandings.
Ratified by Mexico October 16, 1945.
Ratifications exchanged at Washington November 8, 1945.
Proclaimed by the President of the United States of America November 27, 1945, subject to said understandings.
Effective November 8, 1945.

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1946

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

WHEREAS a treaty between the United States of America and the United Mexican States relating to the utilization of the waters of the Colorado and Tijuana Rivers, and of the Rio Grande (Rio Bravo) from Fort Quitman, Texas, to the Gulf of Mexico, was signed by their respective Plenipotentiaries in Washington on February 3, 1944, and a protocol supplementary to the said treaty was signed by their respective Plenipotentiaries in Washington on November 14, 1944, the originals of which treaty and protocol, in the English and Spanish languages, are word for word as follows:

The Government of the United States of America and the Government of the United Mexican States: animated by the sincere spirit of cordiality and friendly cooperation which happily governs the relations between them; taking into account the fact that Articles VI and VII of the Treaty of Peace, Friendship and Limits between the United States of America and the United Mexican States signed at Guadalupe Hidalgo on February 2, 1848, [1] and Article IV of the boundary treaty between the two countries signed at the City of Mexico December 30, 1853 [2] regulate the use of the waters of the Rio Grande (Rio Bravo) and the Colorado River for purposes of navigation only; considering that the utilization of these waters for other purposes is desirable in the interest of both countries, and desiring, moreover, to fix and delimit the rights of the two countries with respect to the waters of the Colorado and Tijuana Rivers, and of the Rio Grande (Rio Bravo) from Fort Quitman, Texas, United States of America, to the Gulf of Mexico, in order to obtain the most complete and satisfactory utilization thereof, have resolved to conclude a treaty and for this purpose have named as their plenipotentiaries:

The President of the United States of America:

Los Gobiernos de los Estados Unidos de América y de los Estados Unidos Mexicanos: animados por el franco espíritu de cordialidad y de amistosa cooperación que felizmente norma sus relaciones; tomando en cuenta que los Artículos VI y VII del Tratado de Paz, Amistad y Límites entre los Estados Unidos de América y los Estados Unidos Mexicanos, firmado en Guadalupe Hidalgo, el 2 de febrero de 1848, y el Artículo IV del tratado de límites entre los dos países, firmado en la ciudad de México el 30 de diciembre de 1853, reglamentan únicamente para fines de navegación el uso de las aguas de los ríos Bravo (Grande) y Colorado; considerando que a los intereses de ambos países conviene el aprovechamiento de esas aguas en otros usos y consumos y deseando, por otra parte, fijar y delimitar claramente los derechos de las dos Repúblicas sobre los ríos Colorado y Tijuana y sobre el río Bravo (Grande), de Fort Quitman, Texas, Estados Unidos de América, al Golfo de México, a fin de obtener su utilización más completa y satisfactoria, han resuelto celebrar un tratado y, al efecto, han nombrado como sus plenipotenciarios:

El Presidente de los Estados Unidos de América:

[1] [Treaty Series 207; 9 Stat. 922; 18 Stat. (pt. 2, Public Treaties) 492.]

[2] [Treaty Series 208; 10 Stat. 1031; 18 Stat. (pt. 2, Public Treaties) 503.]

Cordell Hull, Secretary of State of the United States of America, George S. Messersmith, Ambassador Extraordinary and Plenipotentiary of the United States of America in Mexico, and Lawrence M. Lawson, United States Commissioner, International Boundary Commission, United States and Mexico; and.

The President of the United Mexican States:

Francisco Castillo Nájera, Ambassador Extraordinary and Plenipotentiary of the United Mexican States in Washington, and Rafael Fernández MacGregor, Mexican Commissioner, International Boundary Commission, United States and Mexico; who, having communicated to each other their respective Full Powers and having found them in good and due form, have agreed upon the following:

Al Señor Cordell Hull, Secretario de Estado de los Estados Unidos de América, al Señor George S. Messersmith, Embajador Extraordinario y Plenipotenciario de los Estados Unidos de América en México, y al Señor Ingeniero Lawrence M. Lawson, Comisionado de los Estados Unidos en la Comisión Internacional de Límites entre los Estados Unidos y México; y

El Presidente de los Estados Unidos Mexicanos:

Al Señor Dr. Francisco Castillo Nájera, Embajador Extraordinario y Plenipotenciario de los Estados Unidos Mexicanos en Wáshington, y al Señor Ingeniero Rafael Fernández MacGregor, Comisionado Mexicano en la Comisión Internacional de Límites entre los Estados Unidos y México; quienes, después de haberse comunicado sus respectivos Plenos Poderes y haberlos encontrado en buena y debida forma, convienen en lo siguiente:

I - PRELIMINARY PROVISIONS

ARTICLE 1

For the purposes of this Treaty it shall be understood that:

(a) "The United States" means the United States of America.

(b) "Mexico" means the United Mexican States.

(c) "The Commission" means the International Boundary and Water Commission, United States and Mexico, as described in Article 2 of this Treaty.

(d) "To divert" means the deliberate act of taking water from

I - DISPOSICIONES PRELIMINARES

ARTICULO 1

Para los efectos de este Tratado se entenderá:

a) Por "los Estados Unidos", los Estados Unidos de América.

b) Por "México", los Estados Unidos Mexicanos.

c) Por "La Comisión", la Comisión Internacional de Límites y Aguas entre los Estados Unidos y México, según se define en el Artículo 2 de este Tratado.

d) Por "derivar", el acto deliberado de tomar agua de cualquier

any channel in order to convey it elsewhere for storage, or to utilize it for domestic, agricultural, stock-raising or industrial purposes whether this be done by means of dams across the channel, partition weirs, lateral intakes, pumps or any other methods.

(e) "Point of diversion" means the place where the act of diverting the water is effected.

(f) "Conservation capacity of storage reservoirs" means that part of their total capacity devoted to holding and conserving the water for disposal thereof as and when required, that is, capacity additional to that provided for silt retention and flood control.

(g) "Flood discharges and spills" means the voluntary or involuntary discharge of water for flood control as distinguished from releases for other purposes.

(h) "Return flow" means that portion of diverted water that eventually finds it way back to the source from which it was diverted.

(i) "Release" means the deliberate discharge of stored water for conveyance elsewhere or for direct utilization.

(j) "Consumptive use" means the use of water by evaporation, plant transpiration or other manner whereby the water is consumed and does not return to its source of supply. In general it is measured by the amount of water

cauce con objeto de hacerla llegar a otro lugar y almacenarla, o aprovecharla con fines domésticos, agrícolas, ganaderos o industriales; ya sea que dicho acto se lleve a cabo utilizando presas construídas a través del cauce, partidores de corriente, bocatomas laterales, bombas o cualesquier otros medios.

e) Por "punto de derivación", el lugar en que se realiza el acto de derivar el agua.

f) Por "capacidad útil de las presas de almacenamiento", aquella parte de la capacidad total que se dedica a retener y conservar el agua para disponer de ella cuando sea necesario, o sea, la capacidad adicional a las destinadas al azolve y al control de avenidas.

g) Por "desfogue" y por "derrame", la salida voluntaria o involuntaria de agua para controlar las avenidas o con cualquier otro propósito que no sea de los especificados para la extracción.

h) Por "retornos", la parte de un volumen de agua derivada de una fuente de abastecimiento, que finalmente regresa a su fuente original.

i) Por "extracción", la salida del agua almacenada, deliberadamente realizada para su conducción a otro lugar o para su aprovechamiento directo.

j) Por "consumo", el agua evaporada, transpirada por las plantas, retenida o por cualquier medio perdida y que no puede retornar a su cauce de escurrimiento. En general se mide por el monto del agua derivada menos

diverted less the part thereof which returns to the stream.

(k) "Lowest major international dam or reservoir" means the major international dam or reservoir situated farthest downstream.

(l) "Highest major international dam or reservoir" means the major international dam or reservoir situated farthest upstream.

el volumen que retorna al cauce.

k) Por "presa inferior principal internacional de almacenamiento", la presa internacional principal situada más aguas abajo.

l) Por "presa superior principal internacional de almacenamiento", la presa internacional principal situada más aguas arriba.

ARTICLE 2

The International Boundary Commission established pursuant to the provisions of the Convention between the United States and Mexico signed in Washington March 1, 1889 [1] to facilitate the carrying out of the principles contained in the Treaty of November 12, 1884 [2] and to avoid difficulties occasioned by reason of the changes which take place in the beds of the Rio Grande (Rio Bravo) and the Colorado River shall hereafter be known as the International Boundary and Water Commission, United States and Mexico, which shall continue to function for the entire period during which the present Treaty shall continue in force. Accordingly, the term of the Convention of March 1, 1889 shall be considered to be indefinitely extended, and the Convention of November 21, 1900 [3] between the United States and Mexico regarding that Convention shall be considered completely terminated.

The application of the present Treaty, the regulation and exer-

ARTICULO 2

La Comisión Internacional de Límites establecida por la Convención suscrita en Wáshington, por los Estados Unidos y México, el primero de marzo de 1889, para facilitar la ejecución de los principios contenidos en el Tratado de 12 de noviembre de 1884, y para evitar las dificultades ocasionadas con motivo de los cambios que tienen lugar en el cauce de los ríos Bravo (Grande) y Colorado, cambiará su nombre por el de Comisión Internacional de Límites y Aguas, entre los Estados Unidos y México, la que continuará en funciones por todo el tiempo que el presente Tratado esté en vigor. En tal virtud se considera prorrogado indefinidamente el término de la Convención de primero de marzo de 1889 y se deroga, por completo, la de 21 de noviembre de 1900, entre los Estados Unidos y México, relativa a aquella Convención.

La aplicación del presente Tratado, la reglamentación y el ejerci-

[1] [Treaty Series 232; 26 Stat. 1512.]
[2] [Treaty Series 226; 24 Stat. 1011.]
[3] [Treaty Series 244; 31 Stat. 1936.]

cise of the rights and obligations which the two Governments assume thereunder, and the settlement of all disputes to which its observance and execution may give rise are hereby entrusted to the International Boundary and Water Commission, which shall function in conformity with the powers and limitations set forth in this Treaty.

The Commission shall in all respects have the status of an international body, and shall consist of a United States Section and a Mexican Section. The head of each Section shall be an Engineer Commissioner. Wherever there are provisions in this Treaty for joint action or joint agreement by the two Governments, or for the furnishing of reports, studies or plans to the two Governments, or similar provisions, it shall be understood that the particular matter in question shall be handled by or through the Department of State of the United States and the Ministry of Foreign Relations of Mexico.

The Commission or either of its two Sections may employ such assistants and engineering and legal advisers as it may deem necessary. Each Government shall accord diplomatic status to the Commissioner, designated by the other Government. The Commissioner, two principal engineers, a legal adviser, and a secretary, designated by each Government as members of its Section of the Commission, shall be entitled in the territory of the other country to the privileges and immuni-

cio de los derechos y el cumplimiento de las obligaciones que los dos Gobiernos adquieren en virtud del mismo, y la resolución de todos los conflictos que originen su observancia y ejecución, quedan confiados a la Comisión Internacional de Límites y Aguas que funcionará de conformidad con las facultades y restricciones que se fijan en este Tratado.

La Comisión tendrá plenamente el carácter de un organismo internacional y estará constituída por una Sección de los Estados Unidos y por una Sección Mexicana. Cada Sección será encabezada por un Comisionado Ingeniero. Cuando en este Tratado se establece acción conjunta o el acuerdo de los dos Gobiernos o la presentación a los mismos de informes, estudios o proyectos, u otras estipulaciones similares, se entenderá que dichos asuntos serán de la competencia de la Secretaría de Estado de los Estados Unidos y de la Secretaría de Relaciones Exteriores de México o que se tratarán por su conducto.

La Comisión y cada una de las Secciones que la constituyen podrán emplear a los auxiliares y consejeros técnicos, de ingeniería y legales, que estimen necesarios. Cada Gobierno reconocerá carácter diplomático al Comisionado del otro, y el Comisionado, dos ingenieros principales, un consejero legal y un secretario, designados por el otro Gobierno como miembros de su Sección de la Comisión, tendrán derecho a todos los privilegios e inmunidades pertenecientes a funcionarios diplo-

ties appertaining to diplomatic officers. The Commission and its personnel may freely carry out their observations, studies and field work in the territory of either country.

The jurisdiction of the Commission shall extend to the limitrophe parts of the Rio Grande (Rio Bravo) and the Colorado River, to the land boundary between the two countries, and to works located upon their common boundary, each Section of the Commission retaining jurisdiction over that part of the works located within the limits of its own country. Neither Section shall assume jurisdiction or control over works located within the limits of the country of the other without the express consent of the Government of the latter. The works constructed, acquired or used in fulfillment of the provisions of this Treaty and located wholly within the territorial limits of either country, although these works may be international in character, shall remain, except as herein otherwise specifically provided, under the exclusive jurisdiction and control of the Section of the Commission in whose country the works may be situated.

The duties and powers vested in the Commission by this Treaty shall be in addition to those vested in the International Boundary Commission by the Convention of March 1, 1889 and other pertinent treaties and agreements in force between the two countries except as the provisions of any of them

máticos. La Comisión y su personal podrán llevar a cabo, con toda libertad, sus observaciones, estudios y trabajos de campo en el territorio de cualquiera de los dos países.

La jurisdicción de la Comisión se ejercerá sobre los tramos limítrofes del río Bravo (Grande) y del río Colorado, sobre la línea divisoria terrestre entre los dos países y sobre las obras construídas en aquéllos y en ésta. Cada una de las Secciones tendrá jurisdicción sobre la parte de las obras situadas dentros de los límites de su nación y ninguna de ellas ejercerá jurisdicción o control sobre obras construídas o situadas dentro de los límites del país de la otra Sección sin el expreso consentimiento del Gobierno de esta última. Las obras construídas, adquiridas o usadas en cumplimiento de las disposiciones de este Tratado y que se encuentren ubicadas totalmente dentro de los límites territoriales de cualquiera de los dos países, aunque de carácter internacional, quedarán, con las excepciones expresamente señaladas en este Tratado, bajo la exclusiva jurisdicción y control de la Sección de la Comisión en cuyo país se encuentren dichas obras.

Las facultades y obligaciones que impone a la Comisión este Tratado serán adicionales a las conferidas a la Comisión Internacional de Límites por la Convención del primero de marzo de 1889 y los demás tratados y convenios pertinentes en vigor entre los dos países, con excepción de

may be modified by the present Treaty.

Each Government shall bear the expenses incurred in the maintenance of its Section of the Commission. The joint expenses, which may be incurred as agreed upon by the Commission, shall be borne equally by the two Governments.

ARTICLE 3

In matters in which the Commission may be called upon to make provision for the joint use of international waters, the following order of preferences shall serve as a guide:

1. Domestic and municipal uses.
2. Agriculture and stock-raising.
3. Electric power.
4. Other industrial uses.
5. Navigation.
6. Fishing and hunting.
7. Any other beneficial uses which may be determined by the Commission.

All of the foregoing uses shall be subject to any sanitary measures or works which may be mutually agreed upon by the two Governments, which hereby agree to give preferential attention to the solution of all border sanitation problems.

II - RIO GRANDE (RIO BRAVO)

ARTICLE 4

The waters of the Rio Grande (Rio Bravo) between Fort Quitman, Texas and the Gulf of Mexico are hereby allotted to the two countries in the following manner:

aquellas estipulaciones de cualquiera de ellos que este Tratado modifica.

Los gastos que demande el sostenimiento de cada Sección de la Comisión serán sufragados por cuenta del Gobierno del cual dependa. Los gastos comunes que acuerde la Comisión serán cubiertos por mitad por ambos Gobiernos.

ARTICULO 3

En los asuntos referentes al uso común de las aguas internacionales, acerca de los cuales deba resolver la Comisión, servirá de guía el siguiente orden de preferencias:

1°.- Usos domésticos y municipales.
2°.- Agricultura y ganadería.
3°.- Energía eléctrica.
4°.- Otros usos industriales.
5°.- Navegación.
6°.- Pesca y caza.
7°.- Cualesquiera otros usos benéficos determinados por la Comisión.

Todos los usos anteriores estarán sujetos a las medidas y obras sanitarias que convengan de común acuerdo los dos Gobiernos, los cuales se obligan a resolver preferentemente los problemas fronterizos de saneamiento.

II - RIO BRAVO (GRANDE)

ARTICULO 4

Las aguas del río Bravo (Grande) entre Fort Quitman, Texas, y el Golfo de México se asignan a los dos países de la siguiente manera:

A. To Mexico:

(a) All of the waters reaching the main channel of the Rio Grande (Rio Bravo) from the San Juan and Alamo Rivers, including the return flow from the lands irrigated from the latter two rivers.

(b) One-half of the flow in the main channel of the Rio Grande (Rio Bravo) below the lowest major international storage dam, so far as said flow is not specifically allotted under this Treaty to either of the two countries.

(c) Two-thirds of the flow reaching the main channel of the Rio Grande (Rio Bravo) from the Conchos, San Diego, San Rodrigo, Escondido and Salado Rivers and the Las Vacas Arroyo, subject to the provisions of subparagraph (c) of paragraph B of this Article.

(d) One-half of all other flows not otherwise allotted by this Article occurring in the main channel of the Rio Grande (Rio Bravo), including the contributions from all the unmeasured tributaries, which are those not named in this Article, between Fort Quitman and the lowest major international storage dam.

B. To the United States:

(a) All of the waters reaching the main channel of the Rio Grande (Rio Bravo) from the Pecos and Devils Rivers, Goodenough Spring, and Alamito, Terlingua, San Felipe and Pinto Creeks.

A. – A México:

a) La totalidad de las aguas que lleguen a la corriente principal del río Bravo (Grande), de los ríos San Juan y Alamo; comprendiendo los retornos procedentes de los terrenos que rieguen estos dos últimos ríos.

b) La mitad del escurrimiento del cauce principal del río Bravo (Grande) abajo de la presa inferior principal internacional de alamacenamiento, siempre que dicho escurrimiento no esté asignado expresamente en este Tratado a alguno de los dos países.

c) Las dos terceras partes del caudal que llegue a la corriente principal del río. Bravo (Grande) de los ríos Conchos, San Diego, San Rodrigo, Escondido y Salado y Arroyo de Las Vacas, en concordancia con lo establecido en el inciso c) del párrafo B de este Artículo.

d) La mitad de cualquier otro escurrimiento en el cauce principal del río Bravo (Grande), no asignado específicamente en este Artículo, y la mitad de las aportaciones de todos los afluentes no aforados—que son aquellos no denominados en este Artículo—entre Fort Quitman y la presa inferior principal internacional.

B. – A los Estados Unidos:

a) La totalidad de las aguas que lleguen a la corriente principal del río Bravo (Grande) procedentes de los ríos Pecos, Devils, manantial Goodenough y arroyos Alamito, Terlingua, San Felipe y Pinto.

(b) One-half of the flow in the main channel of the Rio Grande (Rio Bravo) below the lowest major international storage dam, so far as said flow is not specifically allotted under this Treaty to either of the two countries.

(c) One-third of the flow reaching the main channel of the Rio Grande (Rio Bravo) from the Conchos, San Diego, San Rodrigo, Escondido and Salado Rivers and the Las Vacas Arroyo, provided that this third shall not be less, as an average amount in cycles of five consecutive years, than 350,000 acre-feet (431,721,000 cubic meters) annually. The United States shall not acquire any right by the use of the waters of the tributaries named in this subparagraph, in excess of the said 350,000 acre-feet (431,721,000 cubic meters) annually, except the right to use one-third of the flow reaching the Rio Grande (Rio Bravo) from said tributaries, although such one-third may be in excess of that amount.

(d) One-half of all other flows not otherwise allotted by this Article occurring in the main channel of the Rio Grande (Rio Bravo), including the contributions from all the unmeasured tributaries, which are those not named in this Article, between Fort Quitman and the lowest major international storage dam.

b) La mitad del escurrimiento del cauce principal del río Bravo (Grande) abajo de la presa inferior principal internacional de almacenamiento, siempre que dicho escurrimiento no esté asignado expresamente en este Tratado a alguno de los dos países.

c) Una tercera parte del agua que llegue a la corriente principal del río Bravo (Grande) procedente de los ríos Conchos, San Diego, San Rodrigo, Escondido, Salado y Arroyo de Las Vacas; tercera parte que no será menor en conjunto, en promedio y en ciclos de cinco años consecutivos, de 431 721 000 metros cúbicos (350 000 acres pies) anuales. Los Estados Unidos no adquirirán ningún derecho por el uso de las aguas de los afluentes mencionados en este inciso en exceso de los citados 431 721 000 metros cúbicos (350 000 acres pies), salvo el derecho a usar de la tercera parte del escurrimiento que llegue al río Bravo (Grande) de dichos afluentes, aunque ella exceda del volumen aludido.

d) La mitad de cualquier otro escurrimiento en el cauce principal del río Bravo (Grande), no asignado específicamente en este Artículo, y la mitad de las aportaciones de todos los afluentes no aforados—que son aquéllos no denominados en este Artículo—entre Fort Quitman y la presa inferior principal internacional.

In the event of extraordinary drought or serious accident to the hydraulic systems on the measured Mexican tributaries, making it difficult for Mexico to make available the run-off of 350,000 acre-feet (431,721,000 cubic meters) annually, allotted in subparagraph (c) of paragraph B of this Article to the United States as the minimum contribution from the aforesaid Mexican tributaries, any deficiencies existing at the end of the aforesaid five-year cycle shall be made up in the following five-year cycle with water from the said measured tributaries.

Whenever the conservation capacities assigned to the United States in at least two of the major international reservoirs, including the highest major reservoir, are filled with waters belonging to the United States, a cycle of five years shall be considered as terminated and all debits fully paid, whereupon a new five-year cycle shall commence.

ARTICLE 5

The two Governments agree to construct jointly, through their respective Sections of the Commission, the following works in the main channel of the Rio Grande (Rio Bravo):

I. The dams required for the conservation, storage and regulation of the greatest quantity of the annual flow of the river in a way to ensure the continuance of existing uses and the development of the greatest number of feasible

En casos de extraordinaria sequía o de serio accidente en los sistemas hidráulicos de los afluentes mexicanos aforados que hagan difícil para México dejar escurrir los 431 721 000 metros cúbicos (350 000 acres pies) anuales que se asignan a los Estados Unidos como aportación mínima de los citados afluentes mexicanos, en el inciso c) del párrafo B de este Artículo, los faltantes que existieren al final del ciclo aludido de cinco años, se repondrán en el ciclo siguiente con agua procedente de los mismos tributarios.

Siempre que la capacidad útil asignada a los Estados Unidos de por lo menos dos de las presas internacionales principales, incluyendo la localizada más aguas arriba, se llene con aguas pertenecientes a los Estados Unidos, se considerará terminado un ciclo de cinco años y todos los débitos totalmente pagados, iniciándose, a partir de ese momento, un nuevo ciclo

ARTICULO 5

Los dos Gobiernos se comprometen a construir conjuntamente, por conducto de sus respectivas Secciones de la Comisión, las siguientes obras en el cauce principal del río Bravo (Grande):

I. – Las presas que se requieran para el almacenamiento y regularización de la mayor parte que sea posible del escurrimiento anual del río en forma de asegurar los aprovechamientos existentes y llevar a cabo el mayor número de

projects, within the limits imposed by the water allotments specified.

II. The dams and other joint works required for the diversion of the flow of the Rio Grande (Rio Bravo).

One of the storage dams shall be constructed in the section between Santa Helena Canyon and the mouth of the Pecos River; one in the section between Eagle Pass and Laredo, Texas (Piedras Negras and Nuevo Laredo in Mexico); and a third in the section between Laredo and Roma, Texas (Nuevo Laredo and San Pedro de Roma in Mexico). One or more of the stipulated dams may be omitted, and others than those enumerated may be built, in either case as may be determined by the Commission, subject to the approval of the two Governments.

In planning the construction of such dams the Commission shall determine:

(a) The most feasible sites;

(b) The maximum feasible reservoir capacity at each site;

(c) The conservation capacity required by each country at each site, taking into consideration the amount and regimen of its allotment of water and its contemplated uses;

(d) The capacity required for retention of silt;

(e) The capacity required for flood control.

The conservation and silt capacities of each reservoir shall be assigned to each country in the same

proyectos factibles, dentro de los límites impuestos por las asignaciones estipuladas de agua.

II. – Las presas y las otras obras comunes que se requieran para la derivación de las aguas del río Bravo (Grande).

Una de las presas de almacenamiento se construirá en el tramo entre el Cañón de Santa Elena y la desembocadura del río Pecos; otra, en el tramo comprendido entre Piedras Negras, Coahuila y Nuevo Laredo, Tamaulipas (Eagle Pass y Laredo en los Estados Unidos) y una tercera, en el tramo entre Nuevo Laredo, Tamaulipas y San Pedro de Roma, Tamaulipas (Laredo y Roma en los Estados Unidos). A juicio de la Comisión, sujeto a la aprobación de los dos Gobiernos, podrán omitirse una o más de las presas estipuladas y, en cambio, podrán construirse otras que no sean de las enumeradas.

Al planear la construcción de dichas presas, la Comisión determinará:

a) Los sitios más adecuados;

b) La máxima capacidad factible en cada sitio;

c) La capacidad útil requerida por cada país en cada sitio tomando en consideración el monto y régimen de su asignación de agua y sus usos previstos;

d) La capacidad requerida para la retención de azolves;

e) La capacidad requerida para el control de avenidas.

La capacidad útil y la requerida para la retención de azolves, serán asignadas a cada uno de los dos

proportion as the capacities required by each country in such reservoir for conservation purposes. Each country shall have an undivided interest in the flood control capacity of each reservoir.

The construction of the international storage dams shall start within two years following the approval of the respective plans by the two Governments. The works shall begin with the construction of the lowest major international storage dam, but works in the upper reaches of the river may be constructed simultaneously. The lowest major international storage dam shall be completed within a period of eight years from the date of the entry into force of this Treaty.

The construction of the dams and other joint works required for the diversion of the flows of the river shall be initiated on the dates recommended by the Commission and approved by the two Governments.

The cost of construction, operation and maintenance of each of the international storage dams shall be prorated between the two Governments in proportion to the capacity allotted to each country for conservation purposes in the reservoir at such dam.

The cost of construction, operation and maintenance of each of the dams and other joint works required for the diversion of the flows of the river shall be prorated

países en cada presa, en la misma proporción que las capacidades requeridas para almacenamiento útil, por cada país, en la misma presa. Ambos países tendrán un interés común indivisible en la capacidad de cada presa para el control de avenidas.

La construcción de las presas internacionales de almacenamiento principiará dentro de los dos años siguientes a la aprobación por los dos Gobiernos de los planos correspondientes. Los trabajos empezarán por la construcción de la presa inferior principal internacional de almacenamiento, pero se podrán llevar a cabo, simultáneamente, obras en los tramos superiores del río. La presa inferior principal internacional deberá quedar terminada en un plazo máximo de ocho años a partir de la fecha en que entre en vigor este Tratado.

La construcción de las presas y otras obras comunes requeridas para la derivación del caudal del río, se iniciará en las fechas determinadas por la Comisión y aprobadas por los dos Gobiernos.

El costo de construcción de cada una de las presas internacionales de almacenamiento y los costos de su operación y mantenimiento se dividirán entre los dos países en proporción a las respectivas capacidades útiles que en la presa de que se trate se asignen a cada uno de ellos.

El costo de construcción de cada una de las presas y de las otras obras comunes necesarias para la derivación de las aguas del río y los costos de su operación y

between the two Governments in proportion to the benefits which the respective countries receive therefrom, as determined by the Commission and approved by the two Governments.

mantenimiento, serán prorrateados entre los dos países en proporción de los beneficios que reciban, respectivamente, de cada una de dichas obras, de acuerdo con lo que determine la Comisión y aprueben los dos Gobiernos.

ARTICLE 6

The Commission shall study, investigate, and prepare plans for flood control works, where and when necessary, other than those referred to in Article 5 of this Treaty, on the Rio Grande (Rio Bravo) from Fort Quitman, Texas to the Gulf of Mexico. These works may include levees along the river, floodways and grade-control structures, and works for the canalization, rectification and artificial channeling of reaches of the river. The Commission shall report to the two Governments the works which should be built, the estimated cost thereof, the part of the works to be constructed by each Government, and the part of the works to be operated and maintained by each Section of the Commission. Each Government agrees to construct, through its Section of the Commission, such works as may be recommended by the Commission and approved by the two Governments. Each Government shall pay the costs of the works constructed by it and the costs of operation and maintenance of the part of the works assigned to it for such purpose.

ARTICULO 6

Siempre que sea necesario, la Comisión estudiará, investigará y preparará los proyectos para las obras—distintas de aquéllas a que se refiere el Artículo 5 de este Tratado—de control de las avenidas del río Bravo (Grande) desde Fort Quitman, Texas, hasta el Golfo de México. Estas obras podrán incluir bordos a lo largo del río, cauces de alivio, estructuras de control de pendiente y la canalización, rectificación o encauzamiento de algunos tramos del río. La Comisión informará a los dos Gobiernos acerca de las obras que deberán construírse, de la estimación de sus costos, de la parte de aquéllas que deberá quedar a cargo de cada uno de ellos y de la parte de las obras que deberá ser operada y mantenida por cada Sección de la Comisión. Cada Gobierno conviene en construír, por medio de su Sección de la Comisión, las obras que recomiende la Comisión y que aprueben los dos Gobiernos. Cada Gobierno pagará los costos de las obras que construya y los costos de operación y mantenimiento de la parte de las obras que se le asigne con tal objeto.

ARTICLE 7

The Commission shall study, investigate and prepare plans for

ARTICULO 7

La Comisión estudiará, investigará y preparará los proyectos

plants for generating hydro-electric energy which it may be feasible to construct at the international storage dams on the Rio Grande (Rio Bravo). The Commission shall report to the two Governments in a Minute the works which should be built, the estimated cost thereof, and the part of the works to be constructed by each Government. Each Government agrees to construct, through its Section of the Commission, such works as may be recommended by the Commission and approved by the two Governments. Both Governments, through their respective Sections of the Commission, shall operate and maintain jointly such hydro-electric plants. Each Government shall pay half the cost of the construction, operation and maintenance of such plants, and the energy generated shall be assigned to each country in like proportion.

para las plantas de generación de energía hidroeléctrica que fuere factible construír en las presas internacionales de almacenamiento en el río Bravo (Grande). La Comisión informará a los dos Gobiernos, mediante un acta, acerca de las obras que deberán construírse, de la estimación de sus costos y de la parte de aquéllas que deberá quedar a cargo de cada uno de ellos. Cada Gobierno conviene en construír, por medio de su Sección de la Comisión, las obras que le recomiende la Comisión y que aprueben los dos Gobiernos. Las plantas hidroeléctricas serán operadas y mentenidas conjuntamente por ambos Gobiernos por conducto de sus respectivas Secciones de la Comisión. Cada Gobierno pagará la mitad del costo de construcción, operación y mantenimiento de estas plantas y en la misma proporción será asignada a cada uno de los dos países la energía hidroeléctrica generada.

ARTICLE 8

The two Governments recognize that both countries have a common interest in the conservation and storage of waters in the international reservoirs and in the maximum use of these structures for the purpose of obtaining the most beneficial, regular and constant use of the waters belonging to them. Accordingly, within the year following the placing in operation of the first of the major international storage dams which is constructed, the Commission

ARTICULO 8

Los dos Gobiernos reconocen que ambos países tienen un interés común en la conservación y en el almacenamiento de las aguas en las presas internacionales y en el mejor uso de dichas presas, con objeto de obtener el más benéfico, regular y constante aprovechamiento de las aguas que les corresponden. Con tal fin, la Comisión, dentro del año siguiente de haber sido puesta en operación la primera de las presas principales internacionales que se construya,

shall submit to each Government for its approval, regulations for the storage, conveyance and delivery of the waters of the Rio Grande (Rio Bravo) from Fort Quitman, Texas to the Gulf of Mexico. Such regulations may be modified, amended or supplemented when necessary by the Commission, subject to the approval of the two Governments. The following general rules shall severally govern until modified or amended by agreement of the Commission, with the approval of the two Governments:

(a) Storage in all major international reservoirs above the lowest shall be maintained at the maximum possible water level, consistent with flood control, irrigation use and power requirements.

(b) Inflows to each reservoir shall be credited to each country in accordance with the ownership of such inflows.

(c) In any reservoir the ownership of water belonging to the country whose conservation capacity therein is filled, and in excess of that needed to keep it filled, shall pass to the other country to the extent that such country may have unfilled conservation capacity, except that one country may at its option temporarily use the conservation capacity of the other country not currently being used in any of the upper reservoirs; provided that in the event of flood discharge or spill occurring while one country is using the conserva-

someterá a la aprobación de los dos Gobiernos un reglamento para el almacenamiento, conducción y entrega de las aguas del río Bravo (Grande) desde Fort Quitman, Texas, hasta el Golfo de México. Dicha reglamentación podrá ser modificada, adicionada o complementada, cuando sea necesario, por la Comisión, con la aprobación de los dos Gobiernos. Cada una de las siguientes reglas generales regirá hasta que sean modificadas por acuerdo de la Comisión con la aprobación de los dos Gobiernos:

a) El almacenamiento de aguas en todas las presas superiores principales internacionales se mantendrá al más alto nivel que sea compatible con el control de avenidas, las extracciones normales para irrigación y los requerimientos de generación de energía eléctrica.

b) Las entradas de agua a cada presa se acreditarán al país a quien pertenezca dicha agua.

c) En cualquier vaso de almacenamiento la propiedad del agua perteneciente al país que tenga agua en exceso de la necesaria para mantener llena la capacidad útil que le corresponda, pasará al otro país, hasta que se llene la capacidad útil asignada a éste. Sin embargo, en todos los vasos de almacenamiento superiores, un país, al llenarse la capacidad útil que le pertenezca, podrá usar transitoriamente la capacidad útil del segundo país y que éste no use, siempre que, si en ese momento ocurrieren derrames y desfogues,

tion capacity of the other, all of such flood discharge or spill shall be charged to the country using the other's capacity, and all inflow shall be credited to the other country until the flood discharge or spill ceases or until the capacity of the other country becomes filled with its own water.

la totalidad de éstos se cargue al primero y todas las entradas a la presa se consideren propiedad del segundo, hasta que cesen los derrames o desfogues o hasta que la capacidad útil del segundo se llene con aguas que le pertenezcan.

(d) Reservoir losses shall be charged in proportion to the ownership of water in storage. Releases from any reservoir shall be charged to the country requesting them, except that releases for the generation of electrical energy, or other common purpose, shall be charged in proportion to the ownership of water in storage.

d) Las pérdidas que ocurran en los vasos de almacenamiento se cargarán a los dos países en proporción de los respectivos volúmenes almacenados que les pertenezcan. Las extracciones de cualquiera de los vasos se cargarán al país que las solicite, excepto las efectuadas para la generación de energía eléctrica u otro propósito común que se cargarán a cada uno de los dos países en proporción de los respectivos volúmenes almacenados que les pertenezcan.

(e) Flood discharges and spills from the upper reservoirs shall be divided in the same proportion as the ownership of the inflows occurring at the time of such flood discharges and spills, except as provided in subparagraph (c) of this Article. Flood discharges and spills from the lowest reservoir shall be divided equally, except that one country, with the consent of the Commission, may use such part of the share of the other country as is not used by the latter country.

e) Los derrames y desfogues de los vasos superiores de almacenamiento se dividirán entre los dos países en la misma proporción que guarden los volúmenes pertenecientes a cada uno de ellos de las aguas que entren a los almacenamientos durante el tiempo en que ocurran los citados derrames y desfogues, con excepción del caso previsto en el inciso c) de este Artículo. Los derrames y desfogues de la presa inferior de almacenamiento se dividirán en partes iguales entre los dos países, pero uno de ellos, con el permiso de la Comisión, podrá usar las aguas correspondientes al otro país que éste no usare.

(f) Either of the two countries may avail itself, whenever it so desires, of any water belonging to

f) Cualquiera de los dos países podrá disponer, en el momento en que lo desee, del agua almacenada

it and stored in the international reservoirs, provided that the water so taken is for direct beneficial use or for storage in other reservoirs. For this purpose the Commissioner of the respective country shall give appropriate notice to the Commission, which shall prescribe the proper measures for the opportune furnishing of the water.

ARTICLE 9

(a) The channel of the Rio Grande (Rio Bravo) may be used by either of the two countries to convey water belonging to it.

(b) Either of the two countries may, at any point on the main channel of the river from Fort Quitman, Texas to the Gulf of Mexico, divert and use the water belonging to it and may for this purpose construct any necessary works. However, no such diversion or use, not existing on the date this Treaty enters into force, shall be permitted in either country, nor shall works be constructed for such purpose, until the Section of the Commission in whose country the diversion or use is proposed has made a finding that the water necessary for such diversion or use is available from the share of that country, unless the Commission has agreed to a greater diversion or use as provided by paragraph (d) of this Article. The proposed use and the plans for the diversion works to be constructed in connection therewith shall be previously made known to the Commission for its information.

que le pertenezca en las presas internacionales, siempre que su extracción se efectúe para algún uso benéfico directo, o para ser almacenada en otra presa. Al efecto, el Comisionado respectivo dará el aviso correspondiente a la Comisión, la que dictará las medidas necesarias para el suministro oportuno del agua.

ARTICULO 9

a) El cauce del río Bravo (Grande) podrá ser empleado por los dos países para conducir el agua que les pertenezca.

b) Cualquiera de los dos países podrá derivar y usar, en cualquier lugar del cauce principal del río Bravo (Grande) desde Fort Quitman, Texas, hasta el Golfo de México, el agua que le pertenezca y podrá construir, para ello, las obras necesarias. Sin embargo, no podrá hacerse ninguna derivación o uso en cualquiera de los dos países, fuera de los existentes en la fecha en que entre en vigor este Tratado, ni construirse ningunas obras con aquel fin, hasta que la Sección de la Comisión del país en que se intente hacer la derivación o uso verifique que hay el agua necesaria para ese efecto, dentro de la asignación de ese mismo país, a menos que la Comisión haya convenido, de acuerdo con lo estipulado en el inciso d) de este Artículo, en una derivación o uso en mayor cantidad. El uso proyectado, y los planos para las correspondientes obras de derivación que deban construírse, al efecto, se darán a conocer previamente a la Comisión para su información.

(c) Consumptive uses from the main stream and from the unmeasured tributaries below Fort Quitman shall be charged against the share of the country making them.

(d) The Commission shall have the power to authorize either country to divert and use water not belonging entirely to such country, when the water belonging to the other country can be diverted and used without injury to the latter and can be replaced at some other point on the river.

(e) The Commission shall have the power to authorize temporary diversion and use by one country of water belonging to the other, when the latter does not need it or is unable to use it, provided that such authorization or the use of such water shall not establish any right to continue to divert it.

(f) In case of the occurrence of an extraordinary drought in one country with an abundant supply of water in the other country, water stored in the international storage reservoirs and belonging to the country enjoying such abundant water supply may be withdrawn, with the consent of the Commission, for the use of the country undergoing the drought.

(g) Each country shall have the right to divert from the main channel of the river any amount of water, including the water belonging to the other country, for the purpose of generating hydro-electric power, provided that such diversion causes no injury to the other country and

c) Los consumos hechos, abajo de Fort Quitman, en la corriente principal y en los afluentes no aforados, se cargarán a cuenta de la asignación del país que los efectúe.

d) La Comisión podrá autorizar que se deriven y usen aguas que no correspondan completamente al país que pretenda hacerlo, cuando el agua que pertenezca al otro país pueda ser derivada y usada sin causarle perjuicio y le sea repuesta en algún otro lugar del río.

e) La Comisión podrá autorizar la derivación y uso transitorios a favor de un país de aguas que pertenezcan al otro, cuando éste no las necesite o no las pueda utilizar y sin que dicha autorización o el uso de las citadas aguas establezca, con relación a las mismas, ningún derecho para continuar derivándolas.

f) En los casos en que concurra una extraordinaria sequía en un país con un abundante abastecimiento de agua en el otro país, el agua de éste almacenada en los vasos de almacenamiento internacionales podrá ser extraída, con el consentimiento de la Comisión, para uso del país que experimente la sequía.

g) Cada uno de los países tendrá el derecho de derivar del cauce principal del río cualquiera cantidad de agua, incluyendo el agua perteneciente al otro país, con el objeto de generar energía hidroeléctrica, siempre que tal derivación no cauce perjuicio al otro país, no interfiera con la

does not interfere with the international generation of power and that the quantities not returning directly to the river are charged against the share of the country making the diversion. The feasibility of such diversions not existing on the date this Treaty enters into force shall be determined by the Commission, which shall also determine the amount of water consumed, such water to be charged against the country making the diversion.

(h) In case either of the two countries shall construct works for diverting into the main channel of the Rio Grande (Rio Bravo) or its tributaries waters that do not at the time this Treaty enters into force contribute to the flow of the io Grande (Rio Bravo) such water shall belong to the country making such diversion.

(i) Main stream channel losses shall be charged in proportion to the ownership of water being conveyed in the channel at the times and places of the losses.

(j) The Commission shall keep a record of the waters belonging to each country and of those that may be available at a given moment, taking into account the measurement of the allotments, the regulation of the waters in storage, the consumptive uses, the withdrawals, the diversions, and the losses. For this purpose the Commission shall construct, operate and maintain on the main channel of the Rio Grande (Rio Bravo), and each Section shall

generación internacional de energía eléctrica y que los volúmenes que no retornen directamente al río sean cargados a la participación del país que hizo la derivación. La factibilidad de dichas derivaciones, que no existan al entrar en vigor este Tratado, será determinada por la Comisión, la que también fijará la cantidad de agua consumida que se cargará en cuenta de la participación del país que efectúe la derivación.

h) En el caso de que cualquiera de los dos países construya obras para decivar, hacia el cauce principal del río Bravo (Grande) o de sus tributarios, aguas que no contribuyan, en la fecha en que este Tratado entre en vigor, al escurrimiento del citado río, dicha agua pertenecerá al país que haya hecho esa derivación.

i) Las pérdidas de agua ocurridas en la corriente principal serán cargadas a cada país en proporción a los volúmenes conducidos o escurridos que le pertenezcan, en ese lugar del cauce y en el momento en que ocurran las pérdidas.

j) La Comisión llevará un registro de las aguas que pertenezcan a cada país y de aquéllas de que pueda disponer en un momento dado, teniendo en cuenta al aforo de las aportaciones, la regularización de los almacenamientos, los consumos, las extracciones, las derivaciones y las pérdidas. Al efecto, la Comisión construirá, operará y mantendrá en la corriente principal del río Bravo (Grande) y cada Sección en los correspondientes afluentes afora-

construct, operate and maintain on the measured tributaries in its own country, all the gaging stations and mechanical apparatus necessary for the purpose of making computations and of obtaining the necessary data for such record. The information with respect to the diversions and consumptive uses on the unmeasured tributaries shall be furnished to the Commission by the appropriate Section. The cost of construction of any new gaging stations located on the main channel of the Rio Grande (Rio Bravo) shall be borne equally by the two Governments. The operation and maintenance of all gaging stations or the cost of such operation and maintenance shall be apportioned between the two Sections in accordance with determinations to be made by the Commission.

dos, todas las estaciones hidrométricas y aparatos mecánicos que sean necesarios para hacer los cálculos y obtener los datos requeridos para el aludido registro. La información respecto a las derivaciones y consumos hechos en los afluentes no aforados será proporcionada por la Sección que corresponda. El costo de construcción de las estaciones hidrométricas nuevas que se localicen en el cauce principal del río Bravo (Grande) se dividirá igualmente entre los dos Gobiernos. La operación y mantenimiento, o el costo de los mismos, de todas las estaciones hidrométricas serán distribuídos entre las dos Secciones, de acuerdo con lo que determine la Comisión.

III - COLORADO RIVER

ARTICLE 10

Of the waters of the Colorado River, from any and all sources, there are allotted to Mexico:

(a) A guaranteed annual quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) to be delivered in accordance with the provisions of Article 15 of this Treaty.

(b) Any other quantities arriving at the Mexican points of diversion, with the understanding that in any year in which, as determined by the United States Section, there exists a surplus of waters of the Colorado River in excess of the amount necessary to

III - RIO COLORADO

ARTICULO 10

De las aguas del río Colorado, cualquiera que sea su fuente, se asignan a México:

a) Un volumen garantizado de 1 850 234 000 metros cúbicos (1 500 000 acres pies) cada año, que se entregará de acuerdo con lo dispuesto en el Artículo 15 de este Tratado.

b) Cualesquier otros volúmenes que lleguen a los puntos mexicanos de derivación; en la inteligencia de que, cuando a juicio de la Sección de los Estados Unidos, en cualquier año exista en el río Colorado agua en exceso de la necesaria para abastecer los con-

supply uses in the United States and the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) annually to Mexico, the United States undertakes to deliver to Mexico, in the manner set out in Article 15 of this Treaty, additional waters of the Colorado River system to provide a total quantity not to exceed 1,700,000 acre-feet (2,096,931,000 cubic meters) a year. Mexico shall acquire no right beyond that provided by this subparagraph by the use of the waters of the Colorado River system, for any purpose whatsoever, in excess of 1,500,000 acre-feet (1,850,234,000 cubic meters) annually.

In the event of extraordinary drought or serious accident to the irrigation system in the United States, thereby making it difficult for the United States to deliver the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) a year, the water allotted to Mexico under subparagraph (a) of this Article will be reduced in the same proportion as consumptive uses in the United States are reduced.

ARTICLE 11

(a) The United States shall deliver all waters allotted to Mexico wherever these waters may arrive in the bed of the limitrophe section of the Colorado River, with the exceptions hereinafter provided. Such waters shall be made up of the waters of the said river, whatever their origin, sub-

sumos en los Estados Unidos y el volumen garantizado anualmente a México de 1 850 234 000 metros cúbicos (1 500 000 acres pies), los Estados Unidos se obligan a entregar a México, según lo establecido en el Artículo 15 de este Tratado, cantidades adicionales de agua del sistema del río Colorado hasta por un volumen total que no exceda de 2 096 931 000 metros cúbicos (1 700 000 acres pies) anuales. México no adquirirá ningún derecho, fuera del que le confiere este inciso, por el uso de las aguas del sistema del río Colorado para cualquier fin, en exceso de 1 850 234 000 metros cúbicos (1 500 000 acres pies) anuales.

En los casos de extraordinaria sequía o de serio accidente al sistema de irrigación de los Estados Unidos, que haga difícil a éstos entregar la cantidad garantizada de 1 850 234 000 metros cúbicos (1 500 000 acres pies), por año, el agua asignada a México, según el inciso a) de este Artículo, se reducirá en la misma proporción en que se reduzcan los consumos en los Estados Unidos.

ARTICULO 11

a) Los Estados Unidos entregarán las aguas asignadas a México en cualquier lugar a que lleguen en el lecho del tramo limítrofe del río Colorado, con las excepciones que se citan más adelante. El volumen asignado se formará con las aguas del citado río, cualquiera que sea su fuente, con sujeción a

ject to the provisions of the following paragraphs of this Article.

(b) Of the waters of the Colorado River allotted to Mexico by subparagraph (a) of Article 10 of this Treaty, the United States shall deliver, wherever such waters may arrive in the limitrophe section of the river, 1,000,000 acre-feet (1,233,489,000 cubic meters) annually from the time the Davis dam and reservoir are placed in operation until January 1, 1980 and thereafter 1,125,000 acre-feet (1,387,675,000 cubic meters) annually, except that, should the main diversion structure referred to in subparagraph (a) of Article 12 of this Treaty be located entirely in Mexico and should Mexico so request, the United States shall deliver a quantity of water not exceeding 25,000 acre-feet (30,837,000 cubic meters) annually, unless a larger quantity may be mutually agreed upon, at a point, to be likewise mutually agreed upon, on the international land boundary near San Luis, Sonora, in which event the quantities of 1,000,000 acre-feet (1,233,489,000 cubic meters) and 1,125,000 acre-feet (1,387,675,000 cubic meters) provided hereinabove as deliverable in the limitrophe section of the river shall be reduced by the quantities to be delivered in the year concerned near San Luis, Sonora.

(c) During the period from the time the Davis dam and reservoir

las estipulaciones contenidas en los párrafos siguientes de este Artículo.

b) Del volumen de aguas del río Colorado asignado a México en el inciso a) del Artículo 10 de este Tratado, los Estados Unidos entregarán en cualquier lugar a que lleguen del tramo limítrofe del río, 1 233 489 000 metros cúbicos (1 000 000 de acres pies) de agua anualmente, desde la fecha en que se ponga en operación la presa Davis hasta el primero de enero de 1980 y, después de esta fecha, 1 387 675 000 metros cúbicos (1 125 000 acres pies) de agua cada año. Sin embargo, si la estructura principal de derivación a que se refiere el inciso a) del Artículo 12 de este Tratado quedare localizada totalmente en México, los Estados Unidos entregarán, a solicitud de México, en un lugar mutuamente determinado de la línea terrestre limítrofe cerca de San Luis, Sonora, un volumen de agua que no exceda de 30 837 000 metros cúbicos (25 000 acres pies) anualmente, a menos que se convenga en un volumen mayor. En este último caso, a los mencionados volúmenes de 1 233 489 000 metros cúbicos (1 000 000 de acres pies) y de 1 387 675 000 metros cúbicos (1 125 000 acres pies) que deberán entregarse, como se especifica arriba, en el tramo limítrofe del río, se les deducirán los volúmenes que se entreguen, cada año, cerca de San Luis, Sonora.

c) En el período comprendido entre la fecha en que la Presa

are placed in operation until January 1, 1980, the United States shall also deliver to Mexico annually, of the water allotted to it, 500,000 acre-feet (616,745,000 cubic meters), and thereafter the United States shall deliver annually 375,000 acre-feet (462,558,000 cubic meters), at the international boundary line, by means of the All-American Canal and a canal connecting the lower end of the Pilot Knob Wasteway with the Alamo Canal or with any other Mexican canal which may be substituted for the Alamo Canal. In either event the deliveries shall be made at an operating water surface elevation not higher than that of the Alamo Canal at the point where it crossed the international boundary line in the year 1943.

(d) All the deliveries of water specified above shall be made subject to the provisions of Article 15 of this Treaty.

ARTICLE 12

The two Governments agree to construct the following works:

(a) Mexico shall construct at its expense, within a period of five years from the date of the entry into force of this Treaty, a main diversion structure below the point where the northernmost part of the international land boundary line intersects the Colorado River. If such diversion structure is located in the limitrophe section of the river, its location, design and construction shall be subject to

Davis se ponga en operación y el primero de enero de 1980, los Estados Unidos entregarán anualmente a México, además, del volumen asignado a México, 616 745 000 metros cúbicos (500 000 acres pies) y, a partir de la última fecha citada, 462 558 000 metros cúbicos (375 000 acres pies) anuales, en la línea limítrofe internacional, por conducto del Canal Todo Americano y de un canal que una al extremo inferior de la descarga de Pilot Knob con el Canal del Alamo o con cualquier otro canal mexicano que lo sustituya. En ambos casos las entregas se harán a una elevación de la superficie del agua no mayor que aquélla con la que se operaba el Canal del Alamo, en el punto en que cruzaba la línea divisoria en el año de 1943.

d) Todas las entregas de agua especificadas anteriormente se sujetarán a las estipulaciones del Artículo 15 de este Tratado.

ARTICULO 12

Los dos Gobiernos se comprometen a construir las siguientes obras:

a) México construirá a sus expensas, en un plazo de cinco años contados a partir de la fecha en que entre en vigor este Tratado, una estructura principal de derivación ubicada aguas abajo del punto en que la parte más al norte de la línea divisoria internacional terrestre encuentra al río Colorado. Si dicha estructura se localizare en el tramo limítrofe del río, su ubicación, proyecto y

the approval of the Commission. The Commission shall thereafter maintain and operate the structure at the expense of Mexico. Regardless of where such diversion structure is located, there shall simultaneously be constructed such levees, interior drainage facilities and other works, or improvements to existing works, as in the opinion of the Commission shall be necessary to protect lands within the United States against damage from such floods and seepage as might result from the construction, operation and maintenance of this diversion structure. These protective works shall be constructed, operated and maintained at the expense of Mexico by the respective Sections of the Commission, or under their supervision, each within the territory of its own country.

construcción se sujetarán a la aprobación de la Comisión. Una vez construida la estructura, la Comisión la operará y mantendrá a expensas de México. Independientemente del lugar en que se localice la estructura aludida, simultáneamente se construirán los bordos, drenajes interiores y otras obras de protección y se harán las mejoras a las existentes, según la Comisión estime necesario, para proteger los terrenos ubicados dentro de los Estados Unidos de los daños que pudieran producirse a causa de avenidas y filtraciones como resultado de la construcción, operación y mantenimiento de la citada estructura de derivación. Estas obras de protección serán construidas, operadas y mantenidas, a expensas de México, por las correspondientes Secciones de la Comisión, o bajo su vigilancia, cada una dentro de su propio territorio.

(b) The United States, within a period of five years from the date of the entry into force of this Treaty, shall construct in its own territory and at its expense, and thereafter operate and maintain at its expense, the Davis storage dam and reservoir, a part of the capacity of which shall be used to make possible the regulation at the boundary of the waters to be delivered to Mexico in accordance with the provisions of Article 15 of this Treaty.

b) Los Estados Unidos construirán, a sus expensas, en su propio territorio, en un plazo de cinco años contados a partir de la fecha en que entre en vigor este Tratado, la presa de almacenamiento Davis, una parte de cuya capacidad se usará para obtener la regularización de las aguas que deben ser entregadas a México de la manera establecida en el Artículo 15 de este Tratado. La operación y mantenimiento de la misma presa serán por cuenta de los Estados Unidos.

(c) The United States shall construct or acquire in its own territory the works that may be necessary to convey a part of the

c) Los Estados Unidos construirán o adquirirán en su propio territorio las obras que fueren necesarias para hacer llegar una

waters of the Colorado River allotted to Mexico to the Mexican diversion points on the international land boundary line referred to in this Treaty. Among these works shall be included: the canal and other works necessary to convey water from the lower end of the Pilot Knob Wasteway to the international boundary, and, should Mexico request it, a canal to connect the main diversion structure referred to in subparagraph (a) of this Article, if this diversion structure should be built in the limitrophe section of the river, with the Mexican system of canals at a point to be agreed upon by the Commission on the international land boundary near San Luis, Sonora. Such works shall be constructed or acquired and operated and maintained by the United States Section at the expense of Mexico. Mexico shall also pay the costs of any sites or rights of way required for such works.

(d) The Commission shall construct, operate and maintain in the limitrophe section of the Colorado River, and each Section shall construct, operate and maintain in the territory of its own country on the Colorado River below Imperial Dam and on all other carrying facilities used for the delivery of water to Mexico, all necessary gaging stations and other measuring devices for the purpose of keeping a complete record of the waters delivered to Mexico and of the flows of the river. All data ob-

parte de las aguas del río Colorado, asignadas a México, a los puntos mexicanos de derivación en la linea divisoria internacional terrestre que se especifican en este Tratado. Entre estas obras se incluirán: el canal y las otras obras necesarias para conducir el agua desde el extremo inferior de la descarga de Pilot Knob hasta el límite internacional y, a solicitud de México, un canal que conecte la estructura principal de derivación a que se refiere el inciso a) de este Artículo, si ésta se construyere en el tramo limítrofe del río, con el sistema mexicano de canales en el punto de la línea divisoria internacional, cerca de San Luis, Sonora, en que convenga la Comisión. Las obras mencionadas serán construidas o adquiridas y operadas y mantenidas por la Sección de los Estados Unidos a expensas de México. México cubrirá también los costos de los sitios y derechos de vía requeridos para dichas obras.

d) La Comisión construirá, mantendrá y operará en el tramo limítrofe del río Colorado, y cada Sección construirá, mantendrá y operará en su territorio respectivo, en el río Colorado, aguas abajo de la presa Imperial, y en todas las otras obras usadas para entregar agua a México, las estaciones hidrométricas y dispositivos necesarios para llevar un registro completo del caudal que se entregue a México y del escurrimiento del río. Todos los datos obtenidos al respecto serán com-

tained as to such deliveries and flows shall be periodically compiled and exchanged between the two Sections.

pilados e intercambiados periódicamente por las dos Secciones.

ARTICLE 13

The Commission shall study, investigate and prepare plans for flood control on the Lower Colorado River between Imperial Dam and the Gulf of California, in both the United States and Mexico, and shall, in a Minute, report to the two Governments the works which should be built, the estimated cost thereof, and the part of the works to be constructed by each Government. The two Governments agree to construct, through their respective Sections of the Commission, such works as may be recommended by the Commission and approved by the two Governments, each Government to pay the costs of the works constructed by it. The Commission shall likewise recommend the parts of the works to be operated and maintained jointly by the Commission and the parts to be operated and maintained by each Section. The two Governments agree to pay in equal shares the cost of joint operation and maintenance, and each Government agrees to pay the cost of operation and maintenance of the works assigned to it for such purpose.

ARTICULO 13

La Comisión estudiará, investigará y preparará los proyectos para el control de las avenidas en el Bajo Río Colorado, tanto en los Estados Unidos como en México, desde la Presa Imperial hasta el Golfo de California, e informará a los dos Gobiernos, mediante un acta, acerca de las obras que deberán construírse, de la estimación de sus costos y de la parte de las obras que deberá construir cada Gobierno. Los dos Gobiernos convienen en construír, por medio de sus respectivas Secciones de la Comisión, las obras que aprueben, recomendadas por la Comisión, y en pagar los costos de las que respectivamente construyan. De la misma manera, la Comisión recomendará qué porciones de las obras deberán ser operadas y mantenidas conjuntamente por la Comisión y cuáles operadas y mantenidas por cada Sección. Los dos Gobiernos convienen en pagar por partes iguales el costo de la operación y mantenimiento conjuntos, y cada Gobierno conviene en pagar el costo de operación y mantenimiento de las obras asignadas a él con dicho objeto.

ARTICLE 14

In consideration of the use of the All-American Canal for the delivery to Mexico, in the manner provided in Articles 11 and 15 of this

ARTICULO 14

En consideración del uso del Canal Todo Americano para la entrega a México, en la forma establecida en los Artículos 11 y

Treaty, of a part of its allotment of the waters of the Colorado River, Mexico shall pay to the United States:

(a) A proportion of the costs actually incurred in the construction of Imperial Dam and the Imperial Dam-Pilot Knob section of the All-American Canal, this proportion and the method and terms of repayment to be determined by the two Governments, which, for this purpose, shall take into consideration the proportionate uses of these facilities by the two countries, these determinations to be made as soon as Davis dam and reservoir are placed in operation.

(b) Annually, a proportionate part of the total costs of maintenance and operation of such facilities, these costs to be prorated between the two countries in proportion to the amount of water delivered annually through such facilities for use in each of the two countries.

In the event that revenues from the sale of hydro-electric power which may be generated at Pilot Knob become available for the amortization of part or all of the costs of the facilities named in subparagraph (a) of this Article, the part that Mexico should pay of the costs of said facilities shall be reduced or repaid in the same proportion as the balance of the total costs are reduced or repaid. It is understood that any such revenue shall not become available until the cost of any works which may be constructed for the genera-

15 de este Tratado, de una parte de su asignación a las aguas del río Colorado, México pagará a los Estados Unidos:

a) Una parte de los costos reales de la construcción de la Presa Imperial y del tramo Imperial-Pilot Knob del Canal Todo Americano; dicha parte y la forma y términos de su pago serán determinados por los dos Gobiernos, tomando en consideración la proporción en que ambos países usarán las citadas obras. Esta determinación deberá ser hecha tan pronto como sea puesta en operación la Presa Davis.

b) Anualmente, la parte que le corresponda de los costos totales de mantenimiento y operación de aquellas obras. Dichos costos serán prorrateados entre los dos países en proporción a la cantidad de agua entregada anualmente a cada uno de ellos, para su uso, por medio de esas obras.

En el caso de que pueda disponerse de los productos de la venta de la energía hidroeléctrica que se genere en Pilot Knob para la amortización de una parte o de la totalidad de los costos de las obras enumeradas en el inciso a) de este Artículo, la parte que México deberá pagar del costo de dichas obras será reducida o reembolsada en la misma proporción en que se reduzca o reembolse el saldo insoluto de los costos totales. Queda entendido que no podrá disponerse con ese fin de esos productos de la venta de energía

tion of hydro-electric power at said location has been fully amortized from the revenues derived therefrom.

ARTICLE 15

A. The water allotted in subparagraph (a) of Article 10 of this Treaty shall be delivered to Mexico at the points of delivery specified in Article 11, in accordance with the following two annual schedules of deliveries by months, which the Mexican Section shall formulate and present to the Commission before the beginning of each calendar year:

SCHEDULE I

Schedule I shall cover the delivery, in the limitrophe section of the Colorado River, of 1,000,000 acre-feet (1,233,489,000 cubic meters) of water each year from the date Davis dam and reservoir are placed in operation until January 1, 1980 and the delivery of 1,125,000 acre-feet (1,387,675,000 cubic meters) of water each year thereafter. This schedule shall be formulated subject to the following limitations:

With reference to the 1,000,000 acre-foot (1,233,489,000 cubic meter) quantity:

(a) During the months of January, February, October, November and December the prescribed rate of delivery shall be not less than 600 cubic feet

eléctrica sino hasta que el costo de todas las obras construídas en ese lugar para generación de energía eléctrica, haya sido totalmente amortizado con los mencionados productos de la venta de la energía eléctrica.

ARTICULO 15

A. – El agua asignada en el inciso a) del Artículo 10 de este Tratado será entregada a México en los lugares especificados en el Artículo 11, de acuerdo con dos tablas anuales de entregas mensuales, que se indican a continuación, y que la Sección Mexicana formulará y presentará a la Comisión antes del principio de cada año civil:

TABLA I

La tabla I detallará la entrega en el tramo limítrofe del río Colorado de 1 233 489 000 metros cúbicos (1 000 000 de acres pies) anuales de agua, a partir de la fecha en que la Presa Davis se ponga en operación, hasta el primero de enero de 1980, y la entrega de 1 387 675 000 metros cúbicos (1 125 000 acres pies) anuales de agua después de esa fecha. Esta tabla se formulará con sujeción a las siguientes limitaciones:

Para el volumen de 1 233 489-000 metros cúbicos (1 000 000 de acres pies):

a) Durante los meses de enero, febrero, octubre, noviembre y diciembre, el gasto de entrega no será menor de 17.0 metros cúbicos (600 pies cúbicos) ni

(17.0 cubic meters) nor more than 3,500 cubic feet (99.1 cubic meters) per second.

(b) During the remaining months of the year the prescribed rate of delivery shall be not less than 1,000 cubic feet (28.3 cubic meters) nor more than 3,500 cubic feet (99.1 cubic meters) per second.

With reference to the 1,125,000 acre-foot (1,387,675,000 cubic meter) quantity:

(a) During the months of January, February, October, November and December the prescribed rate of delivery shall be not less than 675 cubic feet (19.1 cubic meters) nor more than 4,000 cubic feet (113.3 cubic meters) per second.

(b) During the remaining months of the year the prescribed rate of delivery shall be not less than 1,125 cubic feet (31.9 cubic meters) nor more than 4,000 cubic feet (113.3 cubic meters) per second.

Should deliveries of water be made at a point on the land boundary near San Luis, Sonora, as provided for in Article 11, such deliveries shall be made under a sub-schedule to be formulated and furnished by the Mexican Section. The quantities and monthly rates of deliveries under such sub-schedule shall be in proportion to those specified for Schedule I, unless otherwise agreed upon by the Commission.

mayor de 99.1 metros cúbicos (3 500 pies cúbicos) por segundo.

b) Durante los meses restantes del año, el gasto de entrega no será menor de 28.3 metros cúbicos (1 000 pies cúbicos) ni mayor de 99.1 metros cúbicos (3 500 pies cúbicos) por segundo.

Para el volumen de 1 387 675 000 metros cúbicos (1 125 000 acres pies):

a) Durante los meses de enero, febrero, octubre, noviembre y diciembre, el gasto de entrega no será menor de 19.1 metros cúbicos (675 pies cúbicos) ni mayor de 113.3 metros cúbicos (4 000 pies cúbicos) por segundo.

b) Durante los meses restantes del año, el gasto de entrega no será menor de 31.9 metros cúbicos (1 125 pies cúbicos) ni mayor de 113.3 metros cúbicos (4 000 pies cúbicos) por segundo.

En el caso en que se hagan entregas de agua en un lugar de la línea divisoria terrestre cercano a San Luis, Sonora, de acuerdo con lo establecido en el Artículo 11, dichas entregas se sujetarán a una subtabla que formulará y proporcionará la Sección Mexicana. Los volúmenes y gastos mensuales de entrega especificados en dicha subtabla estarán en proporción a los especificados para la Tabla I, salvo que la Comisión acuerde otra cosa.

SCHEDULE II

Schedule II shall cover the delivery at the boundary line by means of the All-American Canal of 500,000 acre-feet (616,745,000 cubic meters) of water each year from the date Davis dam and reservoir are placed in operation until January 1, 1980 and the delivery of 375,000 acre-feet (462,558,000 cubic meters) of water each year thereafter. This schedule shall be formulated subject to the following limitations:

With reference to the 500,000 acre-foot (616,745,000 cubic meter) quantity:

(a) During the months of January, February, October, November and December the prescribed rate of delivery shall be not less than 300 cubic feet (8.5 cubic meters) nor more than 2,000 cubic feet (56.6 cubic meters) per second.

(b) During the remaining months of the year the prescribed rate of delivery shall be not less than 500 cubic feet (14.2 cubic meters) nor more than 2,000 cubic feet (56.6 cubic meters) per second.

With reference to the 375,000 acre-foot (462,558,000 cubic meter) quantity:

(a) During the months of January, February, October, November and December the prescribed rate of delivery shall be not less than 225 cubic feet

TABLA II

La tabla II detallará la entrega en la línea divisoria de las aguas procedentes del Canal Todo Americano, de un volumen de 616 745 000 metros cúbicos (500 000 acres pies) anuales de agua a partir de la fecha en que la Presa Davis sea puesta en operación, hasta el primero de enero de 1980, y de 462 558 000 metros cúbicos (375 000 acres pies) de agua anuales después de esa fecha. Esta tabla se formulará con sujeción a las siguientes limitaciones:

Par el volumen de 616 745 000 metros cúbicos (500 000 acres pies):

a) Durante los meses de enero, febrero, octubre, noviembre y diciembre, el gasto de entrega no será menor de 8.5 metros cúbicos (300 pies cúbicos), ni mayor de 56.6 metros cúbicos (2 000 pies cúbicos) por segundo.

b) Durante los meses restantes del año, el gasto de entrega no será menor de 14.2 metros cúbicos (500 pies cúbicos), ni mayor de 56.6 metros cúbicos (2 000 pies cúbicos) por segundo.

Para el volumen de 462 558 000 metros cúbicos (375 000 acres pies):

a) Durante los meses de enero, febrero, octubre, noviembre y diciembre, el gasto de entrega no será menor de 6.4 metros cúbicos (225 pies cúbi-

(6.4 cubic meters) nor more than 1,500 cubic feet (42.5 cubic meters) per second.

(b) During the remaining months of the year the prescribed rate of delivery shall be not less than 375 cubic feet (10.6 cubic meters) nor more than 1,500 cubic feet (42.5 cubic meters) per second.

B. The United States shall be under no obligation to deliver, through the All-American Canal, more than 500,000 acre-feet (616,745,000 cubic meters) annually from the date Davis dam and reservoir are placed in operation until January 1, 1980 or more than 375,000 acre-feet (462,558,000 cubic meters) annually thereafter. If, by mutual agreement, any part of the quantities of water specified in this paragraph are delivered to Mexico at points on the land boundary otherwise than through the All-American Canal, the above quantities of water and the rates of deliveries set out under Schedule II of this Article shall be correspondingly diminished.

C. The United States shall have the option of delivering, at the point on the land boundary mentioned in subparagraph (c) of Article 11, any part or all of the water to be delivered at that point under Schedule II of this Article during the months of January, February, October, November and December of each year, from any source whatsoever, with the

cos) ni mayor de 42.5 metros cúbicos (1 500 pies cúbicos) por segundo.

b) Durante los meses restantes del año, el gasto de entrega no será menor de 10.6 metros cúbicos (375 pies cúbicos), ni mayor de 42.5 metros cúbicos (1 500 pies cúbicos) por segundo.

B. – Los Estados Unidos no estarán obligados a entregar por el Canal Todo Americano más de 616 745 000 metros cúbicos (500 000 acres pies) anuales desde la fecha en que se ponga en operación la Presa Davis hasta el primero de enero de 1980, ni más de 462 558 000 metros cúbicos (375 000 acres pies) anuales después de esa última fecha. Si por acuerdo mutuo se entregare a México cualquiera parte de los volúmenes de agua especificados en este párrafo, en puntos de la línea terrestre internacional distintos del lugar en que se haga la entrega por el Canal Todo Americano, los gastos de entrega y los volúmenes de agua arriba mencionados y determinados en la Tabla II de este Artículo, serán disminuídos en las cantidades correspondientes.

C. – Durante los meses de enero, febrero, octubre, noviembre y diciembre de cada año, los Estados Unidos tendrá la opción de entregar, en el lugar de la línea divisoria internacional determinado en el inciso c) del Artículo 11, de cualquier fuente que sea, una parte o la totalidad del volumen de agua que deberá ser entregado en ese lugar de acuerdo

understanding that the total specified annual quantities to be delivered through the All-American Canal shall not be reduced because of the exercise of this option, unless such reduction be requested by the Mexican Section, provided that the exercise of this option shall not have the effect of increasing the total amount of scheduled water to be delivered to Mexico.

D. In any year in which there shall exist in the river water in excess of that necessary to satisfy the requirements in the United States and the guaranteed quantity of 1,500,000 acre-feet (1,850,-234,000 cubic meters) allotted to Mexico, the United States hereby declares its intention to cooperate with Mexico in attempting to supply additional quantities of water through the All-American Canal as such additional quantities are desired by Mexico, if such use of the Canal and facilities will not be detrimental to the United States, provided that the delivery of any additional quantities through the All-American Canal shall not have the effect of increasing the total scheduled deliveries to Mexico. Mexico hereby declares its intention to cooperate with the United States by attempting to curtail deliveries of water through the All-American Canal in years of limited supply, if such curtailment can be accomplished without detriment to Mexico and is necessary to allow full use of all available water supplies, provided that such curtailment shall not have the effect of reduc-

con la Tabla II de este Artículo. El ejercicio de la anterior opción, no producirá la reducción de los volúmenes totales anuales especificados para ser entregados por el Canal Todo Americano, a menos que dicha reducción sea solicitada por la Sección Mexicana, ni implicará el aumento del volumen total de agua tabulada que deberá entregarse a México.

D. – En cualquier año en que haya agua en el río en exceso de la necesaria para satisfacer las demandas en los Estados Unidos y el volumen garantizado de 1 850 234 000 metros cúbicos (1 500 000 acres pies) asignado a México, los Estados Unidos declaran su intención de cooperar con México procurando abastecer, por el Canal Todo Americano, los volúmenes adicionales de agua que México desee, si ese uso del Canal y de las obras respectivas no resultare perjudicial a los Estados Unidos; en la inteligencia de que la entrega de los volúmenes adicionales de agua por el Canal Todo Americano no significará el aumento del volumen total de entregas de agua tabulado para México. Por su parte, México declara su intención de cooperar con los Estados Unidos durante los años de abastecimiento limitado tratando de reducir las entregas de agua por el Canal Todo Americano si dicha reducción pudiere llevarse a efecto sin perjuicio para México y si fuere necesaria para hacer posible el aprovechamiento total del agua disponible; en la inteligencia de que dicha reducción no tendrá el

ing the total scheduled deliveries of water to Mexico.

E. In any year in which there shall exist in the river water in excess of that necessary to satisfy the requirements in the United States and the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) allotted to Mexico, the United States Section shall so inform the Mexican Section in order that the latter may schedule such surplus water to complete a quantity up to a maximum of 1,700,000 acre-feet (2,096,931,000 cubic meters). In this circumstance the total quantities to be delivered under Schedules I and II shall be increased in proportion to their respective total quantities and the two schedules thus increased shall be subject to the same limitations as those established for each under paragraph A of this Article.

F. Subject to the limitations as to rates of deliveries and total quantities set out in Schedules I and II, Mexico shall have the right, upon thirty days notice in advance to the United States Section, to increase or decrease each monthly quantity prescribed by those schedules by not more than 20% of the monthly quantity.

G. The total quantity of water to be delivered under Schedule I of paragraph A of this Article may be increased in any year if the amount to be delivered under Schedule II

efecto de disminuir el total de entregas de agua tabulado para México.

E. – En cualquier año en que haya agua en el río en exceso de la cantidad necesaria para satisfacer las demandas en los Estados Unidos y el volumen garantizado de 1 850 234 000 metros cúbicos (1 500 000 acres pies) asignado a México, la Sección de los Estados Unidos lo informará así a la Sección Mexicana con objeto de que esta última pueda tabular las aguas excedentes hasta completar un volumen máximo de 2 096 931 000 metros cúbicos (1 700 000 acres pies). En este caso los volúmenes totales que se entregarán de acuerdo con las Tablas números I y II serán aumentados en proporción a sus respectivos volúmenes totales y las dos tablas así incrementadas quedarán sujetas a las mismas limitaciones establecidas, para cada una de ellas, en el párrafo A de este Artículo.

F. – Con sujeción a las limitaciones fijadas en las Tablas I y II por lo que toca a los gastos de entrega y a los volúmenes totales, México tendrá el derecho de aumentar o disminuir, mediante avisos dados a la Sección de los Estados Unidos con 30 días de anticipación, cada uno de los volúmenes mensuales establecidos en esas tablas, en una cantidad que no exceda del 20% de su respectivo monto.

G. – En cualquier año, el volumen total de agua que deberá entregarse de acuerdo con la Tabla I a que se refiere el párrafo A de este Artículo, podrá ser

is correspondingly reduced and if the limitations as to rates of delivery under each schedule are correspondingly increased and reduced.

aumentado, si el volumen de agua que se entregue de acuerdo con la Tabla II se redujere en el mismo volumen y si las limitaciones en cuanto a gastos de entrega estipulados para cada tabla se aumentan y se reducen correspondientemente.

IV - TIJUANA RIVER

ARTICLE 16

In order to improve existing uses and to assure any feasible further development, the Commission shall study and investigate, and shall submit to the two Governments for their approval:

(1) Recommendations for the equitable distribution between the two countries of the waters of the Tijuana River system;

(2) Plans for storage and flood control to promote and develop domestic, irrigation and other feasible uses of the waters of this system;

(3) An estimate of the cost of the proposed works and the manner in which the construction of such works or the cost thereof should be divided between the two Governments;

(4) Recommendations regarding the parts of the works to be operated and maintained by the Commission and the parts to be operated and maintained by each Section.

The two Governments through their respective Sections of the Commission shall construct such of the proposed works as are

IV - RIO TIJUANA

ARTICULO 16

Con el objeto de mejorar los usos existentes y de asegurar cualquier desarrollo futuro factible, la Comisión estudiará, investigará y someterá a los dos Gobiernos para su aprobación:

(1) Recomendaciones para la distribución equitativa entre los dos países de las aguas del sistema del río Tijuana;

(2) Proyectos de almacenamiento y control de avenidas a fin de fomentar y desarrollar los usos domésticos, de irrigación y demás usos factibles de las aguas de este sistema;

(3) Estimaciones de los costos de las obras propuestas y de la forma en que la construcción de dichas obras o los costos de las mismas deberán ser divididos entre los dos Gobiernos;

(4) Recomendaciones respecto de las partes de las obras que deberán ser operadas y mantenidas por la Comisión y las partes de las mismas que deberán ser operadas y mantenidas por cada Sección.

Los dos Gobiernos, cada uno por conducto de sus respectivas Secciones de la Comisión, construirán las obras que propongan

approved by both Governments, shall divide the work to be done or the cost thereof, and shall distribute between the two countries the waters of the Tijuana River system in the proportions approved by the two Governments. The two Governments agree to pay in equal shares the costs of joint operation and maintenance of the works involved, and each Government agrees to pay the cost of operation and maintenance of the works assigned to it for such purpose.

y aprueben ambos Gobiernos, se dividirán la cantidad de obra o su costo y se distribuirán las aguas del sistema del río Tijuana en las proporciones que ellos decidan. Los dos Gobiernos convienen en pagar por partes iguales el costo de la operación y mantenimiento conjuntos de las obras, y cada Gobierno conviene en pagar el costo de operación y mantenimiento de las obras asignadas a él con dicho objeto.

V - GENERAL PROVISIONS

ARTICLE 17

The use of the channels of the international rivers for the discharge of flood or other excess waters shall be free and not subject to limitation by either country, and neither country shall have any claim against the other in respect of any damage caused by such use. Each Government agrees to furnish the other Government, as far in advance as practicable, any information it may have in regard to such extraordinary discharges of water from reservoirs and flood flows on its own territory as may produce floods on the territory of the other.

Each Government declares its intention to operate its storage dams in such manner, consistent with the normal operations of its hydraulic systems, as to avoid, as far as feasible, material damage in the territory of the other.

V - DISPOSICIONES GENERALES

ARTICULO 17

El uso del cauce de los ríos internacionales para la descarga de aguas de avenida o de otras excedentes será libre y sin limitación para los dos países y ninguno de ellos podrá presentar reclamaciones al otro por daños causados por dicho uso. Cada uno de los Gobiernos conviene en proporcionar al otro, con la mayor anticipación posible, la información que tenga sobre las salidas de agua extraordinarias de las presas y las crecientes de los ríos que existan en su propio territorio y que pudieran producir inundaciones en el territorio del otro.

Cada Gobierno declara su intención de operar sus presas de almacenamiento en tal forma, compatible con la operación normal de sus sistemas hidráulicos, que evite, en cuanto sea factible, que se produzcan daños materiales en el territorio del otro.

ARTICLE 18

Public use of the water surface of lakes formed by international dams shall, when not harmful to the services rendered by such dams, be free and common to both countries, subject to the police regulations of each country in its territory, to such general regulations as may appropriately be prescribed and enforced by the Commission with the approval of the two Governments for the purpose of the application of the provisions of this Treaty, and to such regulations as may appropriately be prescribed and enforced for the same purpose by each Section of the Commission with respect to the areas and borders of such parts of those lakes as lie within its territory. Neither Government shall use for military purposes such water surface situated within the territory of the other country except by express agreement between the two Governments.

ARTICULO 18

El uso civil de las superficies de las aguas de los lagos de las presas internacionales, cuando no sea en detrimento de los servicios a que están destinadas dichas presas, será libre y común para ambos países, sujeto a los reglamentos de policía de cada país en su territorio, a los reglamentos generales pertinentes que establezca y ponga en vigor la Comisión con la aprobación de los dos Gobiernos con el fin de aplicar las disposiciones de este Tratado, y a los reglamentos pertinentes que establezca y ponga en vigor cada Sección de la Comisión, con el mismo fin, respecto a las áreas y orillas de aquellas partes de los lagos comprendidas dentro de su territorio. Ninguno de los dos Gobiernos podrá usar para fines militares las superficies de las aguas situadas dentro del territorio del otro país sin un convenio expreso entre los dos Gobiernos.

ARTICLE 19

The two Governments shall conclude such special agreements as may be necessary to regulate the generation, development and disposition of electric power at international plants, including the necessary provisions for the export of electric current.

ARTICULO 19

Los dos Gobiernos celebrarán los convenios especiales que sean necesarios para reglamentar la generación, el desarrollo y utilización de la energía eléctrica en las plantas internacionales y los requisitos para exportar la corriente eléctrica.

ARTICLE 20

The two Governments shall, through their respective Sections of the Commission, carry out the construction of works allotted to

ARTICULO 20

Los dos Gobiernos, por conducto de sus respectivas Secciones de la Comisión, llevarán a cabo los trabajos de construcción que les

them. For this purpose the respective Sections of the Commission may make use of any competent public or private agencies in accordance with the laws of the respective countries. With respect to such works as either Section of the Commission may have to execute on the territory of the other, it shall, in the execution of such works, observe the laws of the place where such works are located or carried out, with the exceptions hereinafter stated.

All materials, implements, equipment and repair parts intended for the construction, operation and maintenance of such works shall be exempt from import and export customs duties. The whole of the personnel employed either directly or indirectly on the construction, operation or maintenance of the works may pass freely from one country to the other for the purpose of going to and from the place of location of the works, without any immigration restrictions, passports or labor requirements. Each Government shall furnish, through its own Section of the Commission, convenient means of identification to the personnel employed by it on the aforesaid works and verification certificates covering all materials, implements, equipment and repair parts intended for the works.

Each Government shall assume responsibility for and shall adjust exclusively in accordance with its own laws all claims arising within its territory in connection with the construction, operation or

sean asignados, empleando, para ese fin, los organismos públicos o privados competentes de acuerdo con sus propias leyes. Respecto a las obras que cualquiera de las Secciones de la Comisión deba ejecutar en el territorio de la otra, observará en la ejecución del trabajo las leyes del lugar donde se efectúe, con las excepciones que en seguida se consignan.

Todos los materiales, implementos, equipos y refacciones destinados a la construcción de las obras, su operación y mantenimiento, quedarán exceptuados de tributos fiscales de importación y exportación. Todo el personal empleado directa o indirectamente en la construcción, operación y mantenimiento de las obras, podrá pasar libremente de un país al otro con objeto de ir al lugar de su trabajo, o regresar de él, sin restricciones de inmigración, pasaporte, o requisitos de trabajo. Cada Gobierno proporcionará, por medio de su respectiva Sección de la Comisión, una identificación conveniente al personal empleado por la misma en las mencionadas labores y un certificado de verificación para los materiales, implementos, equipos y refacciones destinados a las obras.

En caso de que se presenten reclamaciones en conexión con la construcción, operación o mantenimiento de la totalidad o de cualquiera parte de las obras aquí convenidas o que, en cumplimien-

maintenance of the whole or of any part of the works herein agreed upon, or of any works which may, in the execution of this Treaty, be agreed upon in the future.

ARTICLE 21

The construction of the international dams and the formation of artificial lakes shall produce no change in the fluvial international boundary, which shall continue to be governed by existing treaties and conventions in force between the two countries.

The Commission shall, with the approval of the two Governments, establish in the artificial lakes, by buoys or by other suitable markers, a practicable and convenient line to provide for the exercise of the jurisdiction and control vested by this Treaty in the Commission and its respective Sections. Such line shall also mark the boundary for the application of the customs and police regulations of each country.

ARTICLE 22

The provisions of the Convention between the United States and Mexico for the rectification of the Rio Grande (Rio Bravo) in the El Paso-Juárez Valley signed on February 1, 1933, [1] shall govern, so far as delimitation of the boundary, distribution of jurisdiction and sovereignty, and relations

to de este Tratado, se convenga en lo futuro, el Gobierno del país en cuyo territorio se hayan originado tales reclamaciones asumirá la responsabilidad de todas ellas y las ajustará de acuerdo con sus propias leyes exclusivamente.

ARTICULO 21

La construcción de las presas internacionales y la formación de sus lagos artificiales no producirá variación alguna de la línea divisoria internacional fluvial, la que continuará siendo la establecida en los tratados y convenciones vigentes entre los dos países.

La Comisión, con la aprobación de los dos Gobiernos, fijará en los lagos artificiales, por medio de boyas o por cualquier otro procedimiento que juzgue adecuado, una línea más sencilla y conveniente para los efectos prácticos del ejercicio de la jurisdicción y del control que a dicha Comisión y a cada una de sus Secciones les confiere y les impone este Tratado. La línea aludida marcará, igualmente, el límite para la aplicación de los respectivos reglamentos fiscales y de policía de los dos países.

ARTICULO 22

Las estipulaciones de la Convención entre los Estados Unidos y México, del 1°. de febrero de 1933, para la Rectificación del Río Bravo del Norte (Grande) en el Valle de Juárez-El Paso, en lo que se refiere a delimitación de fronteras, atribución de jurisdicción y soberanía y relaciones con pro-

[1] [Treaty Series 864; 48 Stat. 1621.]

with private owners are concerned, in any places where works for the artificial channeling, canalization or rectification of the Rio Grande (Rio Bravo) and the Colorado River are carried out.

ARTICLE 23

The two Governments recognize the public interest attached to the works required for the execution and performance of this Treaty and agree to acquire, in accordance with their respective domestic laws, any private property that may be required for the construction of the said works, including the main structures and their appurtenances and the construction materials therefor, and for the operation and maintenance thereof, at the cost of the country within which the property is situated, except as may be otherwise specifically provided in this Treaty.

Each Section of the Commission shall determine the extent and location of any private property to be acquired within its own country and shall make the necessary requests upon its Government for the acquisition of such property.

The Commission shall determine the cases in which it shall become necessary to locate works for the conveyance of water or electrical energy and for the servicing of any such works, for the benefit of either of the two countries, in the territory of the other country, in order that such works can be built pursuant to agreement between the two Governments.

pietarios particulares, regirán en los lugares donde se hagan las obras de encauzamiento, canalización o rectificación del río Bravo (Grande) y del río Colorado.

ARTICULO 23

Los dos Gobiernos reconocen la utilidad pública de las obras necesarias para la aplicación y cumplimiento de este Tratado y, por consiguiente, se comprometen a adquirir, de acuerdo con sus respectivas leyes internas, las propiedades privadas que se necesiten para la ejecución de las obras de referencia, comprendiendo, además de las obras principales, sus anexos y el aprovechamiento de materiales de construcción, y para la operación y mantenimiento de ellas, a expensas del país en donde se encuentren dichas propiedades, con las excepciones que expresamente establece este Tratado.

Cada una de las Secciones de la Comisión fijará en su correspondiente país la extensión y ubicación de las propiedades privadas que deban ser adquiridas y hará a su respectivo Gobierno la solicitud pertinente para que las adquiera.

La Comisión determinará los casos en que sea necesario ubicar obras para la conducción de agua o energía eléctrica y para los servicios anexos a las mismas obras, en beneficio de cualquiera de los dos países, en territorio del otro, para que dichas obras puedan construirse por acuerdo de los dos Gobiernos. Dichas obras quedarán bajo la jurisdicción y vigi-

ments. Such works shall be subject to the jurisdiction and supervision of the Section of the Commission within whose country they are located.

Construction of the works built in pursuance of the provisions of this Treaty shall not confer upon either of the two countries any rights either of property or of jurisdiction over any part whatsoever of the territory of the other. These works shall be part of the territory and be the property of the country wherein they are situated. However, in the case of any incidents occurring on works constructed across the limitrophe part of a river and with supports on both banks, the jurisdiction of each country shall be limited by the center line of such works, which shall be marked by the Commission, without thereby changing the international boundary.

Each Government shall retain, through its own Section of the Commission and within the limits and to the extent necessary to effectuate the provisions of this Treaty, direct ownership, control and jurisdiction within its own territory and in accordance with its own laws, over all real property—including that within the channel of any river—rights of way and rights *in rem*, that it may be necessary to enter upon and occupy for the construction, operation or maintenance of all the works constructed, acquired or used pursuant to this Treaty. Furthermore, each Government shall similarly acquire and retain

lancia de la Sección de la Comisión del país en que se encuentren.

La construcción de las obras, en cumplimiento de las disposiciones de este Tratado, no conferirá a ninguno de los dos países derechos ni de propiedad ni de jurisdicción sobre ninguna parte del territorio del otro. Las obras constituirán parte del territorio y pertenecerán al país dentro del cual se hallen. Sin embargo, para sucesos ocurridos sobre las obras construídas en los tramos limítrofes de los ríos y que se apoyen en ambas márgenes, la jurisdicción de cada país quedará limitada por el eje medio de dichas obras—el cual será marcado por la Comisión—sin que por eso varíe la línea divisoria internacional.

Cada Gobierno por medio de su respectiva Sección de la Comisión, conservará dentro de los límites y en la extensión necesaria para cumplir con las disposiciones de este Tratado, el dominio directo, control y jurisdicción dentro de su propio territorio y de acuerdo con sus leyes, sobre los inmuebles—incluyendo los que estén dentro del cauce del río—los derechos de vía y los derechos reales que sea necesario ocupar para la construcción, operación y mantenimiento de todas las obras que se construyan, adquieran o usen de acuerdo con este Tratado. Asimismo, cada Gobierno adquirirá y conservará en su poder, en

in its own possession the titles, control and jurisdiction over such works.

ARTICLE 24

The International Boundary and Water Commission shall have, in addition to the powers and duties otherwise specifically provided in this Treaty, the following powers and duties:

(a) To initiate and carry on investigations and develop plans for the works which are to be constructed or established in accordance with the provisions of this and other treaties or agreements in force between the two Governments dealing with boundaries and international waters; to determine, as to such works, their location, size, kind and characteristic specifications; to estimate the cost of such works; and to recommend the division of such costs between the two Governments, the arrangements for the furnishing of the necessary funds, and the dates for the beginning of the works, to the extent that the matters mentioned in this subparagraph are not otherwise covered by specific provisions of this or any other Treaty.

(b) To construct the works agreed upon or to supervise their construction and to operate and maintain such works or to supervise their operation and maintenance, in accordance with the respective domestic laws of each country. Each Section shall have, to the extent necessary to give effect to the provisions of this

la misma forma, los títulos, control y jurisdicción sobre tales obras.

ARTICULO 24

La Comisión Internacional de Límites y Aguas tendrá las siguientes facultades y obligaciones, en adición a las establecidas específicamente en este Tratado:

a) Iniciar, llevar a cabo las investigaciones y desarrollar los proyectos de las obras que deberán ser construídas o establecidas de acuerdo con las estipulaciones de éste y de los demás tratados y convenios vigentes entre los dos Gobiernos, relativos a límites y aguas internacionales; determinar la localización, magnitud, calidad y especificaciones características de dichas obras; estimar su costo; y recomendar la forma en que éste deberá repartirse entre los dos Gobiernos y los arreglos para proveer los fondos necesarios, y las fechas en que deberán principiarse las obras, en todo lo que las cuestiones mencionadas en este inciso no estén reglamentadas en forma distinta por disposiciones específicas de éste o de algún otro tratado.

b) Construir o vigilar la construcción y después operar y mantener o vigilar la operación y mantenimiento de las obras convenidas, con sujeción a las respectivas leyes de cada país. Cada Sección tendrá jurisdicción sobre las obras construídas exclusivamente en el territorio de su país, hasta el límite necesario para cum-

Treaty, jurisdiction over the works constructed exclusively in the territory of its country whenever such works shall be connected with or shall directly affect the execution of the provisions of this Treaty.

(c) In general to exercise and discharge the specific powers and duties entrusted to the Commission by this and other treaties and agreements in force between the two countries, and to carry into execution and prevent the violation of the provisions of those treaties and agreements. The authorities of each country shall aid and support the exercise and discharge of these powers and duties, and each Commissioner shall invoke when necessary the jurisdiction of the courts or other appropriate agencies of his country to aid in the execution and enforcement of these powers and duties.

(d) To settle all differences that may arise between the two Governments with respect to the interpretation or application of this Treaty, subject to the approval of the two Governments. In any case in which the Commissioners do not reach an agreement, they shall so inform their respective governments reporting their respective opinions and the grounds therefor and the points upon which they differ, for discussion and adjustment of the difference through diplomatic channels and for application where proper of the general or special agreements which the two Governments have concluded for the settlement of controversies.

plir con las disposiciones de este Tratado y siempre que dichas obras tengan conexión con las estipulaciones aludidas o alguna influencia en la ejecución de las mismas.

c) En general, ejercer las facultades y cumplir con las obligaciones específicas impuestas a la Comisión por éste y otros Tratados y Convenios vigentes entre los dos países, ejecutar sus disposiciones y evitar la violación de las mismas. Las autoridades de cada país ayudarán y apoyarán a la Comisión en el ejercicio de estas facultades, pudiendo cada Comisionado requerir, siempre que sea necesario, el imperio de los tribunales o de otras dependencias gubernamentales competentes de su país, con objeto de obtener ayuda en la ejecución y cumplimiento de estas facultades y obligaciones.

d) Resolver, con la aprobación de los dos Gobiernos, todas las diferencias que se susciten entre ellos sobre la interpretación o la aplicación del presente Tratado. Si los Comisionados no llegaren a un acuerdo, darán aviso a su Gobierno, expresando sus opiniones respectivas, los fundamentos de su decisión y los puntos en que difieran, para la discusión y ajuste de la discrepancia por la vía diplomática, o con objeto de que se apliquen, en su caso, los convenios generales o especiales celebrados entre los mismos Gobiernos para resolución de controversias.

(e) To furnish the information requested of the Commissioners jointly by the two Governments on matters within their jurisdiction. In the event that the request is made by one Government alone, the Commissioner of the other Government must have the express authorization of his Government in order to comply with such request.

e) Proporcionar las informaciones que los dos Gobiernos soliciten conjuntamente de los Comisionados sobre asuntos de su jurisdicción. En caso de que la solicitud sea hecha por un solo Gobierno, el Comisionado del otro, necesitará la autorización expresa de su Gobierno para atenderla.

(f) The Commission shall construct, operate and maintain upon the limitrophe parts of the international streams, and each Section shall severally construct, operate and maintain upon the parts of the international streams and their tributaries within the boundaries of its own country, such stream gaging stations as may be needed to provide the hydrographic data necessary or convenient for the proper functioning of this Treaty. The data so obtained shall be compiled and periodically exchanged between the two Sections.

f) La Comisión construirá, operará y mantendrá en los tramos limítrofes de las corrientes internacionales, y cada Sección construirá, operará y mantendrá separadamente en las porciones de las corrientes internacionales y de sus afluentes que queden dentro de los límites de su propio país, las estaciones de aforo que sean necesarias para obtener los datos hidrográficos necesarios o convenientes para el funcionamiento adecuado de este Tratado. Los datos así obtenidos serán recopilados e intercambiados periódicamente entre las dos Secciones.

(g) The Commission shall submit annually a joint report to the two Governments on the matters in its charge. The Commission shall also submit to the two Governments joint reports on general or any particular matters at such other times as it may deem necessary or as may be requested by the two Governments.

g) La Comisión someterá anualmente a los dos Gobiernos un informe conjunto sobre los asuntos que estén a su cargo. Asimismo, la Comisión someterá a los dos Gobiernos los informes conjuntos, generales o sobre cualquier asunto especial, cuando lo considere necesario o lo soliciten los dos Gobiernos.

ARTICLE 25

Except as otherwise specifically provided in this Treaty, Articles III and VII of the Convention of March 1, 1889 shall govern the

ARTICULO 25

Con las excepciones específicamente establecidas en este Tratado, los procedimientos de la Comisión, para la ejecución de las

proceedings of the Commission in carrying out the provisions of this Treaty. Supplementary thereto the Commission shall establish a body of rules and regulations to govern its procedure, consistent with the provisions of this Treaty and of Articles III and VII of the Convention of March 1, 1889 and subject to the approval of both Governments.

Decisions of the Commission shall be recorded in the form of Minutes done in duplicate in the English and Spanish languages, signed by each Commissioner and attested by the Secretaries, and copies thereof forwarded to each Government within three days after being signed. Except where the specific approval of the two Governments is required by any provision of this Treaty, if one of the Governments fails to communicate to the Commission its approval or disapproval of a decision of the Commission within thirty days reckoned from the date of the Minute in which it shall have been pronounced, the Minute in question and the decisions which it contains shall be considered to be approved by that Government. The Commissioners, within the limits of their respective jurisdictions, shall execute the decisions of the Commission that are approved by both Governments.

If either Government disapproves a decision of the Commission the two Governments shall take cognizance of the matter, and if an agreement regarding such matter is reached between the two Governments, the agree-

estipulaciones del mismo, se regirán por los Artículos III y VII de la Convención de primero de marzo de 1889. En adición y en concordancia con las disposiciones citadas y con las estipulaciones de este Tratado, la Comisión establecerá las normas y reglamentos que regirán, una vez aprobados por ambos Gobiernos, los procedimientos de la propia Comisión.

Los acuerdos de la Comisón se harán constar en forma de actas, levantadas por duplicado, en inglés y en español, firmadas por ambos Comisionados y bajo la fe de los Secretarios, una copia de cada una de las cuales será enviada a cada Gobierno dentro de los tres días siguientes a su firma. Excepto en los casos en que, de acuerdo con las disposiciones de este Tratado, se requiera específicamente la aprobación de los dos Gobiernos, si un Gobierno deja de comunicar a la Comisión su acuerdo aprobatorio o reprobatorio, dentro del término de 30 días contados a partir de la fecha que tenga el acta, se darán por aprobadas ésta y las resoluciones en ella contenidas. Los Comisionados ejecutarán las resoluciones de la Comisión, aprobadas por ambos Gobiernos, dentro de los límites de sus respectivas jurisdicciones.

En los casos en que cualquiera de los dos Gobiernos desapruebe un acuerdo de la Comisión, ambos Gobiernos tomarán conocimiento del asunto y, si llegaren a un acuerdo, éste se comunicará a los Comisionados con objeto de que

ment shall be communicated to the Commissioners, who shall take such further proceedings as may be necessary to carry out such agreement.

ellos sigan los procedimientos necesarios para llevar a cabo lo convenido.

VI - TRANSITORY PROVISIONS

ARTICLE 26

During a period of eight years from the date of the entry into force of this Treaty, or until the beginning of operation of the lowest major international reservoir on the Rio Grande (Rio Bravo), should it be placed in operation prior to the expiration of said period, Mexico will cooperate with the United States to relieve, in times of drought, any lack of water needed to irrigate the lands now under irrigation in the Lower Rio Grande Valley in the United States, and for this purpose Mexico will release water from El Azúcar reservoir on the San Juan River and allow that water to run through its system of canals back into the San Juan River in order that the United States may divert such water from the Rio Grande (Rio Bravo). Such releases shall be made on condition that they do not affect the Mexican irrigation system, provided that Mexico shall, in any event, except in cases of extraordinary drought or serious accident to its hydraulic works, release and make available to the United States for its use the quantities requested, under the following conditions: that during the said eight years there shall be made available a total of 160,000 acre-feet (197,358,000 cubic me-

VI - DISPOSICIONES TRANSITORIAS

ARTICULO 26

Durante un lapso de ocho años contados a partir de la fecha en que principie la vigencia de este Tratado, o hasta que sea puesta en operación la presa inferior principal internacional de almacenamiento en el río Bravo (Grande), si se pone en operación antes de aquel plazo, México cooperará con los Estados Unidos para aliviar, en períodos de escasez, la falta del agua necesaria para regar las tierras que actualmente se riegan en el valle del Bajo Río Bravo (Grande), en los Estados Unidos, y, al efecto, México extraerá agua de la presa de El Azúcar en el Río San Juan y la dejará correr por medio de su sistema de canales al río San Juan, con objeto de que los Estados Unidos puedan derivarla del río Bravo (Grande). Dichas extracciones se harán siempre que no afecten la operación del sistema de riego mexicano; sin embargo, México se obliga, salvo casos de escasez extraordinaria o de serio accidente a sus obras hidráulicas, a dejar salir y a abastecer los volúmenes pedidos por los Estados Unidos, para su uso, bajo las siguientes condiciones: que en los ocho años citados se abastecerá un total de 197 358 000 metros cúbicos (160 000 acres pies) y, en un año

ters) and up to 40,000 acre-feet (49,340,000 cubic meters) in any one year; that the water shall be made available as requested at rates not exceeding 750 cubic feet (21.2 cubic meters) per second; that when the rates of flow requested and made available have been more than 500 cubic feet (14.2 cubic meters) per second the period of release shall not extend beyond fifteen consecutive days; and that at least thirty days must elapse between any two periods of release during which rates of flow in excess of 500 cubic feet (14.2 cubic meters) per second have been requested and made available. In addition to the guaranteed flow, Mexico shall release from El Azúcar reservoir and conduct through its canal system and the San Juan River, for use in the United States during periods of drought and after satisfying the needs of Mexican users, any excess water that does not in the opinion of the Mexican Section have to be stored and that may be needed for the irrigation of lands which were under irrigation during the year 1943 in the Lower Rio Grande Valley in the United States.

determinado, un volumen hasta de 49 340 000 metros cúbicos (40 000 acres pies); que el agua se abastecerá a medida que sea solicitada y en gastos que no excedan de 21.2 metros cúbicos (750 pies cúbicos) por segundo; que cuando los gastos solicitados y abastecidos excedan de 14.2 metros cúbicos (500 pies cúbicos) por segundo, el período de extracción no se prolongará por más de 15 días consecutivos; y que deberán transcurrir cuando menos treinta días entre dos extracciones en el caso de que se hayan abastecido solicitudes para gastos mayores de 14.2 metros cúbicos (500 pies cúbicos) por segundo. Además de los volúmenes garantizados, México dejará salir de la presa de El Azúcar y conducirá por su sistema de canales y el río San Juan, para su uso en los Estados Unidos, durante los períodos de sequía y después de haber satisfecho todos los requerimientos de los usuarios mexicanos, aquellas aguas excedentes que, a juicio de la Sección Mexicana no necesiten almacenarse, para ayudar al riego de las tierras que, en el año de 1943, se regaban, en el citado valle del Bajo Río Bravo (Grande) en los Estados Unidos.

ARTICLE 27

The provisions of Article 10, 11, and 15 of this Treaty shall not be applied during a period of five years from the date of the entry into force of this Treaty, or until the Davis dam and the major Mexican diversion structure on the Colorado River are placed in

ARTICULO 27

Durante un lapso de cinco años, contados a partir de la fecha en que principie la vigencia de este Tratado, o hasta que puestas en operación la Presa Davis y la estructura mexicana principal de derivación en el río Colorado, si se ponen en operación estas obras

operation, should these works be placed in operation prior to the expiration of said period. In the meantime Mexico may construct and operate at its expense a temporary diversion structure in the bed of the Colorado River in territory of the United States for the purpose of diverting water into the Alamo Canal, provided that the plans for such structure and the construction and operation thereof shall be subject to the the approval of the United States Section. During this period of time the United States will make available in the river at such diversion structure river flow not currently required in the United States, and the United States will cooperate with Mexico to the end that the latter may satisfy its irrigation requirements within the limits of those requirements for lands irrigated in Mexico from the Colorado River during the year 1943.

antes de aquel plazo, no se aplicarán los Artículos 10, 11 y 15 de este Tratado y, mientras tanto, México podrá construir y operar a sus expensas, en territorio de los Estados Unidos, una estructura de derivación provisional en el lecho del río Colorado, destinada a derivar agua hacia el canal del Alamo; en la inteligencia de que los planos para dicha estructura, su construcción y operación quedarán sujetos a la aprobación de la Sección de los Estados Unidos. Durante el mismo período los Estados Unidos pondrán a disposición de México en el lugar del río en que se construya dicha estructura, los caudales que a la sazón no se requieran en los Estados Unidos y ofrecen cooperar con México a fin de que éste pueda satisfacer sus necesidades de riego, dentro de los límites que tuvieron esas necesidades en las tierras regadas en México con aguas del río Colorado en el año de 1943.

VII - FINAL PROVISIONS

ARTICLE 28

This Treaty shall be ratified and the ratifications thereof shall be exchanged in Washington. It shall enter into force on the day of the exchange of ratifications and shall continue in force until terminated by another Treaty concluded for that purpose between the two Governments.

In witness whereof the respective Plenipotentiaries have signed this Treaty and have hereunto affixed their seals.

Done in duplicate in the English and Spanish languages, in Wash-

VII - DISPOSICIONES FINALES

ARTICULO 28

Este Tratado será ratificado y las ratificaciones canjeadas en la ciudad de Wáshington. Entrará en vigor el día del canje de ratificaciones y regirá indefinidamente hasta que sea terminado por otro Tratado concluído al efecto entre los dos Gobiernos.

En testimonio de lo cual los respectivos Plenipotenciarios han firmado este Tratado y agregado sus sellos.

Hecho en duplicado, en los idiomas inglés y español, en la Ciudad

ington on this third day of February, 1944.

de Wáshington, el día tres de febrero de 1944.

FOR THE GOVERNMENT OF THE UNITED STATES OF AMERICA:

CORDELL HULL [SEAL]

GEORGE S. MESSERSMITH [SEAL]

LAWRENCE M. LAWSON. [SEAL]

FOR THE GOVERNMENT OF THE UNITED MEXICAN STATES:

F. CASTILLO NÁJERA [SEAL]

RAFAEL FERNÁNDEZ MACGREGOR [SEAL]

PROTOCOL

The Government of the United States of America and the Government of the United Mexican States agree and understand that:

Wherever, by virtue of the provisions of the Treaty between the United States of America and the United Mexican States, signed in Washington on February 3, 1944, relating to the utilization of the waters of the Colorado and Tijuana Rivers and of the Rio Grande from Fort Quitman, Texas, to the Gulf of Mexico, specific functions are imposed on, or exclusive jurisdiction is vested in, either of the Sections of the International Boundary and Water Commission, which involve the construction or use of works for storage or conveyance of water, flood control, stream gaging, or for any other purpose, which are situated wholly within the territory of the country of that Section, and which are to be used only partly for the performance of treaty provisions, such jurisdiction shall be exercised, and such functions, including the construction, operation and maintenance of the said works, shall be performed and carried out by the Federal agencies of that country which now or hereafter may be authorized by domestic law to construct, or to operate and maintain, such works. Such functions or jurisdictions shall be exercised in conformity with the provisions of the Treaty and in cooperation

PROTOCOLO

El Gobierno de los Estados Unidos de América y el Gobierno de los Estados Unidos Mexicanos convienen y tienen entendido que:

Siempre que en virtud de lo dispuesto en el Tratado entre los Estados Unidos de América y los Estados Unidos Mexicanos, firmado en Wáshington el 3 de febrero de 1944, relativo al aprovechamiento de las aguas de los ríos Colorado y Tijuana; y del río Bravo (Grande) desde Fort Quitman, Texas, hasta el Golfo de México, se impongan funciones específicas o se confiera jurisdicción exclusiva a cualquiera de las Secciones de la Comisión Internacional de Límites y Aguas, que entrañen la construcción o uso de obras de almacenamiento o de conducción de agua, de control de avenidas, de aforos o para cualquier otro objeto, que estén situadas totalmente dentro del territorio del país al que corresponda esa Sección y que se usen solamente en parte para cumplir con las disposiciones del Tratado, dicha jurisdicción la ejercerán y las referidas funciones, incluso la construcción, operación y conservación de las obras de que se trata, las desempeñarán y realizarán las dependencias federales de ese mismo país, que estén facultadas, en virtud de sus leyes internas actualmente en vigor o que en lo futuro se dicten, para construir, operar y conservar dichas obras. Las citadas funciones y jurisdic-

with the respective Section of the Commission, to the end that all international obligations and functions may be coordinated and fulfilled.

The works to be constructed or used on or along the boundary, and those to be constructed or used exclusively for the discharge of treaty stipulations, shall be under the jurisdiction of the Commission or of the respective Section, in accordance with the provisions of the Treaty. In carrying out the construction of such works the Sections of the Commission may utilize the services of public or private organizations in accordance with the laws of their respective countries.

This Protocol, which shall be regarded as an integral part of the aforementioned Treaty signed in Washington on February 3, 1944, shall be ratified and the ratifications thereof shall be exchanged in Washington. This Protocol shall be effective beginning with the day of the entry into force of the Treaty and shall continue effective so long as the Treaty remains in force.

In witness whereof the respective Plenipotentiaries have signed this Protocol and have hereunto affixed their seals.

Done in duplicate, in the English and Spanish languages, in

ciones se ejercerán observando las disposiciones del Tratado y en cooperación con la respectiva Sección de la Comisión, con el objeto de que todas las obligaciones y funciones internacionales puedan coordinarse y cumplirse.

Las obras que se construyan o usen en la línea divisoria o a lo largo de ella, así como las que se construyan o usen exclusivamente para cumplir con las estipulaciones del Tratado, quedarán bajo la jurisdicción de la Comisión o de la Sección correspondiente de acuerdo con lo dispuesto por el mismo. Para llevar a cabo la construcción de dichas obras, las Secciones de la Comisión podrán utilizar los servicios de organismos públicos o privados, de acuerdo con las leyes de sus respectivos países.

Este Protocolo, que se considerará parte integral del susodicho Tratado firmado en Wáshington el 3 de febrero de 1944, será ratificado y las ratificaciones canjeadas en Wáshington. Este Protocolo entrará en vigor a partir del día en que empiece a regir el Tratado y continuará en vigor por todo el tiempo que esté vigente éste.

En testimonio de lo cual los respectivos Plenipotenciarios han firmado este Protocolo y le han agregado sus sellos.

Hecho en duplicado, en los idiomas inglés y español, en Wásh-

Washington, this fourteenth day of November, 1944.

ington, el día catorce de noviembre de 1944.

FOR THE GOVERNMENT OF THE UNITED STATES OF AMERICA:

E R STETTINIUS Jr [SEAL]
Acting Secretary of State
of the United States of America

FOR THE GOVERNMENT OF THE UNITED MEXICAN STATES:

F. CASTILLO NÁJERA [SEAL]
Ambassador Extraordinary and Plenipotentiary
of the United Mexican States in Washington

AND WHEREAS the Senate of the United States of America by their Resolution of April 18, 1945, two-thirds of the Senators present concurring therein, did advise and consent to the ratification of the said treaty and protocol, subject to certain understandings, the text of which Resolution is word for word as follows:

"*Resolved* (*two-thirds of the Senators present concurring therein*), That the Senate advise and consent to the ratification of Executive A, Seventy-eighth Congress, second session, a treaty between the United States of America and the United Mexican States, signed at Washington on February 3, 1944, relating to the utilization of the waters of the Colorado and Tijuana Rivers and of the Rio Grande from Fort Quitman, Texas, to the Gulf of Mexico, and Executive H, Seventy-eighth Congress, second session, a protocol, signed at Washington on November 14, 1944, supplementary to the treaty, subject to the following understandings, and that these understandings will be mentioned in the ratification of this treaty as conveying the true meaning of the treaty, and will in effect form a part of the treaty:

"(a) That no commitment for works to be built by the United States in whole or in part at its expense, or for expenditures by the United States, other than those specifically provided for in the treaty, shall be made by the Secretary of State of the United States, the Commissioner of the United States Section of the International Boundary and Water Commission, the United States Section of said Commission, or any other officer or employee of the United States, without prior approval of the Congress of the United States. It is understood that the works to be built by the United States, in whole or in part at its expense, and the expenditures by the United States, which are specifically provided for in the treaty, are as follows:

"1. The joint construction of the three storage and flood-control dams on the Rio Grande below Fort Quitman, Texas, mentioned in article 5 of the treaty.

"2. The dams and other joint works required for the diversion of the flow of the Rio Grande mentioned in subparagraph II of article 5 of the treaty, it being understood that the commitment of the United States to make expenditures under this subparagraph is limited to its share of the cost of one dam and works appurtenant thereto.

"3. Stream-gaging stations which may be required under the provisions of section (j) of article 9 of the treaty and of subparagraph (d) of article 12 of the treaty.

"4. The Davis Dam and Reservoir mentioned in subparagraph (b) of article 12 of the treaty.

"5. The joint flood-control investigations, preparation of plans, and reports on the Rio Grande below Fort Quitman required by the provisions of article 6 of the treaty.

"6. The joint flood-control investigations, preparations of plans, and reports on the lower Colorado River between the Imperial Dam and the Gulf of California required by article 13 of the treaty.

"7. The joint investigations, preparation of plans, and reports on the establishment of hydroelectric plants at the international dams on the Rio Grande below Fort Quitman provided for by article 7 of the treaty.

"8. The studies, investigations, preparation of plans, recommendations, reports, and other matters dealing with the Tijuana River system provided for by the first paragraph (including the numbered subparagraphs) of article 16 of the treaty.

"(b) Insofar as they affect persons and property in the territorial limits of the United States, the powers and functions of the Secretary of State of the United States, the Commissioner of the United States Section of the International Boundary and Water Commission, the United States Section of said Commission, and any other officer or employee of the United States, shall be subject to the statutory and constitutional controls and processes. Nothing contained in the treaty or protocol shall be construed as impairing the power of the Congress of the United States to define the terms of office of members of the United States Section of the International Boundary and Water Commission or to provide for their appointment by the President by and with the advice and consent of the Senate or otherwise.

"(c) That nothing contained in the treaty or protocol shall be construed as authorizing the Secretary of State of the United States, the Commissioner of the United States Section of the International Boundary and Water Commission, or the United States Section of said Commission, directly or indirectly to alter or control the distribution of water to users within the territorial limits of any of the individual States.

"(d) That 'international dam or reservoir' means a dam or reservoir built across the common boundary between the two countries.

"(e) That the words 'international plants', appearing in article 19, mean only hydroelectric generating plants in connection with dams built across the common boundary between the two countries.

"(f) That the words 'electric current', appearing in article 19, mean hydroelectric power generated at an international plant.

"(g) That by the use of the words 'The jurisdiction of the Commission shall extend to the limitrophe parts of the Rio Grande

(Rio Bravo) and the Colorado River, to the land boundary between the two countries, and to works located upon their common boundary * * *' in the first sentence of the fifth paragraph of article 2, is meant: 'The jurisdiction of the Commission shall extend and be limited to the limitrophe parts of the Rio Grande (Rio Bravo) and the Colorado River, to the land boundary between the two countries, and to works located upon their common boundary * * *.'

"(h) The word 'agreements' whenever used in subparagraphs (a), (c), and (d) of article 24 of the treaty shall refer only to agreements entered into pursuant to and subject to the provisions and limitations of treaties in force between the United States of America and the United Mexican States.

"(i) The word 'disputes' in the second paragraph of article 2 shall have reference only to disputes between the Governments of the United States of America and the United Mexican States.

"(j) First, that the one million seven hundred thousand acre-feet specified in subparagraph (b) of article 10 includes and is not in addition to the one million five hundred thousand acre-feet, the delivery of which to Mexico is guaranteed in subparagraph (a) of article 10; second, that the one million five hundred thousand acre-feet specified in three places in said subparagraph (b) is identical with the one million five hundred thousand acre-feet specified in said subparagraph (a); third, that any use by Mexico under said subparagraph (b) of quantities of water arriving at the Mexican points of diversion in excess of said one million five hundred thousand acre-feet shall not give rise to any future claim of right by Mexico in excess of said guaranteed quantity of one million five hundred thousand acre-feet of water.

"(k) The United States recognizes a duty to require that the protective structures to be constructed under article 12, paragraph (a), of this treaty, are so constructed, operated, and maintained as to adequately prevent damage to property and lands within the United States from the construction and operation of the diversion structure referred to in said paragraph."

AND WHEREAS the said treaty and protocol were duly ratified by the President of the United States of America on November 1, 1945, in pursuance of the aforesaid advice and consent of the Senate and subject to the aforesaid understandings on the part of the United States of America;

AND WHEREAS the said treaty and protocol were duly ratified by the President of the United Mexican States on October 16, 1945, in pursuance and according to the terms of a Decree of September 27, 1945 of the Senate of the United Mexican States approving the said treaty

and protocol and approving the said understandings on the part of the United States of America in all that refers to the rights and obligations between the parties;

AND WHEREAS it is provided in Article 28 of the said treaty that the treaty shall enter into force on the day of the exchange of ratifications;

AND WHEREAS it is provided in the said protocol that the protocol shall be regarded as an integral part of the said treaty and shall be effective beginning with the day of the entry into force of the said treaty;

AND WHEREAS the respective instruments of ratification of the said treaty and protocol were duly exchanged, and a protocol of exchange of instruments of ratification was signed in the English and Spanish languages, by the respective Plenipotentiaries of the United States of America and the United Mexican States on November 8, 1945, the English text of which protocol of exchange of instruments of ratification reads in part as follows:

> "The ratification by the Government of the United States of America of the treaty and protocol aforesaid recites in their entirety the understandings contained in the resolution of April 18, 1945 of the Senate of the United States of America advising and consenting to ratification, the text of which resolution was communicated by the Government of the United States of America to the Government of the United Mexican States. The ratification by the Government of the United Mexican States of the treaty and protocol aforesaid is effected, in the terms of its instrument of ratification, in conformity to the Decree of September 27, 1945 of the Senate of the United Mexican States approving the treaty and protocol aforesaid and approving also the aforesaid understandings on the part of the United States of America in all that refers to the rights and obligations between both parties, and in which the Mexican Senate refrains from considering, because it is not competent to pass judgment upon them, the provisions which relate exclusively to the internal application of the treaty within the United States of America and by its own authorities, and which are included in the understandings set forth under the letter (a) in its first part to the period preceding the words 'It is understood' and under the letters (b) and (c)."

NOW, THEREFORE, be it known that I, Harry S. Truman, President of the United States of America, do hereby proclaim and make public the said treaty and the said protocol supplementary thereto, to the end that the same and every article and clause thereof may be observed and fulfilled with good faith, on and from the eighth day of November, one thousand nine hundred forty-five, by the United

States of America and by the citizens of the United States of America and all other persons subject to the jurisdiction thereof.

IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the city of Washington this twenty-seventh day of November in the year of our Lord one thousand nine hundred
[SEAL] forty-five and of the Independence of the United States of America the one hundred seventieth.

HARRY S TRUMAN

By the President:
JAMES F BYRNES
Secretary of State

☆ U. S. GOVERNMENT PRINTING OFFICE : 1964 O - 755-421

1 G.1

Upper Colorado River Basin Compact, 1948

The State of Arizona, the State of Colorado, the State of New Mexico, the State of Utah and the State of Wyoming, acting through their Commissioners,

Charles A. Carson for the Statre of Arizona,
Clifford H. Stone for the State of Colorado,
Fred E. Wilson for the State of New Mexico,
Edward H. Watson for the State of Utah, and
L. C. Bishop for the State of Wyoming,

after negotiations participated in by Harry W. Bashore, appointed by the President as the representative of the United States of America, have agreed, subject to the provisions of the Colorado River Compact, to determine the rights and obligations of each signatory State respecting the uses and deliveries of the water of the Upper Basin of the Colorado River, as follows:

ARTICLE I

(a) The major purposes of this Compact are to provide for the equitable division and apportionment of the use of the waters of the Colorado River System, the use of which was apportioned in perpetuity to the Upper Basin by the Colorado River Compact; to establish the obligations of each State of the Upper Division with respect to the deliveries of water required to be made at Lee Ferry by the Colorado River Compact; to promote interstate comity; to remove causes of present and future controversies; to secure the expeditious agricultural and industrial development of the Upper Basin, the storage of water and to protect life and property from floods.

(b) It is recognized that the Colorado River Compact is in full force and effect and all of the provisions hereof are subject thereto.

ARTICLE II

As used in this Compact:

(a) The term "Colorado River System" means that portion of the Colorado River and its tributaries within the United States of America.

(b) The term "Colorado River Basin" means all of the drainage area of the Colorado River System and all other territory within the United States of America to which the waters of the Colorado River System shall be beneficially applied.

(c) The term "States of the Upper Division" means the States of Colorado, New Mexico, Utah and Wyoming.

(d) The term "States of the Lower Division" means the States of Arizona, California and Nevada.

(e) The term "Lee Ferry" means a point in the main stream of the Colorado River one mile below the mouth of the Paria River.

(f) The term "Upper Basin" means those parts of the States of Arizona, Colorado, New Mexico, Utah, and Wyoming within and from which waters naturally drain into the Colorado River System above Lee Ferry, and also parts of said States located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the Colorado River System above Lee Ferry.

(g) The term "Lower Basin" means those parts of the States of Arizona, California, Nevada, New Mexico and Utah within and from which waters naturally drain into the Colorado River System below Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the Colorado River System below Lee Ferry.

(h) The term "Colorado River Compact" means the agreement concerning the apportionment of the use of the waters of the Colorado River System dated November 24, 1922, executed by Commissioners for the States of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming, approved by Herbert Hoover, representative of the United States of America, and proclaimed effective by the President of the United States of America, June 25, 1929.

(i) The term "Upper Colorado River System" means that portion of the Colorado River System above Lee Ferry.

(j) The term "Commission" means the administrative agency created by Article VIII of this Compact.

(k) The term "water year" means that period of twelve months ending September 30 of each year.

(l) The term "acre-foot" means the quantity of water required to cover an acre to the depth of one foot and is equivalent to 43,560 cubic feet.

(m) The term "domestic use" shall include the use of water for household, stock, municipal, mining, milling, industrial and other like purposes, but shall exclude the generation of electrical power.

(n) The term "virgin flow" means the flow of any stream undepleted by the activities of man.

ARTICLE III

(a) Subject to the provisions and limitations contained in the Colorado River Compact and in this Compact, there is hereby apportioned from the Upper Colorado River System in perpetuity to the States of Arizona, Colorado, New Mexico, Utah and Wyoming, respectively, the consumptive use of water as follows:

(1) To the State of Arizona the consumptive use of 50,000 acre-feet of water per annum.

(2) To the States of Colorado, New Mexico, Utah and Wyoming, respectively, the consumptive use per annum of the quantities resulting from the application of the following percentages to the total quantity of consumptive use per annum apportioned in perpetuity to and available for use each year by Upper Basin under the Colorado River Compact and remaining after the deduction of the use, not to exceed 50,000 acre-feet per annum, made in the State of Arizona.

State of Colorado, 51.75 per cent; State of New Mexico, 11.25 per cent; State of Utah, 23.00 per cent; State of Wyoming, 14.00 per cent.

(b) The apportionment made to the respective States by paragraph (a) of this Article is based upon, and shall be applied in conformity with, the following principles and each of them:

(1) The apportionment is of any and all man-made depletions;

(2) Beneficial use is the basis, the measure and the limit of the right to use;

(3) No State shall exceed its apportioned use in any water year when the effect of such excess use, as determined by the Commission, is to deprive another signatory State of its apportioned use during that water year; provided, that this subparagraph (b) (3) shall not be construed as:

(i) Altering the apportionment of use, or obligations to make deliveries as provided in Articles XI, XII, XIII or XIV of this Compact:

(ii) Purporting to apportion among the signatory States such uses of water as the Upper Basin may be entitled to under paragraphs (f) and (g) of Article III of the Colorado River Compact; or

(iii) Countenancing average uses by any signatory State in excess of its apportionment.

(4) The apportionment to each State includes all water necessary for the supply of any rights which now exist.

(c) No apportionment is hereby made, or intended to be made, of such uses of water as the Upper Basin may be entitled to under paragraphs (f) and (g) of Article III of the Colorado River Compact.

(d) The apportionment made by this Article shall not be taken as any basis for the allocation among the signatory States of any benefits resulting from the generation of power.

ARTICLE IV

In the event curtailment of use of water by the States of the Upper Division at any time shall become necessary in order that the flow at Lee Ferry shall not be depleted below that required by Article III of the Colorado River Compact, the extent of curtailment by each State of the consumptive use of water apportioned to

it by Article III of this Compact shall be in such quantities and at such times as shall be determined by the Commission upon the application of the following principles:

(a) The extent and times of curtailment shall be such as to assure full compliance with Article III of the Colorado River Compact;

(b) If any State or States of the Upper Division, in the ten years immediately preceding the water year in which curtailment is necessary, shall have consumptively used more water than it was or they were, as the case may be, entitled to use under the apportionment made by Article III of this Compact, such State or States shall be required to supply at Lee Ferry a quantity of water equal to its, or the aggregate of their, overdraft of the proportionate part of such overdraft, as may be necessary to assure compliance with Article III of the Colorado River Compact, before demand is made on any other State of the Upper Division;

(c) Except as provided in subparagraph (b) of this Article, the extent of curtailment by each State of the Upper Division of the consumptive use of water apportioned to it by Article III of this Compact shall be such as to result in the delivery at Lee Ferry of a quantity of water which bears the same relation to the total required curtailment of use by the States of the Upper Division as the consumptive use of Upper Colorado River System water which was made by each such State during the water year immediately preceding the year in which the curtailment becomes necessary bears to the total consumptive use of such water in the States of the Upper Division during the same water year; provided, that in determining such relation the uses of water under rights perfected prior to November 24, 1922, shall be excluded.

ARTICLE V

(a) All losses of water occurring from or as the result of the storage of water in reservoirs constructed prior to the signing of this Compact shall be charged to the State in which such reservoir or reservoirs are located. Water stored in reservoirs covered by this paragraph (a) shall be for the exclusive use of and shall be charged to the State in which the reservoir or reservoirs are located.

(b) All losses of water occurring from or as the result of the storage of water in reservoirs constructed after the signing of this Compact shall be charged as follows:

(1) If the Commission finds that the reservoir is used, in whole or in part, to assist the States of the Upper Division in meeting their obligations to deliver water at Lee Ferry imposed by Article III of the Colorado River Compact, the Commission shall make findings, which in no event shall be contrary to the laws of the United States of America under which any reservoir is constructed, as to the reservoir capacity allocated for that purpose. The whole or that portion, as the case may be, of reservoir losses as found by the Commission to be reasonably and properly chargeable to the reservoir or reservoir capacity utilized to assure deliveries at Lee Ferry shall be charged to the States of the Upper Division in the proportion which the consumptive use of water in each State of the Upper Division during the water year in which the charge is made bears to the total consumptive use of water in all States of the Upper Division during the same water year. Water stored in reservoirs or in reservoir capacity covered by this subparagraph (b) (1) shall be for the common benefit of all of the States of the Upper Division.

(2) If the Commission finds that the reservoir is used, in whole or in part, to supply water for use in a State of the Upper Division, the Commission shall make findings, which in no event shall be contrary to the laws of the United States of America under which any reservoir is constructed, as to the reservoir or reservoir capacity utilized to supply water for use and the State in which such water will be used. The whole or that proportion, as the case may be, of reservoir losses as found by the Commission to be reasonably and properly chargeable to the State in which such water will be used shall be borne by that State. As determined by the Commission, water stored in reservoirs covered by this subparagraph (b) (2) shall be earmarked for and charged to the State in which the water will be used.

(c) In the event the Commission finds that a reservoir site is available both to assure deliveries at Lee Ferry and to store water for consumptive use in a State of the Upper Division, the storage of water for consumptive use shall be given preference. Any reservoir or reservoir capacity hereafter used to assure deliveries at Lee Ferry shall by order of the Commission be used to store water for consumptive use in a State, provided the Commission finds that such storage is reasonably necessary to permit such State to make the use of the water apportioned to it by this Compact.

ARTICLE VI

The Commission shall determine the quantity of the consumptive use of water, which use is apportioned by Article III hereof, for the Upper Basin and for each State of the Upper Basin by the inflow-outflow method in terms of man-made depletions of the virgin flow at Lee Ferry, unless the Commission, by unanimous action, shall adopt a different method of determination.

ARTICLE VII

The consumptive use of water by the United States of America or any of its agencies, instrumentalities or wards shall be charged as a use by the State in which the use is made; provided, that such consumptive use incident to the diversion, impounding, or conveyance of water in one State for use in another shall be charged to such latter State.

ARTICLE VIII

(a) There is hereby created an interstate administrative agency to be known as the "Upper Colorado River Commission." The Commission shall be composed of one Commissioner, representing each of the States of the Upper Division, namely, the States of Colorado, New Mexico, Utah and Wyoming, designated or appointed in accordance with the laws of each such State and, if designated by the President, one Commissioner representing the United States of America. The President is hereby requested to designate a Commissioner. If so designated the Commissioner representing the United States of America shall be the presiding officer of the Commission and shall be entitled to the same power and rights as the Commissioner of any State. Any four members of the Commission shall constitute a quorum.

(b) The salaries and personal expenses of each Commissioner shall be paid by the Government which he represents. All other expenses which are incurred by the Commission incident to the administration of this Compact, and which are not paid by the United States of America, shall be borne by the four States according to the percentage of consumptive use apportioned to each. On or before December 1 of each year, the Commission shall adopt and transmit to the Governors of the four States and to the President a budget covering an estimate of its expenses for the following year, and of the amount payable by each State. Each State shall pay the amount due by it to the Commission on or before April 1 of the year following. The payment of the expenses of the Commission and of its employees shall not be subject to the audit and accounting procedures of any of the four States; however, all receipts and disbursement of funds handled by the Commission shall be audited yearly by a qualified independent public accountant and the report of the audit shall be included in and become a part of the annual report of the Commission.

(c) The Commission shall appoint a Secretary, who shall not be a member of the Commission, or an employee of any signatory State or of the United States of America while so acting. He shall serve for such term and receive such salary and perform such duties as the Commission may direct. The Commission may employ such engineering, legal, clerical and other personnel as, in its judgment, may be necessary for the performance of its functions under this Compact. In the hiring of employees, the Commission shall not be bound by the civil service laws of any State.

(d) The Commission, so far as consistent with this Compact, shall have the power to:

(1) Adopt rules and regulations;

(2) Locate, establish, construct, abandon, operate and maintain water gaging stations;

(3) Make estimates to forecast water run-off on the Colorado River and any of its tributaries;

(4) Engage in cooperative studies of water supplies of the Colorado River and its tributaries;

(5) Collect, analyze, correlate, preserve and report on data as to the stream flows, storage, diversions and use of the waters of the Colorado River, and any of its tributaries;

(6) Make findings as to the quantity of water of the Upper Colorado River System used each year in the Upper Colorado River Basin and in each State thereof;

(7) Make findings as to the quantity of water deliveries at Lee Ferry during each water year;

(8) Make findings as to the necessity for and the extent of the curtailment of use, required, if any, pursuant to Article IV hereof;

(9) Make findings to the quantity of reservoir losses and as to the share thereof chargeable under Article V hereof to each of the States;

(10) Make findings of fact in the event of the occurrence of extraordinary drought or serious accident to the irrigation system in the Upper Basin, whereby deliveries by the Upper Basin of water which it may be required to deliver in order to aid in fulfilling obligations of the United States of America to the United Mexican States arising under the Treaty between the United States of America and the United Mexican States, dated February 3, 1944 (Treaty Series 994) become difficult, and report such findings to the Governors of the Upper Basin States, the President of the United States of America, the United States Section of the International Boundary and Water Commission, and such other Federal officials and agencies as it may deem appropriate to the end that the water allotted to Mexico under Division III of such treaty may be reduced in accordance with the terms of such Treaty;

(11) Acquire and hold such personal and real property as may be necessary for the performance of its duties hereunder and to dispose of the same when no longer required;

(12) Perform all functions required of it by this Compact and do all things necessary, proper or convenient in the performance of its duties hereunder, either independently or in cooperation with any state or federal agency;

(13) Make and transmit annually to the Governors of the signatory States and the President of the United States of America, with the estimated budget, a report covering the activities of the Commission for the preceding water year.

(e) Except as otherwise provided in this Compact the concurrence of four members of the Commission shall be required in any action taken by it.

(f) The Commission and its Secretary shall make available to the Governor of each of the signatory States any information within its possession at any time, and shall always provide free access to its records by the Governors of each of the States, or their representatives, or authorized representatives of the United States of America.

(g) Findings of fact made by the Commission shall not be conclusive in any court, or before any agency or tribunal, but shall constitute prima facie evidence of the facts found.

(h) The organization meeting of the Commission shall be held within four months from the effective date of this Compact.

ARTICLE IX

(a) No State shall deny the right of the United States of America and, subject to the conditions hereinafter contained, no State shall deny the right of another signatory State, any person, or entity of any signatory State to acquire rights to the use of water, or to construct or participate in the construction and use of diversion works and storage reservoirs with appurtenant works, canals and conduits in one State for the purpose of diverting, conveying, storing, regulating and releasing water to satisfy the provisions of the Colorado River Compact relating to the obligation of the States of the Upper Division to make deliveries of water at Lee Ferry, or for the purpose of diverting, conveying, storing or regulating water in an upper signatory State for consumptive use in a lower signatory State, when such use is within the apportionment to such lower State made by this Compact. Such rights shall be subject to the rights of water users, in a State in which such reservoir or works are located, to receive and use water, the use of which is within the apportionment to such State by this Compact.

(b) Any signatory State, any person or any entity of any signatory State shall have the right to acquire such property rights as are necessary to the use of water in conformity with this compact in any other signatory State by donation, purchase or through the exercise of the power of eminent domain. Any signatory State, upon the written request of the Governor of any other signatory State, for the benefit of whose water users property is to be acquired in the State to which such written request is made, shall proceed expeditiously to acquire the desired property either by purchase at a price satisfactory to the requesting State, or, if such purchase cannot be made, then through the exercise of its power of eminent domain and shall convey such

property to the requesting State or such entity as may be designated by the requesting State; provided, that all costs of acquisition and expenses of every kind and nature whatsoever incurred in obtaining the requested property shall be paid by the requesting State at the time and in the manner prescribed by the State requested to acquire the property.

(c) Should any facility be constructed in a signatory State by and for the benefit of another signatory State or States or the water users thereof, as above provided, the construction, repair, replacement, maintenance and operation of such facility shall be subject to the laws of the State in which the facility is located, except that, in the case of a reservoir constructed in one State for the benefit of another State or States, the water administration officials of the State in which the facility is located shall permit the storage and release of any water which, as determined by findings of the Commission, falls within the apportionment of the State or States for whose benefit the facility is constructed. In the case of a regulating reservoir for the joint benefit of all States in making Lee Ferry deliveries, the water administration officials of the State in which the facility is located, in permitting the storage and release of water, shall comply with the findings and orders of the Commission.

(d) In the event property is acquired by a signatory State in another signatory State for the use and benefit of the former, the users of water made available by such facilities, as a condition precedent to the use thereof, shall pay to the political subdivisions of the State in which such works are located, each and every year during which such rights are enjoyed for such purposes, a sum of money equivalent to the average annual amount of taxes levied and assessed against the land and improvements thereon during the ten years preceding the acquisition of such land. Said payments shall be in full reimbursement for the loss of taxes in such political subdivisions of the State, and in lieu of any and all taxes on said property, improvements and rights. The signatory States recommend to the President and the Congress that, in the event the United States of America shall acquire property in one of the signatory States for the benefit of another signatory State, or its water users, provision be made for like payment in reimbursement of loss of taxes.

ARTICLE X

(a) The signatory States recognize La Plata River Compact entered into between the States of Colorado and New Mexico, dated November 27, 1922, approved by the Congress on January 29, 1925 (43 Stat. 796), and this Compact shall not affect the apportionment therein made.

(b) All consumptive use of water of La Plata River and its tributaries shall be charged under the apportionment of Article III hereof to the State in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one State for use in the other shall be charged to the latter State.

ARTICLE XI

Subject to the provisions of this Compact, the consumptive use of the water of the Little Snake River and its tributaries is hereby apportioned between the States of Colorado and Wyoming in such quantities as shall result from the application of the following principles and procedures:

(a) Water used under rights existing prior to the signing of this Compact.

(1) Water diverted from any tributary of the Little Snake River or from the main stem of the Little Snake River above a point one hundred feet below the confluence of Savery Creek and the Little Snake River shall be administered without regard to rights covering the diversion of water from any down-stream points.

(2) Water diverted from the main stem of the Little Snake River below a point one hundred feet below the confluence of Savery Creek and the Little Snake River shall be administered on the basis of an interstate priority schedule prepared by the Commission in conformity with priority dates established by the laws of the respective States.

(b) Water used under rights initiated subsequent to the signing of this Compact.

(1) Direct flow diversions shall be so administered that, in time of shortage, the curtailment of use on each acre of land irrigated thereunder shall be as nearly equal as may be possible in both of the States.

(2) The storage of water by projects located in either State, whether of supplemental supply or of water used to irrigate land not irrigated at the date of the signing of this Compact, shall be so administered that in times of water shortage the curtailment of storage of water available for each acre of land irrigated thereunder shall be as nearly equal as may be possible in both States.

(c) Water uses under the apportionment made by this Article shall be in accordance with the principle that beneficial use shall be the basis, measure and limit of the right to use.

(d) The States of Colorado and Wyoming each assent to diversions and storage of water in one State for use in the other State, subject to compliance with Article IX of this Compact.

(e) In the event of the importation of water to the Little Snake River Basin from any other river basin, the State making the importation shall have the exclusive use of such imported water unless by written agreement, made by the representatives of the States of Colorado and Wyoming on the Commission, it is otherwise provided.

(f) Water use projects initiated after the signing of this Compact, to the greatest extent possible, shall permit the full use within the Basin in the most feasible manner of the waters of the Little Snake River and its tributaries, without regard to the state line; and, so far as is practicable, shall result in an equal division between the States of the use of water not used under rights existing prior to the signing of this Compact.

(g) All consumptive use of the waters of the Little Snake River and its tributaries shall be charged under the apportionment of Article III hereof to the State in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one State for use in the other shall be charged to the latter State.

ARTICLE XII

Subject to the provisions of this Compact, the consumptive use of the waters of Henry's Fork, a tributary of Green River originating in the State of Utah and flowing into the State of Wyoming and thence into the Green River in the State of Utah; Beaver Creek, originating in the State of Utah and flowing into Henry's Fork in the State of Wyoming; Burnt Fork, a tributary of Henry's Fork, originating in the State of Utah and flowing into Henry's Fork in the State of Wyoming; Birch Creek, a tributary of Henry's Fork, originating in the State of Utah and flowing into Henry's Fork in the State of Wyoming; and Sheep Creek, a tributary of Green River in the State of Utah, and their tributaries are hereby apportioned between the States of Utah and Wyoming in such quantities as will result from the application of the following principles and procedures:

(a) Waters used under rights existing prior to the signing of this Compact.

Waters diverted from Henry's Fork, Beaver Creek, Burnt Fork, Birch Creek and their tributaries, shall be administered without regard to the state line on the basis of an interstate priority schedule to be prepared by the States affected and approved by the Commission in conformity with the actual priority of right of use, the water requirements of the land irrigated and the acreage irrigated in connection therewith.

(b) Waters used under rights from Henry's Fork, Beaver Creek, Burnt Fork, Birch Creek and their tributaries, initiated after the signing of this Compact shall be divided fifty percent to the State of Wyoming and fifty percent to the State of Utah and each State may use said waters as and where it deems advisable.

(c) The State of Wyoming assents to the exclusive use by the State of Utah of the water of Sheep Creek, except that the lands, if any, presently irrigated in the State of Wyoming from the water of Sheep Creek shall be supplied with water from Sheep Creek in order of priority and in such quantities as are in conformity with the laws of the State of Utah.

(d) In the event of the importation of water to Henry's Fork, or any of its tributaries, from any other river basin, the State making the importation shall have the exclusive use of such imported water unless by written agreement made by the representatives of the States of Utah and Wyoming on the Commission, it is otherwise provided.

(e) All consumptive use of waters of Henry's Fork, Beaver Creek, Burnt Fork, Birch Creek, Sheep Creek, and their tributaries shall be charged under the apportionment of Article III hereof to the State in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one State for use in the other shall be charged to the latter State.

(f) The States of Utah and Wyoming each assent to the diversion and storage of water in one State for use in the other State, subject to compliance with Article IX of this Compact. It shall be the duty of the water administrative officials of the State where the water is stored to release said stored water to the other State upon demand. If either the State of Utah or the State of Wyoming shall construct a reservoir in the other State for use in its own State, the water users of the State in which said facilities are constructed may purchase at cost a portion of the capacity of said reservoir sufficient for the irrigation of their lands thereunder.

(g) In order to measure the flow of water diverted, each State shall cause suitable measuring devices to be constructed, maintained and operated at or near the point of diversion into each ditch.

(h) The State Engineers of the two States jointly shall appoint a Special Water Commissioner who shall have authority to administer the water in both States in accordance with the terms of this Article. The salary and expense of such Special Water Commissioner shall be paid, thirty percent by the State of Utah and seventy percent by the State of Wyoming.

ARTICLE XIII

Subject to the provisions of this Compact, the rights to the consumptive use of the water of the Yampa River, a tributary entering the Green River in the State of Colorado, are hereby apportioned between the States of Colorado and Utah in accordance with the following principles:

(a) The State of Colorado will not cause the flow of the Yampa River at the Maybell Gaging Station to be depleted below an aggregate of 5,000,000 acre-feet for any period of ten consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification and approval of this Compact. In the event any diversion is made from the Yampa River or from tributaries entering the Yampa River above the Maybell Gaging Station for the benefit of any water use project in the State of Utah, then the gross amount of all such diversions for use in the State of Utah, less any returns from such diversions to the River above Maybell, shall be added to the actual flow at the Maybell Gaging Station to determine the total flow at the Maybell Gaging Station.

(b) All consumptive use of the waters of the Yampa River and its tributaries shall be charged under the apportionment of Article III hereof to the State in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one State for use in the other shall be charged to the latter State.

ARTICLE XIV

Subject to the provisions of this Compact, the consumptive use of the waters of the San Juan River and its tributaries is hereby apportioned between the States of Colorado and New Mexico as follows:

The State of Colorado agrees to deliver to the State of New Mexico from the San Juan River and its tributaries which rise in the State of Colorado a quantity of water which shall be sufficient, together with water originating in the San Juan Basin in the State of New Mexico, to enable the State of New Mexico to make full use of the water apportioned to the State of New Mexico by Article III of this Compact, subject, however, to the following:

(a) A first and prior right shall be recognized as to:

(1) All uses of water made in either State at the time of the signing of this Compact; and

(2) All uses of water contemplated by projects authorized, at the time of the signing of this Compact, under the laws of the United States of America whether or not such projects are eventually constructed by the United States of America or by some other entity.

(b) The State of Colorado assents to diversions and storage of water in the State of Colorado for use in the State of New Mexico, subject to compliance with Article IX of this Compact.

(c) The uses of the waters of the San Juan River and any of its tributaries within either State which are dependent upon a common source of water and which are not covered by (a) hereof, shall in times of water shortages be reduced in such quantity that the resulting consumptive use in each State will bear the same proportionate relation to the consumptive use made in each State during times of average water supply as determined by the Commission; provided, that any preferential uses of water to which Indians are entitled under Article XIX shall be excluded in determining the amount of curtailment to be made under this paragraph.

(d) The curtailment of water use by either State in order to make deliveries at Lee Ferry as required by Article IV of this Compact shall be independent of any and all conditions imposed by this Article and shall be made by each State, as and when required, without regard to any provision of this Article.

(e) All consumptive use of the waters of the San Juan River and its tributaries shall be charged under the apportionment of Article III hereof to the State in which the use is made; provided, that consumptive use incident to the diversion, impounding or conveyance of water in one State for use in the other shall be charged to the latter State.

ARTICLE XV

(a) Subject to the provisions of the Colorado River Compact and of this Compact, water of the Upper Colorado River System may be impounded and used for the generation of electrical power, but such impounding and use shall be subservient to the use and consumption of such water for agricultural and domestic purposes and shall not interfere with or prevent use for such dominant purposes.

(b) The provisions of this Compact shall not apply to or interfere with the right or power of any signatory State to regulate within its boundaries the appropriation, use and control of water, the consumptive use of which is apportioned and available to such State by this Compact.

ARTICLE XVI

The failure of any State to use the water, or any part thereof, the use of which is apportioned to it under the terms of this Compact, shall not constitute a relinquishment of the right to such use to the Lower Basin or to any other State, nor shall it constitute a forfeiture or abandonment of the right to such use.

ARTICLE XVII

The use of any water now or hereafter imported into the natural drainage basin of the Upper Colorado River System shall not be charged to any State under the apportionment of consumptive use made by this Compact.

ARTICLE XVIII

(a) The State of Arizona reserves its rights and interests under the Colorado River Compact as a State of the Lower Division and as a State of the Lower Basin.

(b) The State of New Mexico and the State of Utah reserve their respective rights and interests under the Colorado River Compact as States of the Lower Basin.

ARTICLE XIX

Nothing in this Compact shall be construed as:

(a) Affecting the obligations of the United States of America to Indian tribes;

(b) Affecting the obligations of the United States of America under the Treaty with the United Mexican States (Treaty Series 994);

(c) Affecting any rights or powers of the United States of America, its agencies or instrumentalities, in or to the waters of the Upper Colorado River System, or its capacity to acquire rights in and to the use of said waters;

(d) Subjecting any property of the United States of America, its agencies or instrumentalities, to taxation by any State or subdivision thereof, or creating any obligation on the part of the United States of America, its agencies or instrumentalities, by reason of the acquisition, construction or operation of any property or works of whatever kind, to make any payment to any State or political subdivision thereof, State agency, municipality or entity whatsoever, in reimbursement for the loss of taxes;

(e) Subjecting any property of the United States of America, its agencies or instrumentalities, to the laws of any State to any extent other than the extent to which such laws would apply without regard to this Compact.

ARTICLE XX

This Compact may be terminated at any time by the unanimous agreement of the signatory States. In the event of such termination, all rights established under it shall continue unimpaired.

ARTICLE XXI

This Compact shall become binding and obligatory when it shall have been ratified by the legislatures of each of the signatory States and approved by the Congress of the United States of America. Notice of ratification by the legislatures of the signatory States shall be given by the Governor of each signatory State to the Governor of each of the other signatory States and to the President of the United States of America, and the President is hereby requested to give notice to the Governor of each of the signatory States of approval by the Congress of the United States of America.

In WITNESS WHEREOF, the Commissioners have executed six counterparts hereof each of which shall be and constitute an original, one of which shall be deposited in the archives of the Department of State of the United States of America, and one of which shall be forwarded to the Governor of each of the signatory States.

Done at the City of Santa Fe, State of New Mexico, this 11th day of October 1948.

CHARLES A. CARSON
Commissioner for the State of Arizona
CLIFFORD H. STONE
Commissioner for the State of Colorado
FRED E. WILSON
Commissioner for the State of New Mexico
EDWARD H. WATSON
Commissioner for the State of Utah
L. C. BISHOP
Commissioner for the State of Wyoming
GROVER A. GILES
Secretary

Approved:
HARRY W. BASHORE
Representative of the United States of America

NOTES

Congressional consent to negotiations.—Section 19 of the Boulder Canyon Project Act (45 Stat. 1057, 1065), gave the Congress' consent "to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming to negotiate and enter into compacts or agreements, supplemental to and in conformity with the Colorado River compact and consistent with this Act for a comprehensive plan for the development of the Colorado River and providing for the storage, diversion, and use of the waters of said river." The consent was given "upon condition that a representative of the United States, to be appointed by the President, shall participate in the negotiations and shall make report to Congress of the proceedings and of any compact or agreement entered into." It was also provided that no such compact should be effective until "approved" by the legislatures of the States and by the Congress. See also Article VI of the Colorado River compact, p. 55 *ante*.

State ratifications.—*Arizona*, Act of January 21, 1949 (Sess. L. 1949, p. 5; Ariz. Rev. Stat. Ann. 1956, sec. 45-581).

Colorado, Act of February 2, 1949 (Sess. L. 1949, p. 498; Colo. Rev. Stat. 1963, sec. 149-8-1).

New Mexico, Act of February 2, 1949 (Laws 1949, p. 9; N.M. Stat. 1953, sec. 75-34-3 note).

Utah, Act of January 31, 1949 (Laws 1949, p. 25; 1953 Utah Code Ann. secs. 73-13-9ff).

Wyoming, Act of January 25, 1949 (Sess. L. 1949. p. 7; 1945 Wyo. Stat. 1957, sec. 41-507).

Congressional consent to compact.—Act of April 6, 1949 (63 Stat. 31, from which the text of the Compact above set out is taken. For legislative history, see S. 790 and H.R. 2325, 81st Congress; Senate Report 39 (Committee on Interior and Insular Affairs) and House Report 270 (Committee on Public Lands), 81st Congress; 95 *Cong. Rec.* 2758-2762, 3036-3041 (1949); Public Law 37, 81st Congress. Printed hearings on H.R. 2325.

Related documents.—The report of the Federal representative is printed in Senate Document 8, 81st Congress. The Upper Colorado River Basin Compact Commission published, in mimeographed form, an undated three-volume *Official Record* of its proceedings, including the final report of its Engineering Advisory Committee and that Committee's "Inflow-Outflow Manual."

Related legislation.—Act of April 11, 1956 (70 Stat. 105), authorizing construction by the Secretary of the Interior of the Colorado River Storage Project and participating projects; Act of June 13, 1962 (76 Stat. 96), authorizing construction of the Navajo and San Juan-Chama projects; Act of August 16, 1962 (76 Stat. 389), authorizing construction of the Fryingpan-Arkansas project; and the Act of September 30, 1968 (82 Stat. 885), authorizing construction of the Colorado River Basin project including, among others, the Central Arizona project.

Animas-La Plata Project Compact.—Section 501, subsection (b), of the Act of September 30, 1968 (82 Stat. 885), which provides for construction of the Animas-La Plata Federal reclamation project, also provides that construction work shall not be begun until the States of Colorado and New Mexico have ratified a compact reading as follows:

"The State of Colorado and the State of New Mexico, in order to implement the operation of the Animas-La Plata Federal Reclamation Project, Colorado-New Mexico, a proposed participating project under the Colorado River Storage Project Act (70 Stat. 105), and being moved by considerations of interstate comity, have resolved to conclude a compact for these purposes and have agreed upon the following articles:

"ARTICLE I

"A. The right to store and divert water in Colorado and New Mexico from the La Plata and Animas River systems, including return flow to the La Plata River from Animas River diversions, for uses in New Mexico under the Animas-La Plata Federal Reclamation Project shall be valid and of equal priority with those rights granted by decree of the Colorado state courts for the uses of water in Colorado for that project, providing such uses in New Mexico are within the allocation of water made to that state by articles III and XIV of the Upper Colorado River Basin Compact (63 Stat. 31).

"B. The reestrictions of the last sentence of Section (a) of Article IX of the Upper Colorado River Basin Compact shall not be construed to vitiate paragraph A of this article.

"ARTICLE II

"This Compact shall become binding and obligatory when it shall have been ratified by the legislatures of each of the signatory States."

Neither State has yet (September 1968) taken the action required by this provision.

1-H.1

COLORADO RIVER STORAGE PROJECT—AUTHORITY TO CONSTRUCT, OPERATE AND MAINTAIN

See Legislative History, p. 1526

CHAPTER 203—PUBLIC LAW 485

[S. 500]

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

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That:

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

Sec. 2. In carrying out further investigations of projects under the Federal reclamation laws in the Upper Colorado River Basin, the Secretary shall give priority to completion of planning reports on the Gooseberry, San Juan-Chama, Navajo, Parshall, Troublesome, Rabbit Ear, Eagle Divide, San Miguel, West Divide, Bluestone, Battlement Mesa, Tomichi Creek, East River, Ohio Creek, Fruitland Mesa, Bostwick Park, Grand Mesa, Dallas Creek, Savery-Pot Hook, Dolores, Fruit Growers Extension, Animas-La Plata, Yellow Jacket, and Sublette participating projects. Said reports shall be completed as expeditiously as funds are made available therefor and shall be submitted promptly to the affected States, which in the case of the San Juan-Chama project shall include the State of Texas, and thereafter to the President and the Congress: *Provided*,

That with reference to the plans and specifications for the San Juan-Chama project, the storage for control and regulation of water imported from the San Juan River shall (1) be limited to a single offstream dam and reservoir on a tributary of the Chama River, (2) be used solely for control and regulation and no power facilities shall be established, installed or operated thereat, and (3) be operated at all times by the Bureau of Reclamation of the Department of the Interior in strict compliance with the Rio Grande Compact as administered by the Rio Grande Compact Commission. The preparation of detailed designs and specifications for the works proposed to be constructed in connection with projects shall be carried as far forward as the investigations thereof indicate is reasonable in the circumstances.

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

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

Sec. 4. Except as otherwise provided in this Act, in constructing, operating, and maintaining the units of the Colorado River storage project and the participating projects listed in section 1 of this Act, the Secretary shall be governed by the Federal reclamation laws (Act of June 17, 1902, 32 Stat. 388,[52] and Acts amendatory thereof or supplementary thereto): *Provided*, That (a) irrigation repayment contracts shall be entered into which, except as otherwise provided for the Paonia and Eden projects, provide for repayment of the obligation assumed thereunder with respect to any project contract unit over a period of not more than fifty years exclusive of any development period authorized by law; (b) prior to construction of irrigation distribution facilities, repayment contracts shall be made with an "organization" as defined in paragraph 2(g) of the Reclamation Project Act of 1939 (53 Stat. 1187)[53] which has the capacity to levy assessments upon all taxable real property located within its boundaries to assist in making repayments, except where a substantial proportion of the lands to be served are owned by the United States; (c) contracts relating to municipal water supply may be made without regard to the limitations of the last sentence of section 9(c) of the Reclamation Project Act of 1939;[54] and (d), as to Indian lands within, under or served by any participating project, payment of construction costs within the capability of the land to repay shall be subject to the Act of July 1, 1932 (47 Stat. 564):[55] *Provided further*, That for a period of ten years from the date of enactment of this Act, no water from any participating project authorized by this Act shall be delivered to any water user for the production on newly irrigated lands of any basic agricultural commodity, as defined in the Agricultural Act of 1949, or any amendment thereof, if the total supply of such commodity for the marketing year in which the bulk of the crop would normally be marketed is in excess of the normal supply as defined in section 301(b) (10) of the Agricultural Adjustment Act of 1938, as amended,[56] unless the Secretary of Agriculture calls for an increase in production of such commodity in the interest of national security. All units and participating projects shall be subject to the apportionments of the use of water between the Upper and Lower Basins of the Colorado River and among the States of the Upper Basin fixed in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, and to the terms of the treaty with the United Mexican States (Treaty Series 994).

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[52]. [43] U.S.C.A. §§ 372, 373, 381, 383, 391, 392, 411, 416, 419, 421, 431, 432, 434, 439, 461, 476, 491, 498.

[53] 43 U.S.C.A. § 485a (g).

[54] 43 U.S.C.A. § 485h (c).

[55] 25 U.S.C.A. § 386a.

[56] 7 U.S.C.A. § 1301(b) (10).

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

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

(c) All revenues collected in connection with the operation of the Colorado River storage project and participating projects shall be credited to the Basin Fund, and shall be available, without further appropriation, for (1) defraying the costs of operation, maintenance, and replacements of, and emergency expenditures for, all facilities of the Colorado River storage project and participating projects, within such separate limitations as may be included in annual appropriation acts: *Provided*, That with respect to each participating project, such costs shall be paid from revenues received from each such project; (2) payment as required by subsection (d) of this section; and (3) payment as required by subsection (e) of this section. Revenues credited to the Basin Fund shall not be available for appropriation for construction of the units and participating projects authorized by or pursuant to this Act.

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

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

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

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

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

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

Revenues so apportioned to each State shall be used only for the repayment of construction costs of participating projects or parts of such projects in the State to which such revenues are apportioned and shall not be used for such purpose in any other State without the consent, as expressed through its legally constituted authority, of the State to which such revenues are apportioned. Subject to such requirement, there shall be paid annually into the general fund of the Treasury from the revenues apportioned to each State (1) the costs of each participating project herein authorized (except Paonia) or any separable feature thereof, which are allocated to irrigation pursuant to section 6 of this Act, within a period not exceeding fifty years, in addition to any development period authorized by law, from the date of completion of such participating project or separable feature thereof, or, in the case of Indian lands, payment in accordance with section 4 of this Act; (2) costs of the Paonia project, which are beyond the ability of the water users to repay, within a period prescribed in the Act of June 25, 1947 (61 Stat. 181); and (3) costs in connection with the irrigation features of the Eden project as specified in the Act of June 28, 1949 (63 Stat. 277).

(f) The interest rate applicable to each unit of the storage project and each participating project shall be determined by the Secretary of the Treasury as of the time the first advance is made for initiating construction of said unit or project. Such interest rate shall be determined by calculating the average yield to maturity on

the basis of daily closing market bid quotations during the month of June next preceding the fiscal year in which said advance is made, on all interest-bearing marketable public debt obligations of the United States having a maturity date of fifteen or more years from the first day of said month, and by adjusting such average annual yield to the nearest one-eighth of 1 per centum.

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

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

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

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

Sec. 9. Nothing contained in this Act shall be construed to alter, amend, repeal, construe, interpret, modify, or be in conflict with the provisions of the Boulder Canyon Project Act (45 Stat. 1057),[57] the Boulder

[57] 43 U.S.C.A. § 617 et seq.

Canyon Project Adjustment Act (54 Stat. 774),[58] the Colorado River Compact, the Upper Colorado River Basin Compact, the Rio Grande Compact of 1938, or the Treaty with the United Mexican States (Treaty Series 994).

Sec. 10. Expenditures for the Flaming Gorge, Glen Canyon, Curecanti, and Navajo initial units of the Colorado River storage project may be made without regard to the soil survey and land classification requirements of the Interior Department Appropriation Act, 1954.[59]

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

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

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

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

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

Sec. 16. As used in this Act—

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

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

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

The term "Upper Colorado River Basin Compact" shall mean that certain compact executed on October 11, 1948 by commissioners representing the States of Arizona, Colorado, New Mexico, Utah, and Wyoming, and consented to by the Congress of the United States of America by Act of April 6, 1949 (63 Stat. 31);[60]

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[58] 43 U.S.C.A. § 618 et seq.

[59] 16 U.S.C.A. §§ 17b—1, 460c note; 43 U.S.C.A. §§ 50, 377a, 390a, 775; 48 U.S.C.A. §§ 1401f, 1409 note, 1423*l*, 1434-1437, 1439.

[60] 43 U.S.C.A. § 617*l* note.

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

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

Approved April 11, 1956.

APPENDIX II - COLORADO RIVER WATER DELIVERY CONTRACTS

The texts of the major water delivery contracts between the United States and the States of Arizona and Nevada and between the United States and the major water using entities in California entered into pre-1948 appear in "The Hoover Dam Documents - Wilbur and Ely, 1948."

Appendix 201 -Calendar Year 1977.
Compilation of Records in Accordance with Article V of the Decree of the Supreme Court of the United States in *Arizona* v. *California* dated March 9, 1964.

202 -Gila Reauthorization Act.

201

UNITED STATES
DEPARTMENT OF THE INTERIOR
Cecil D. Andrus, Secretary

BUREAU OF RECLAMATION
R. Keith Higginson, Commissioner

LOWER COLORADO REGION
Manuel Lopez., Jr., Regional Director

COMPILATION OF RECORDS IN ACCORDANCE WITH ARTICLE V OF THE DECREE OF THE SUPREME COURT OF THE UNITED STATES IN ARIZONA v. CALIFORNIA DATED MARCH 9, 1964

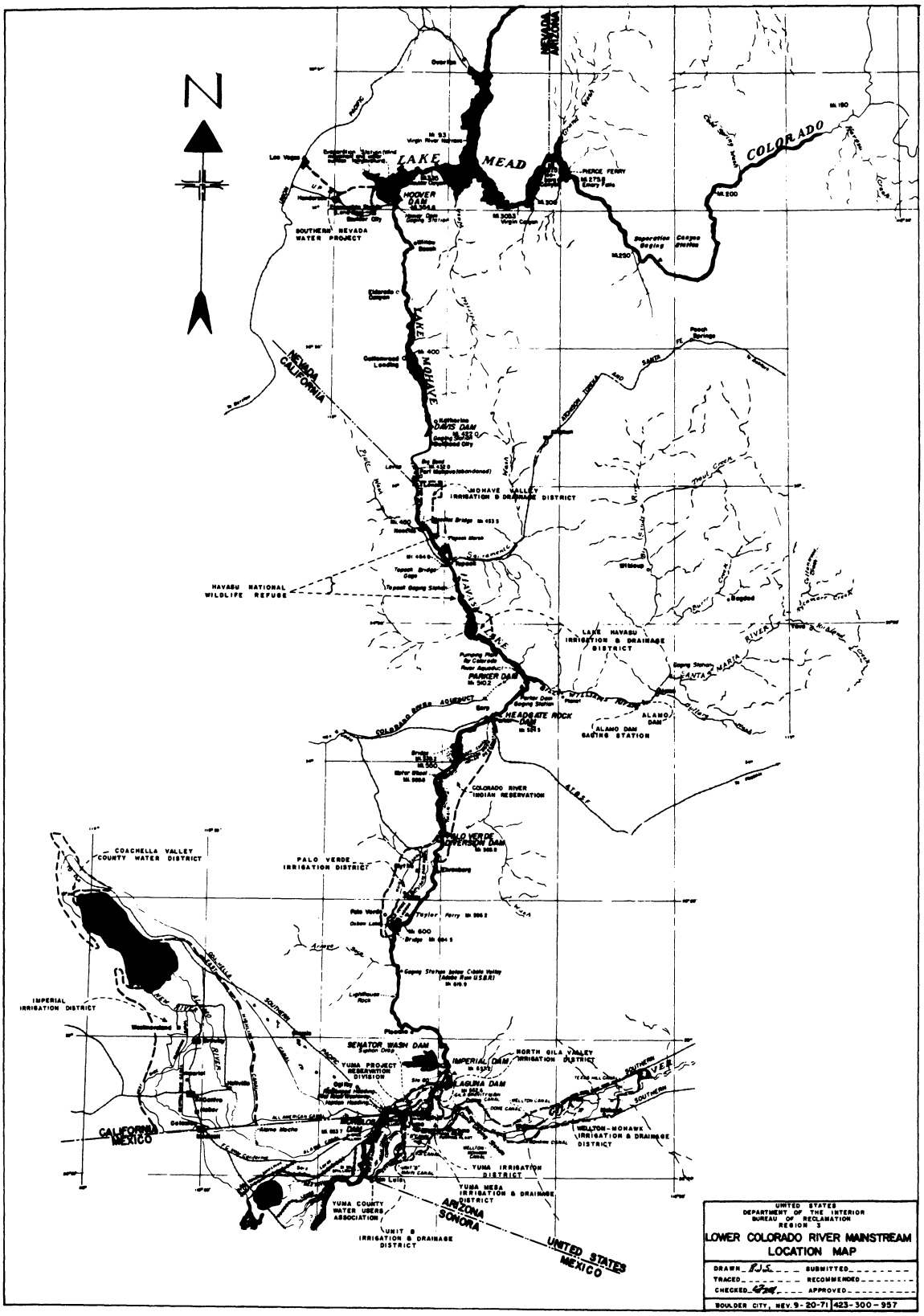
CALENDAR YEAR 1977

Division of Water and Land Operations
Boulder City, Nevada

October 15, 1978

CONTENTS

		Page
Location Map (Drawing No. 423-300-957)		Frontispiece
V(A)	Releases of Water Through Regulatory Structures	1
	Controlled by the United States	3
V(B)	Mainstream Diversions, Return Flows, and Consumptive Use	4
	Arizona	7
	Other Arizona Users	11
	California	16
	Other California Users	19
	Nevada	22
V(C)	Water Ordered but not Diverted	24
	Arizona	27
	California	30
V(D)	Deliveries of Water to Mexico	32
V(E)	Diversions and Use for Gila National Forest	34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LAKE MEAD
HOOVER DAM
SOUTHERN NEVADA WATER PROJECT
LAKE MOHAVE
DAVIS DAM
MOHAVE VALLEY IRRIGATION & DRAINAGE DISTRICT
HAVASU NATIONAL WILDLIFE REFUGE
LAKE HAVASU
PARKER DAM
LAKE HAVASU IRRIGATION & DRAINAGE DISTRICT
HEADGATE ROCK DAM
ALAMO DAM
COLORADO RIVER INDIAN RESERVATION
PALO VERDE DIVERSION DAM
PALO VERDE IRRIGATION DISTRICT
COACHELLA VALLEY COUNTY WATER DISTRICT
IMPERIAL IRRIGATION DISTRICT
SENATOR WASH DAM
YUMA PROJECT RECLAMATION DIVISION
IMPERIAL DAM
NORTH GILA VALLEY IRRIGATION DISTRICT
LAGUNA DAM
WELLTON-MOHAWK IRRIGATION & DRAINAGE DISTRICT
YUMA IRRIGATION DISTRICT
YUMA MESA IRRIGATION & DRAINAGE DISTRICT
YUMA COUNTY WATER USERS ASSOCIATION
UNIT B IRRIGATION & DRAINAGE DISTRICT
CALIFORNIA
NEVADA
ARIZONA
MEXICO
SONORA
UNITED STATES
COLORADO RIVER
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
REGION 3
LOWER COLORADO RIVER MAINSTREAM
LOCATION MAP
DRAWN RJS
SUBMITTED
TRACED
RECOMMENDED
CHECKED
APPROVED
BOULDER CITY, NEV. 9-20-71 423-300-957

RECORDS OF RELEASES OF WATER THROUGH REGULATORY STRUCTURES IN ACCORDANCE WITH ARTICLE V(A) OF THE DECREE OF THE SUPREME COURT OF THE UNITED STATES IN ARIZONA v. CALIFORNIA DATED MARCH 9, 1964

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CALENDAR YEAR 1977

The following tabulations for calendar year 1977 show final records of releases of water through regulatory structures controlled by the United States. At Hoover, Davis, Parker, Palo Verde, Imperial, and Laguna Dams, the records are furnished by the Geological Survey based on measurements at or below the structures.

The record of riverflow through Headgate Rock Dam was computed using the record of flow at the gaging station "Colorado River below Parker Dam, Arizona-California," and deducting from it the record of flow at the gaging station "Diversions for Colorado River Indian Reservation, near Parker, Arizona." The diversions are made at Headgate Rock Dam.

RELEASE OF WATER THROUGH REGULATORY STRUCTURES
CONTROLLED BY THE UNITED STATES

V(A)

CALENDAR YEAR 1977

(ACRE - FEET)

WATER USER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Hoover Dam	250,400	60E,300	E54,100	9EE,000	760,600	720,100	E92,500	E75,900	469,300	42E,400	462,600	562,800	7,E73,000
Davis Dam	304,700	626,500	E39,E00	967,700	790,000	914,400	1,092,000	7E7,E00	54E,600	46E,400	407,900	427,300	E,175,000
Parker Dam	257,500	49E,500	6E3,000	E11,600	651,900	760,300	956,200	6E7,600	46C,300	347,800	28E,100	30E,500	6,711,000
Headgate Rock Dam 1	250,900	451,200	624,E00	754,400	593,000	6E3,600	E72,500	613,100	406,500	315,500	263,000	287,700	6,116,000
Palo Verde Dam 2/	21E,700	369,900	523,700	622,900	476,300	551,200	726,E00	524,600	349,000	273,400	224,000	255,700	5,116,000
Imperial Dam 3/	3E,640	23,560	19,75C	22,690	44,920	25,44C	24,230	57,430	50,640	16,E90	19,340	21,59C	365,200
Laguna Dam	41,140	24,980	20,970	23,440	45,580	27,E40	23,510	57,080	49,920	17,630	20,260	21,790	374,100

1/ Colorado River below Parker Dam less diversions at Headgate Rock Dam.

2/ Measured through river gates at Palo Verde Dam.

3/ Includes diversion to Mittry Lake.

RECORDS OF DIVERSIONS, RETURN FLOWS, AND CONSUMPTIVE USE IN ACCORDANCE WITH ARTICLE V(B) OF THE DECREE OF THE SUPREME COURT OF THE UNITED STATES IN ARIZONA v. CALIFORNIA DATED MARCH 9, 1964

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CALENDAR YEAR 1977

The following tabulations for calendar year 1977 show final records of diversions of water from the mainstream of the Colorado River, return flow of such water to the mainstream and consumptive use of such water by water user agencies which have contracts with the United States. The records were furnished by the Geological Survey, International Boundary and Water Commission, Bureau of Indian Affairs, Bureau of Reclamation, National Park Service, Fish and Wildlife Service, and water user agencies. Diversions to All-American Canal and Gila Gravity Main Canal at Imperial Dam were assigned to each user based on deliveries to each user at its turnout from the canal and a prorated amount of the conveyance loss from the canal. The loss proration was based on the quantity delivered to each user and the length of the canal through which it was carried.

The tables also show estimates of water use by water users other than those which have contracts with the United States. Records of quantities of water pumped by permittees under the Lower Colorado River Land Use Program and by others are incomplete or not available. Consequently, estimates of pumpage from the mainstream, from both the river and the underground, are shown for each State. Pumping from the underground was considered from only those wells located in the flood plain of the Colorado River between the toes of the slopes on either side of the valley. Supplemental sheets are enclosed which show the estimates of water pumped by each diverter between Davis Dam and the International Boundary.

The estimate of diversion by pumping during 1977 was made by two basic methods: (1) For most electric pumps, diversion was computed on a monthly basis from power records and a "kWh per acre-foot factor" that was determined by discharge measurements; (2) For pumps other than electric, a factor of 6 acre-feet per irrigated acre per year was used. Irrigated acres were determined by field inventory during the year made with the aid of aerial photographs which were taken during May - August 1976.

There are undetermined amounts of unmeasured return flow reaching the Colorado River by means of underground flow from aquifers underlying water use areas. A Task Force on Ground-Water Return Flows to the Lower Colorado River, consisting of State and Federal members, was organized during 1970 to provide advice and guidance to the Bureau of Reclamation and the Geological Survey which are jointly conducting a program to determine the location and amounts of such unmeasured return flows. When quantities are determined, it is anticipated that such amounts will be credited to the affected users and States in making the consumptive use computations.

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977
STATE OF ARIZONA

V(B)

ACRE FEET Sheet 1 of 4

WATER USER		JANUARY	FEBRUARY	MARCH	APRI	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS	
Lake Mead National Recreation Area Diversion from Lake Mohave	Diversion Return Consumptive Use	8	11	12	19	16	28	40	35	31	24	16	11	251	1/
Davis Dam and Government Camp Diversion at Davis Dam	Diversion Return Consumptive Use	14	16	15	14	18	23	26	27	19	14	12	11	211	1/
Mohave Valley Irrigation and Drainage District pumped from wells and inlet channel to Havasu National Wildlife Refuge	Diversion Return Consumptive Use	247	659	1,175	3,236	2,456	3,287	5,115	4,438	2,436	722	739	426	24,936	1/
Fort Mohave Indian Reservation Pumped from wells	Diversion Return Consumptive Use	0	0	0	4,273	1,374	2,357	1,126	1,957	1,983	1,211	1,877	1,291	17,449	1/
Havasu National Wildlife Refuge Inlet - NW¼NE¼NW¼, Sec. 33, T. 9 N., R. 22 E., G&SRM	Diversion	0	0	7,557	978	3,055	5,088	4,122	5,284	5,441	4,516	1,142	2,100	38,263	
Less diversion from Inlet Channel pumped in SE¼SW¼SE¼, Sec. 24, T. 17 N., R. 22 W., G&SRM	Diversion	0	0	112	330	246	329	522	449	243	65	68	36	2,400	
1 well - NE¼NE¼NE¼, Sec. 15, T. 8 N., R. 23 E., G&SRM	Diversion Return Consumptive Use	0 157 -157	0 0 0	12 0 7,457	2 0 650	3 0 1,812	8 0 4,767	7 0 3,607	8 0 843	9 0 5,207	7 0 4,458	2 4,104 3,028	3 0 2,067	61 4,261 31,683	
Lake Havasu Irrigation and Drainage District pumped from wells	Diversion Return Consumptive Use	340	370	450	557	951	992	867	814	734	508	506	435	7,524	1/
Graham Water Utilities, Inc.	Diversion Return Consumptive Use	0	0	0	6	9	10	11	11	10	8	7	7	79	1/
Holiday Harbor Utilities Company	Diversion Return Consumptive Use	0	0	0	1	0	0	1	0	1	0	0	0	3	1/
Town of Parker 1 well - NW¼NW¼NW¼, Sec. 7, T. 9 N., R. 19 W., G&SRM	Diversion Return Consumptive Use	43	48	61	73	74	37	111	103	88	69	52	43	862	1/

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977
STATE OF ARIZONA

V(B)

ACRE FEET Sheet 2 of 4

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS	
Colorado River Indian Reservation															
Diversion at Headgate Rock Dam	Diversion	6,748	47,249	58,212	57,230	58,930	76,702	83,704	74,465	53,781	32,280	25,064	20,800	595,165	
Pumped from 2 wells at Parker	Diversion	2	3	4	5	5	6	7	7	6	3	4	2	54	
SW¼NE¼SE¼, Sec. 2, T. 9 N., R. 21 W., G&SRM															
4 Wells in Poston															
NW¼, Sec. 36, T. 8 N., R. 21 W., G&SRM	Diversion	3	4	4	5	6	7	8	8	7	6	4	3	65	
3 pumps															
SW¼SW¼NE¼, Sec. 14, T. 5 N., R. 22 W., G&SRM	Diversion	217	3,129	864	706	1,673	1,760	2,528	1,564	936	672	41	623	14,713	
3 pumps															
NE¼SW¼NW¼, Sec. 14, T. 4 N., R. 22 W., G&SRM	Diversion	250	388	689	684	824	541	536	431	634	674	682	449	6,782	
1 well Hatch Center	Diversion	1	1	1	1	2	2	2	2	2	1	1	1	17	
	Return	14,867	16,952	23,067	24,949	25,473	24,325	27,558	29,085	27,653	21,927	19,824	18,054	273,734	
	Consumptive Use	-7,646	33,822	36,707	33,682	35,967	54,693	59,227	59,227	47,392	27,713	11,709	5,972	343,062	
Cibola National Wildlife Refuge	Diversion	146	818	806	1,117	1,031	1,302	1,289	1,588	691	1,145	875	570	11,378	1/
	Return														
	Consumptive Use														
Imperial National Wildlife Refuge															
2 wells	Diversion													155	
NW¼NW¼NW¼, Sec. 13, T. 5 S., R. 22 W., G&SRM	Return														1/
SW¼NE¼SW¼, Sec. 13, T. 5 S., R. 22 W., G&SRM	Consumptive Use														
Yuma Proving Ground															
Diversion at Imperial Dam	Diversion	0	6	0	0	0	1	3	1	2	5	0	0	18	
	Return														1/
	Consumptive Use														
North Gila Valley Irrigation District	Diversion	1,648	6,288	3,220	4,218	5,236	5,821	6,082	4,965	3,802	2,751	2,875	2,599	49,505	
Diversion at Imperial Dam	Return	459	645	605	527	590	661	818	687	765	667	600	328	7,352	
	Consumptive Use	1,189	5,643	2,615	3,691	4,646	5,160	5,264	4,278	3,037	2,084	2,275	2,271	42,153	
Warren Act Contractors	Diversion	0	0	0	0	182	439	118	0	0	0	0	0	739	
Diversion at Imperial Dam	Return														1/
	Consumptive Use														
Wellton-Mohawk Irrigation and Drainage District	Diversion	14,522	34,090	38,873	48,454	43,055	52,563	59,681	46,484	39,446	26,001	24,056	17,211	444,436	
Diversion at Imperial Dam	Return	18,522	16,713	10,584	17,544	16,868	17,604	18,076	17,818	17,377	18,302	16,713	18,107	204,228	1
	Consumptive Use	-4,000	17,377	28,289	30,910	26,187	34,959	41,605	28,666	22,069	7,699	7,343	-896	240,208	

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW

AND CONSUMPTIVE USE OF SUCH WATER

CALENDAR YEAR 1977

STATE OF ARIZONA

V(B)

ACRE FEET Sheet 3 of 4

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS	
Yuma Irrigation District	Diversion	2,292	5,765	5,310	6,319	5,205	6,176	7,957	6,449	5,534	3,620	3,647	2,186	60,460	
Diversion at Imperial Dam	Diversion	712	1,055	1,111	1,323	1,427	1,405	1,774	1,808	2,649	918	820	705	15,707	
Diversion from private wells	Return														
	Consumptive Use														
Yuma Mesa Irrigation and Drainage District	Diversion	0,526	10,536	16,056	18,242	20,905	27,698	29,853	21,458	23,271	15,796	12,145	9,020	211,508	5/
Diversion at Imperial Dam	Return														
	Consumptive Use														
Unit B Irrigation and Drainage District	Diversion	1,092	1,828	3,003	3,160	3,853	4,788	4,85[illegible]	3,503	3,744	2,891	2,54[illegible]	1,662	36,726	6/
Diversion at Imperial Dam	Return														
	Consumptive Use														
Returns from South Gila Valley	Returns	3,531	4,791	5,676	6,860	4,411	4,758	6,757	5,535	3,753	2,641	2,829	5,003	56,525	4/
City of Yuma	Diversion	686	845	1,005	1,233	1,273	1,573	1,722	1,457	1,295	1,113	927	769	13,898	
Diversion at Imperial Dam	Return	547	430	507	493	431	432	439	482	477	491	500	457	5,686	
	Consumptive Use	139	415	498	740	842	1,141	1,283	975	818	622	427	312	8,212	
Yuma County Water Users' Association	Diversion	13,008	24,209	26,121	27,750	25,142	36,011	41,022	21,707	19,883	17,667	11,526	9,928	273,974	7/
Diversion at Imperial Dam	Diversion	794	623	618	768	891	692	798	514	877	854	742	738	8,909	
Pumped from wells	Return	7,306	7,956	9,107	8,594	7,992	7,387	7,940	8,426	8,047	7,685	7,009	6,580	94,029	
	Consumptive Use	6,496	15,876	17,632	19,924	18,041	29,316	33,880	13,795	12,713	10,836	5,259	4,086	188,854	
Cocopah Indian Reservation	Diversion	5	0	209	96	113	84	181	93	151	29	0	10	971	
Diversion at Imperial Dam	Diversion	0	0	5	3	4	219	138	93	55	1	0	1	519	
Pumped from wells	Return														
	Consumptive Use														
Yuma Mesa Outlet Drain	Return	4,366	3,818	4,140	3,846	3,650	3,878	3,658	2,539	2,834	2,836	2,897	2,430	40,892	8/
Other Users Pumping from Colorado River	Diversion 9/	1,664	6,399	6,804	7,860	8,850	9,009	10,486	11,075	5,209	5,949	6,524	5,194	85,023	
and wells in flood plain	Return														1/
Davis Dam to International Boundary	Consumptive Use														

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW V(B)

AND CONSUMPTIVE USE OF SUCH WATER

CALENDAR YEAR 1977

STATE OF ARIZONA

(ACRE [illegible] Sheet 4 of 4

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Arizona Totals	Diversion	50,968	144,340	172,085	188,005	185,117	238,360	263,650	209,900	172,484	119,390	96,765	76,762	1,917,981 10/
	Returns	49,755	51,305	53,686	62,813	59,415	59,045	65,246	64,572	60,906	54,529	54,476	50,959	686,707
	Consumptive Use	1,213	93,035	118,399	125,192	125,702	179,315	198,404	145,328	111,578	64,861	42,289	25,803	1,231,274 10/

NOTE: The term "Consumptive Use" in this tabulation means measured diversions including underground pumping, less measured return flow and less current estimated unmeasured return flow to the river.

1/ No surface returns.
2/ Calculated from monthly power records.
3/ Included in 206,822 acre-feet delivered to Mexico in excess of minimum treaty requirements pursuant to provisions of Minute No. 242.
4/ Pumped from underground and unassigned to districts as returns include quantities of drainage from Yuma Mesa as well as from South Gila Valley.
5/ Includes deliveries to the following water users who have contracts with the United States.

Contractor	Point of Delivery	Annual Delivery (acre-feet)
City of Yuma	B3.7 Lateral	14
Desert Lawn Memorial	B3.7 Lateral	130
Southern Pacific Company	B3.7 Lateral	12
Southern Pacific Company	After bay of Yuma Mesa Pumping Plant	48
Yuma Mesa Fruit Growers Association	B3.7 W. Lateral	10
County of Yuma, Arizona	B3.8 Lateral	12
Marine Corps Air Station, Department of the Navy	B Canal and B-5.5 W. Lateral	2,041
TOTAL		2,267

6/ Includes deliveries to the following users who have contracts with the United States:

University of Arizona	B Main Canal	618
Camille Alec, Jr.	B-8 Lateral	32

7/ Includes deliveries to the following water users who have contracts with the United States:

Yuma Union High School District	Yuma Main Canal	1,138
City of Yuma - Smucker Park	Yuma Main Canal	109

8/ Returns include unknow quantities of drainage returns from Yuma Mesa Irrigation and Drainage District as well as from Yuma County Water Users' Association and Cocopah Indian Reservation.
9/ Details on Arizona Supplemental Sheets 1-5.
10/ The sum of the annual totals are 155 A.F. greater than the sum of the monthly totals due to the nonavailability of the monthly diversions of Imperial National Wildlife Refuge.

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW AND CONSUMPTIVE USE OF SUCH WATER

V(B)

CALENDAR YEAR 1977

STATE OF ARIZONA

(ACRE FEET) Sheet 1 of 5

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Clayton, Ralph														
2 pumps	Diversion	2	2	114	7	10	78	81	123	64	50	2	2	535 2/
SW¼SE¼SW¼, Sec. 34, T. 4 N., R. 22 W., G&SRM														
1 well	Diversion	0	0	1	1	2	19	1	4	2	2	1	1	34 2/
SW¼SW¼SW¼, Sec. 34, T. 4 N., R. 22 W., G&SRM														
Arkelian Farms														
2 pumps	Diversion	77	79	297	189	407	319	252	1,185	509	57	24	55	3,450 2/
SE¼SW¼SE¼, Sec. 16, T. 3 N., R. 22 W., G&SRM														
Sprall, A. Towery														
1 pump	Diversion													3,372
SE¼SW¼NW¼, Sec. 21, T. 1 N., R. 23 W., G&SRM														
Cibola Valley Irrigation and Drainage District														
3 pumps	Diversion	301	1,690	1,668	2,310	2,131	2,694	2,665	3,284	1,431	2,369	1,809	1,178	23,530 2/
SE¼SE¼NE¼, Sec. 20, T. 1 N., R. 23 W., G&SRM														
Swan, Ron	Diversion													1,623
Bishop, Louis														
1 pump	Diversion													990
NW¼SW¼SW¼, Sec. 31, T. 1 S., R. 23 W., G&SRM														
Martinez, Sam														
2 pumps	Diversion													481
NW¼NW¼SW¼, Sec. 1, T. 2 S., R. 24 W., G&SRM														
BLM Permittees														
Davis Dam to Imperial	Diversion													78
Subtotals - Davis Dam to Imperial Dam	Diversion 3/	380	1,771	2,080	2,507	2,550	3,110	2,999	4,596	2,006	2,478	1,836	1,236	27,549
	Diversion 4/	90	421	494	596	606	739	712	1,092	476	588	436	294	6,544

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW AND CONSUMPTIVE USE OF SUCH WATER

CALENDAR YEAR 1977

STATE OF ARIZONA

V(B)

ACRE FEET Sheet 2 of 5

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Pratt, Loren 1 well SW¼NW¼NE¼, Sec. 14, T. 7 S., R. 22 W., G&SRM	Diversion													226
1 pump SE¼SW¼NE¼, Sec. 14, T. 7 S., R. 22 W., G&SRM	Diversion													222
Mellon Farms, Inc. 1 pump SE¼SW¼NW¼, Sec. 14, T. 7 S., R. 22 W., G&SRM	Diversion	0	6	8	6	7	0	0	0	4	4	0	0	35 2/
Harp, Robert 1 well SE¼NE¼NE¼, Sec. 13, T. 8 S., R. 23 W., G&SRM	Diversion													1,458
Dulin, Arlin 1 well	Diversion													1,440
1 well SW¼NE¼SE¼, Sec. 8 T. 8 S., R. 22 W., G&SRM	Diversion	0	308	7	6	151	208	218	183	112	0	2	0	1,195 2/
Sturges, Steve 9 wells Sec. 18, T. 8 S., R. 21 W., and Sec. 13 and 14, T. 8 S., R. 22 W., G&SRM	Diversion	367	1,293	1,300	1,462	1,750	1,586	2,082	1,656	838	886	1,307	1,126	15,653 2/
Towelman, R. (Dulin A.) 1 well NW¼SW¼SW¼, Sec. 17, T. 8 S., R. 22 W., G&SRM	Diversion													720
Auza, Pete 1 well SE¼NW¼SW¼, Sec. 16, T. 8 S., R. 22 W., G&SRM	Diversion	0	58	72	147	116	199	260	212	184	86	171	108	1,613 2/
1 pump SE¼SE¼NE¼, Sec. 24, T. 8 S., R. 22 W., G&SRM	Diversion													1,380
1 well SE¼SE¼SE¼, Sec. 16, T. 8 S., R. 22 W., G&SRM	Diversion													1,380
Ott, Judd 1 well SE¼SW¼SW¼, Sec. 19, T. 8 S., R. 22 W., G&SRM	Diversion	27	62	49	27	32	48	69	67	27	21	26	37	492 2/
1 well NW¼NE¼NW¼, Sec. 30, T. 8 S., R. 22 W., G&SRM	Diversion	0	0	11	36	36	78	69	58	42	58	41	52	481 2/

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977
STATE OF ARIZONA

V(B)

ACRE FEET

Sheet 3 of 5

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Cameron Bros. 1 well SE¼NE¼SW¼, Sec. 24, T. 6 S., R. 22 W., G&SRM	Diversion	54	81	155	190	156	35	44	169	0	38	60	71	1,073 2/
Vukasovich 2 wells SE¼NE¼NE¼, Sec. 24, T. 6 S., R. 22 W., G&SRM SW¼SW¼SE¼, Sec. 24, T. 6 S., R. 23 W., G&SRM	Diversion	27	37	57	60	64	55	80	76	99	57	29	39	680 2/
Stanford, Robert L. 1 well SW¼SE¼SE¼, Sec. 22, T. 6 S., R. 23 W., G&SRM	Diversion	0	0	0	24	67	52	64	93	44	0	0	0	344 2/
Bingham Cattle Company 1 well NE¼SE¼SW¼, Sec. 23, T. 6 S., R. 23 W., G&SRM	Diversion	0	14	20	19	10	31	23	37	13	5	0	10	182 2/
Conraul, Le 1 well NE¼NE¼NE¼, Sec. 36, T. 9 S., R. 25 W., G&SRM	Diversion	47	157	128	155	226	191	240	64	0	121	339	259	1,927 2/
1 well NE¼NW¼NW¼, Sec. 31, T. 9 S., R. 24 W., G&SRM	Diversion	112	342	283	356	522	427	567	141	0	189	678	588	4,205 2/
Brand, Wayne 1 well NE¼NW¼NE¼, Sec. 35, T. 9 S., R. 25 W., G&SRM	Diversion													858
Sibley, Phil 1 well NE¼NW¼NW¼, Sec. 1, T. 10 S., R. 25 W., G&SRM	Diversion	33	128	228	245	212	63	334	120	152	79	44	83	1,721 2/
1 well NE¼SE¼NW¼, Sec. 2, T. 10 S., R. 25 W., G&SRM	Diversion													1,086
1 well NW¼SE¼NE¼, Sec. 14, T. 10 S., R. 25 W., G&SRM	Diversion	134	24	40	83	110	6	6	84	0	0	46	0	533 2/
Daniel, A. T. 1 pump SW¼SW¼NE¼, Sec. 33, T. 10 S., R. 25 W., G&SRM	Diversion													360
Cummings, C. & J. 1 well NW¼NE¼NW¼, Sec. 26, T. 10 S., R. 25 W., G&SRM	Diversion													960

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977

STATE OF ARIZONA

V(B)

ACRE FEET

Sheet 4 of 5

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Barkley, J. 1 well NE¼NW¼SW¼, Sec. 35, T. 10 S., R. 25 W., G&SRM	Diversion													360
Brown, Willis A. 1 well NE¼SW¼NW¼, Sec. 2, T. 11 S., R. 25 W., G&SRM	Diversion	0	179	28	57	39	59	104	85	20	0	0	13	584 2/
Hughes, Earl 1 well SW¼NW¼SE¼, Sec. 3 T. 11 S., R. 25 W., G&SRM	Diversion	0	91	201	120	175	188	103	236	209	163	156	0	1,644 2/
Munnaley, Slade 1 well NE¼SE¼SW¼, Sec. 26, T. 16 S., R. 22 E., SBM	Diversion	3	2	71	10	3	46	60	70	23	11	11	7	317 2/
Curtis, Armon 1 pump SW¼NE¼SE¼, Sec. 29, T. 16 S., R. 22 E., SBM	Diversion	0	0	0	10	0	0	4	15	4	4	0	0	37 2/
Power, Bill 1 pump SW¼SW¼NE¼, Sec. 30, T. 16 S., R. 22 E., SBM	Diversion													1,980
Ribelin (P. Power) 1 well NW¼NW¼NW¼, Sec. 30, T. 16 S., R. 23 E., SBM	Diversion													1,920
Hall, Ansil 1 pump NW¼SW¼NW¼, Sec. 36, T. 16 S., R. 21 E., SBM	Diversion													480
Yucca Powerplant 2 wells NW¼NW¼SW¼, Sec. 36, T. 16 S., R. 21 E., SBM NE¼SW¼NW¼, Sec. 36, T. 16 S., R. 21 E., SBM	Diversion													799
Burrell 1 well NW¼NE¼NW¼, Sec. 31, T. 8 S., R. 24 W., G&SRM	Diversion													192

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977
STATE OF ARIZONA

VUB

(ACRE FEET. Sheet 5 of 5

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Ranch 220 Trust 284 1 well SE¼NE¼NW¼, Sec. 19 T. 9 S., R. 24 W., GASRM	Diversion	6	51	124	131	122	133	158	162	54	130	0	65	1,136 2/
1 well NE¼SE¼NW¼, Sec. 19, T. 9 S., R. 24 W., GASRM	Diversion	7	35	71	73	68	81	101	97	30	73	1	37	674 2/
1 well NW¼SE¼NW¼, Sec. 19, T. 9 S., R. 24 W., GASRM	Diversion	6	32	63	62	59	71	84	86	25	62	0	31	581 2/
Arizona Subtotals Imperial Dam to International Boundary	Diversion 3/	823	2,900	2,916	3,279	3,925	3,557	4,670	3,713	1,880	1,987	2,931	2,526	35,107
	Diversion 4/	371	1,307	1,314	1,478	1,769	1,603	2,105	1,674	847	896	1,321	1,138	15,823
Arizona Totals	Diversion	1,664	6,399	6,804	7,860	8,850	9,009	10,486	11,075	5,209	5,949	6,524	5,194	85,023

1/ Calculated by assuming an annual diversion of 6 acre-feet per irrigated acre unless otherwise noted.
2/ Calculated from monthly power records and power-discharge measurements where available, and where power-discharge measurements were not available calculated from power-discharge rate.
3/ Total of items for which monthly distribution is shown.
4/ Total of items for which monthly distribution is not shown. Distributed according to monthly distribution of other users in immediate area.

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW AND CONSUMPTIVE USE OF SUCH WATER

V(B)

CALENDAR YEAR 1977

STATE OF CALIFORNIA

ACRE FEET

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Fort Mohave Indian Reservation														
Pumped from wells	Diversion	0	0	)	3,066	992	1,702	813	1,413	1,432	874	1,356	932	12,600
	Return													
	Consumptive Use													
City of Needles														
4 wells	Diversion	167	183	271	343	327	426	508	400	393	334	259	177	3,788
NW¼SW¼, Sec. 29, T. 9 N., R. 23 E., SBM	Return	43	41	54	46	59	84	97	93	103	59	62	38	779
	Consumptive Use	124	142	217	297	268	342	411	307	290	275	197	139	3,009
San Bernardino County														
1 well	Diversion	1	1	1	1	1	2	2	2	1	1	1	1	15
	Return													
	Consumptive Use													
Metropolitan Water District of Southern California														
Diversion from Lake Havasu	Diversion	57,895	97,844	114,763	110,509	116,597	113,018	118,001	113,969	89,786	117,528	113,706	116,982	1,280,598
	Return	342	306	332	300	295	273	292	298	300	323	312	334	3,707 7/
	Consumptive Use	57,553	97,538	114,431	110,209	116,302	112,745	117,709	113,671	89,486	117,205	113,394	116,648	1,276,891
Parker Dam and Government Camp														
Diversion at Parker Dam	Diversion	11	12	16	18	19	25	28	26	22	18	13	11	219
	Return	1	1	1	1	2	2	2	2	2	1	1	1	17
	Consumptive Use	10	11	15	17	17	23	26	24	20	17	12	10	202
Colorado River Indian Reservation 6/														
1 Well-Big River, Sec. 5, T. 1 S., R. 25 E., SBM	Diversion	0	1	1	1	1	1	1	2	1	1	0	0	10
1 pump, SW¼SW¼NW¼, Sec. 12, T. 17 N., R. 22 W., SBM	Diversion	34	50	76	156	80	237	244	204	166	56	67	48	1,398
1 pump, SW¼SW¼NW¼, Sec. 13, T. 3 S., R. 23 E., SBM	Diversion	28	81	59	54	110	135	140	111	136	81	92	46	1,073
1 pump, SW¼SE¼NW¼, Sec. 13, T. 3 S., R. 23 E., SBM	Diversion	0	107	25	146	162	179	180	82	215	113	142	134	1,485
1 pump, NE¼SW¼SE¼, Sec. 13, T. 3 S., R. 23 E., SBM	Diversion	71	83	80	169	181	189	230	113	370	198	196	167	2,047
1 pump, NE¼SW¼SE¼, Sec. 25, T. 3 S., R. 23 E., SBM	Diversion	0	0	0	138	27	78	127	144	82	6	0	0	602

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977
STATE OF CALIFORNIA

V(B)

ACRE FEET Sheet 2 of 3

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
1 pump, SE¼SE¼SE¼, Sec. 11, T. 4 S., R. 23 E., SBM	Diversion	0	71	57	0	0	102	132	61	53	0	0	0	476
1 pump, SE¼SE¼NW¼, Sec. 36, T. 4 S., R. 23 E., SBM	Diversion	6	33	36	50	72	86	87	49	61	18	74	17	589
1 pump, NW¼SE¼NW¼, Sec. 6, T. 5 S., R. 24 E., SBM	Diversion	0	0	0	127	9	112	94	104	54	0	0	0	500
1 pump, NW¼SE¼NW¼, Sec. 6, T. 5 S., R. 24 E., SBM	Diversion	0	0	0	205	14	233	207	337	107	0	0	0	1,103
1 pump, NE¼NE¼SE¼, Sec. 7, T. 5 S., R. 24 E., SBM	Diversion	0	0	208	164	20	465	520	389	107	0	0	0	1,873
1 pump, NE¼NW¼SE¼, Sec. 7, T. 5 S., R. 24 E., SBM	Diversion Return Consumptive Use	0	0	103	111	0	198	114	134	58	0	[illegible]	0	718 1/
Palo Verde Irrigation District Diversion at Palo Verde Dam	Diversion Return Consumptive Use	40,376 35,973 4,403	59,412 30,721 28,691	77,317 37,343 39,974	96,021 40,192 55,829	96,120 46,107 50,013	110,838 43,824 67,014	127,162 45,381 81,781	97,725 51,175 46,550	70,486 45,005 25,481	51,123 38,177 12,946	50,444 35,614 14,830	45,270 37,720 7,550	922,294 487,232 435,062
City of Blythe 10 wells in Secs. 29, 32, & 33, T. 6 S., R. 23 E., SBM	Diversion Return Consumptive Use	134	139	159	258	230	377	532	348	342	223	148	126	3,016 1/
East Blythe County Water District Pumped for domestic use from 23 wells one in NE¼SW¼NE¼ and other in NE¼SW¼SE¼ of Sec. 33, T. 6 S., R. 23 E., SBM	Diversion Return Consumptive Use	23	27	30	35	44	47	59	64	47	42	34	28	480 1/
Yuma Project Reservation Division Indian Unit Diversion at Imperial Dam	Diversion Return Consumptive Use	1,190	3,389	2,746	2,832	3,551	4,777	6,043	3,908	2,259	1,265	1,260	951	34,151
Yuma Project Reservation Division Bard Unit Diversion at Imperial Dam	Diversion Return Consumptive Use	1,020	3,684	3,248	3,692	3,979	6,645	6,911	4,978	3,535	2,311	2,056	1,795	43,854
Returns from Yuma Project Reservation Division Drains	Returns 2	1,058	1,799	1,980	1,841	2,129	2,161	2,262	1,863	1,830	1,438	1,490	1,654	22,405

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW V(B)
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977
STATE OF CALIFORNIA

(ACRE FEET) Sheet 3 of 3

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS	
Imperial Irrigation District Diversion at Imperial Dam	Diversion	132,503	187,912	277,938	318,347	288,312	292,331	363,218	235,092	218,141	183,424	151,577	123,267	2,772,062	
	Return														1/
	Consumptive Use														
Coachella Valley County Water District Diversion at Imperial Dam	Diversion	26,337	31,971	38,533	48,936	53,906	55,739	61,827	52,368	47,147	36,519	30,026	25,306	508,635	
	Return														1/
	Consumptive Use														
City of Winterhaven 1 well SE¼SE¼NE¼, Sec. 27, T. 16 S., R. 22 E., SBM	Diversion													110	3/
	Return														1/
	Consumptive Use														
Other users pumping from Colorado River and wells in flood plain Davis Dam to International Boundary 4/	Diversion	336	543	2,219	1,673	1,607	2,591	3,213	3,095	1,398	438	258	429	17,787	
	Return														1/
	Consumptive Use														
California Totals	Diversion	260,112	385,543	517,886	587,072	566,341	590,533	690,393	515,138	436,393	394,575	351,709	315,678	5,611,483	5/
	Return	38,317	32,868	39,710	42,380	48,592	46,344	48,034	53,431	47,240	39,998	37,479	39,747	514,140	
	Consumptive Use	221,795	352,675	478,176	544,692	517,749	544,189	642,359	461,707	389,153	354,577	314,230	275,931	5,097,343	5/

NOTE: The term "Consumptive Use" in this tabulation means measured diversions including underground pumping, less measured return flow and less current estimated unmeasured return flow to the river.

1/ No surface returns.
2/ Returns unassigned include unknown quantities of drainage from the Indian Unit and the Bard Unit in the Reservation Division but exclude seepage from the All-American Canal.
3/ Monthly distribution not available.
4/ Details on California Supplemental Sheets 1-3.
5/ The total is 110 acre-feet greater than the sum of monthly totals because of nonavailable monthly distribution of diversion by City of Winterhaven.
6/ Calculated from monthly power records and power-discharge measurement where available, and where power-discharge measurements were not available calculated from average power-discharge rate.
7/ Estimate based on measured regulatory reservoirs seepage returns less an estimated amount of phreatophyte use.

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW V(B)
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977
STATE OF CALIFORNIA

ACRE FEET Sheet 1 of 3

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Soto Brothers 1 well NW¼NW¼SE¼, Sec. 36, T. 11 N., R. 21 E., SBM	Diversion													840
Deason, Richard (Tri-State) 1 well NW¼NE¼NW¼, Sec. 31, T. 11 N., R. 22 E., SBM	Diversion													1,200
Lye, R. C. 1 well SE¼NE¼SW¼, Sec. 16, T. 1 S., R. 24 E., SBM	Diversion													66
BLM Permittees Pumped for domestic use	Diversion													107
Subtotals - Davis Dam to Imperial Dam	Diversion 2/	31	142	167	201	205	250	241	369	161	200	147	99	2,213 3/
Cole 1 well and 1 pump SW¼SE¼SE¼, Sec. 35, T. 15 S., R. 23 E., SBM	Diversion													636
Berryman, Harley 1 well	Diversion	3	0	87	18	69	89	159	248	121	43	0	0	937 3/
Power, Pete 2 wells NE¼NE¼NW¼, Sec. 15, T. 16 S., R. 23 E., SBM NW¼SW¼SW¼, Sec. 14, T. 16 S., R. 23 E., SBM	Diversion													1,992
Mitchell, Hayden 1 well SE¼SE¼NW¼, Sec. 22, T. 16 S., R. 23 E., SBM	Diversion	36	26	83	52	181	115	68	133	106	33	16	24	873 3/
Perez, F. (Slade) 1 well SE¼SW¼NW¼, Sec. 6, T. 6 S., R. 22 W., G&SRM	Diversion	8	165	90	345	28	264	182	150	165	0	0	0	1,417 3/
Barrett (R. Harry) 1 well SE¼SW¼NW¼, Sec. 6, T. 6 S., R. 22 W., G&SRM	Diversion													858
Spencer, M. E. 1 well SW¼NE¼SW¼, Sec. 9, T. 16 S., R. 23 E., SBM	Diversion	10	6	101	22	12	65	122	127	0	0	0	0	465 3/

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977
STATE OF CALIFORNIA

VUU

(ACRE FEET) Sheet 2 of 3

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS 1/
Coley, Marvin 1 well SE¼SE¼SW¼, Sec. 18, T. 16 S., R. 23 E., SBM	Diversion	70	0	102	63	187	68	181	103	0	0	0	0	774 3/
Martin, Marvin 1 pump NE¼NE¼SW¼, Sec. 1, T. 8 S., R. 23 W., GASRN	Diversion	0	0	0	0	0	6	5	6	7	0	0	0	24 3/
1 pump SE¼NE¼SW¼, Sec. 1, T. 8 S., R. 23 W., GASRN	Diversion	0	0	105	94	0	68	143	136	64	0	0	4	614 3/
Easterday, Anne 1 well SW¼SW¼SE¼, Sec. 1, T. 8 S., R. 23 W., GASRN	Diversion	0	5	128	14	11	94	95	106	7	0	0	0	460 3/
Harp, Robert 1 well SW¼NE¼SW¼, Sec. 2, T. 8 S., R. 23 W., GASRN	Diversion	0	0	127	0	0	114	186	219	44	0	0	0	690 3/
1 well NE¼NE¼SW¼, Sec. 2, T. 8 S., R. 23 W., GASRN	Diversion	13	48	85	76	100	151	214	162	101	0	0	0	950 3/
1 well NE¼NW¼SW¼, Sec. 12, T. 8 S., R. 23 W., GASRN	Diversion	7	7	92	32	79	131	124	47	5	17	5	32	578 3/
1 well SW¼NW¼SW¼, Sec. 12, T. 8 S., R. 23 W., GASRN	Diversion	0	0	56	1	0	51	39	71	39	2	0	0	299 3/
Taylor Bros. 1 well NW¼SW¼SW¼, Sec. 2, T. 8 S., R. 23 W., GASRN	Diversion	0	0	0	0	0	0	0	0	0	39	17	74	130 3/
F. Smith 1 well NW¼SW¼SE¼, Sec. 11, T. 8 S., R. 23 W., GASRN	Diversion													1,179
Dees, John F. 1 well SE¼NE¼SE¼, Sec. 12, T. 8 S., R. 23 W., GASRN	Diversion	61	59	122	153	232	241	278	230	184	136	74	78	1,848 3/
Easterday, Kenneth 1 well SW¼SE¼SW¼, Sec. 12, T. 8 S., R. 23 W., GASRN	Diversion	0	0	101	37	47	101	126	116	11	1	47	49	638 3/
Harp, Earl 1 well SW¼NE¼SE¼, Sec. 13, T. 8 S., R. 23 W., GASRN	Diversion													1,458

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW AND CONSUMPTIVE USE OF SUCH WATER

CALENDAR YEAR 1977

STATE OF CALIFORNIA

VIII

ACRE FEET Sheet 3 of 3

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS 1/
Musgrave, (Bartley Co.) 1 well NE¼SE¼SW¼, Sec. 19, T. 16 S., R. 23 E. SBM	Diversion													66
Hutcheson, John 1 pump SE¼SE¼SE¼, Sec. 27, T. 16 S., R. 23 E., SBM	Diversion	0	0	2	0	2	0	4	3	1	0	0	0	12 3/
Slade, William 1 pump SW¼SE¼SE¼, Sec. 29, T. 16 S., R. 23 E., SBM	Diversion	0	0	43	13	13	9	23	16	6	0	0	0	123 3/
Hudson, C. A. 1 pump NE¼SE¼SE¼, Sec. 29, T. 16 S., R. 22 E., SBM	Diversion	0	0	33	0	16	18	37	42	0	0	0	0	146 3/
G. & L. Farms (Cloud) 1 well NW¼SW¼SW¼, Sec. 29, T. 16 S., R. 22 E., SBM	Diversion	0	0	16	15	17	18	0	0	0	0	0	0	66 3/
Subtotals - Imperial Dam to Boundary	Diversion 4/	208	336	1,373	1,035	994	1,603	1,988	1,915	861	271	159	261	11,004
	Diversion 5/	128	207	846	638	613	988	1,225	1,180	531	167	99	161	6,783
Total California	Diversion	336	543	2,219	1,673	1,607	2,591	3,213	30,95	1,392	438	258	422	17,787

1/ Calculated by assuming an annual diversion of 6 acre-feet per irrigated acre unless otherwise noted.
2/ Record furnished by diverter.
3/ Calculated from monthly power records and power-discharge measurements where available, and where power-discharge measurements were not available calculated from average power-discharge rate.
4/ Total of items for which monthly distribution is shown.
5/ Total of items for which monthly distribution is not shown. Distributed according to monthly distribution of other users in immediate area.

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 1977
STATE OF NEVADA

V(B)

ACRE FEET Sheet 1 of 2

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS	
Boulder City															
Diversion at Hoover Dam	Diversion	72	9E	126	142	156	202	116	120	9E	70	7E	7E	1,356	
Diversion at Saddle Island, Lake Mead	Diversion 1/	6E	105	92	163	15E	288	449	373	311	271	162	105	2,545	2/
	Return														
	Consumptive Use														
Lake Mead Recreation Area															
Diversion from Lake Mead	Diversion	37	45	44	5E	6E	90	109	115	92	65	59	55	E37	
Diversion at Saddle Island, Lake Mead	Diversion 1/	P	P	3	5	3	7	10	9	4	5	3	P	55	
	Return														2/
	Consumptive Use														
Basic Management, Inc.															
Diversion at Saddle Island, Lake Mead	Diversion	52E	4E1	4EE	483	554	702	609	889	784	662	471	502	7,353	
	Return														2/
	Consumptive Use														
City of Henderson															
Diversion at Saddle Island, Lake Mead	Diversion 1/	9	11	13	1E	260	382	441	387	306	262	77	9	2,195	
Diversion at Saddle Island, Lake Mead	Diversion 1/	305	355	427	595	363	485	590	529	45E	379	391	337	5,214	
	Return														2/
	Consumptive Use														
Las Vegas Valley Water District															
Diversion at Saddle Island, Lake Mead	Diversion 1/	3,283	3,509	4,676	5,160	5,300	6,599	7,716	7,046	5,611	5,552	4,407	2,714	61,573	
	Return														2/
	Consumptive Use														
Nevada State Department of Fish and Game															
Diversion at Saddle Island, Lake Mead	Diversion 1/	355	321	417	354	344	331	342	34E	346	376	350	360	4,244	
	Return	355	321	416	354	343	330	341	347	346	376	350	360	4,239	
	Consumptive Use	0	0	1	0	1	1	1	1	0	0	0	0	5	
Johns-Manville Sales Corporation															
Diversion at Gypsum Wash, Lake Mead	Diversion	39	34	33	35	37	31	34	3E	44	43	43	47	45E	
	Return														2/
	Consumptive Use														
City of North Las Vegas															
Diversion at Saddle Island, Lake Mead	Diversion 1/	271	4E3	54E	712	606	770	88C	720	609	465	344	133	6,49E	
	Return														2/
	Consumptive Use														
Nellis Air Force Base															
Diversion at Saddle Island, Lake Mead	Diversion 1/	121	6E	11E	25E	19E	302	372	471	31L	242	150	113	2,714	
	Return														2/
	Consumptive Use														

DIVERSIONS FROM MAINSTREAM — AVAILABLE RETURN FLOW V(B)
AND CONSUMPTIVE USE OF SUCH WATER
CALENDAR YEAR 19[illegible]
STATE OF NEVADA

ACRE FEET Sheet 2 of 2

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS	
Ramelli, William O.															
Lot No. 3, Sec. 13, T. 32 S., R. 66 E., MDB&M	Diversion														4/
	Return														1/ 4/
Southern California Edison Company															
Diversion at Pumping Plant in Sec. 24, T. 32 S., R. 66 E., MDB&M	Diversion	1,376	767	841	1,254	1,375	1,438	1,440	1,529	1,457	1,110	1,129	611	14,327	
	Return														2/
	Consumptive Use														
Wiebke, Armin T.															
All except W. 500' and E. 630' of Lot No. 1, Sec. 33, T. 32 S., R. 66 E., MDB&M	Diversion														4/
	Return														1/ 4/
Portenier, Warren, E.															
E½, Lot No. 2, Sec. 33, T. 32 S., R. 66 E., MDB&M	Diversion													42	4/
	Return														1/ 4/
Welles, John C.															
1 Pump	Diversion														4/
E½, Lot No. 2, Sec. 33, T. 32 S., R. 66 E., MDB&M	Return														1/ 4/
Cavanagh, Milton E.															
1 Pump	Diversion														4/
W½, Lot No. 2, Sec. 33, T. 32 S., R. 66 E., MDB&M	Return														1/ 4/
RETURN FLOWS LAS VEGAS WASH RETURN	Returns	3,142	2,722	3,108	2,351	2,550	2,268	2,224	2,229	2,754	2,600	2,820	3,253	32,021	6/
Nevada Totals	Diversion	6,464	6,240	7,818	9,231	9,419	11,627	13,308	12,574	10,434	9,522	7,664	5,066	109,434	5/
	Return	3,497	3,043	3,524	2,705	2,693	2,598	2,565	2,576	3,100	2,976	3,170	3,613	36,260	
	Consumptive Use	2,969	3,197	4,294	6,526	6,526	9,029	10,743	9,998	7,334	6,546	4,494	1,453	73,174	5/

NOTE: The term "Consumptive Use" in this tabulation means measured diversions including underground pumping, less measured return flow and less current estimated unmeasured return flow to the river.

1/ Delivered through the facilities of the Southern Nevada Water Project.
2/ No surface return.
3/ Delivered through the facilities of Basic Management, Inc.
4/ Reports annually.
5/ The monthly totals do not add to the sum of the annual total because of nonavailability of items footnoted 5 .
6/ Estimate based on percentage of Colorado River water used in Las Vegas Valley.

APPENDIX II

RECORDS OF RELEASES OF MAINSTREAM WATER PURSUANT TO ORDERS BUT NOT DIVERTED BY PARTY ORDERING SAME AND QUANTITY OF SUCH WATER DELIVERED TO MEXICO IN SATISFACTION OF MEXICAN TREATY OR DIVERTED BY OTHERS IN ACCORDANCE WITH ARTICLE V(C) OF THE DECREE OF THE SUPREME COURT OF THE UNITED STATES IN ARIZONA v. CALIFORNIA DATED MARCH 9, 1964

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CALENDAR YEAR 1977

II-30 **UPDATING THE HOOVER DAM DOCUMENTS**

The following tabulations for calendar year 1977 show records of releases of mainstream water pursuant to orders therefore but not diverted by the party ordering the same, and the quantity of such water delivered to Mexico in satisfaction of the Mexican Treaty or diverted by others in satisfaction of decreed rights. Also shown are quantities of such rejected water delivered to Mexico in excess of Treaty requirements and quantities delivered to storage. The quantities delivered to storage were available to release for future use.

Water ordered but not diverted was analyzed daily for each diverter as the positive difference between the finally approved daily order and the mean daily delivery requested on the day the diversion was made. The monthly quantities shown on the tabulations are the sum of the daily positive quantities. Final approval of daily orders was given in advance of the delivery date by the amount of traveltime involved in conveying the water from the storage point to the diversion point on the mainstream. To the extent possible "water ordered but not diverted" was delivered to others in satisfaction of their rights. The quantities of such deliveries are shown on the tabulation.

Deliveries of water to Mexico in satisfaction of the Mexican Treaty were scheduled based on Mexico's daily orders. Releases from storage were scheduled in sufficient quantities which, when added to return flows, would meet Mexico's daily orders. Deliveries of water to Mexico in

satisfaction of the Treaty, therefore, were considered to have been made entirely from releases from storage and from return flows scheduled for that purpose and not from water ordered but not diverted by other Colorado River water users. Therefore, the tabulations show no "water ordered but not diverted" as being delivered to Mexico in satisfaction of the Treaty.

To date, no orders are received for diversions from the Colorado River in Nevada so no sheet is included for Nevada. The storage capacity of Lake Mead is so large in relation to the present daily diversions from the reservoir by Nevada that any "water ordered but not diverted" would be retained for future use and would have no significant effect on scheduling of daily operations of the reservoir.

RELEASES OF MAINSTREAM WATER PURSUANT TO ORDERS BUT NOT DIVERTED BY PARTY ORDERING SAME AND QUANTITY OF SUCH WATER DELIVERED TO MEXICO IN SATISFACTION OF MEXICAN TREATY OR DIVERTED BY OTHERS

V(C)

CALENDAR YEAR 1977

STATE OF ARIZONA

(ACRE - FEET)

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Colorado River Indian Reservation Diversion at Headgate Rock Dam	Ordered But Not Diverted	1,579	940	1,859	1,985	2,124	1,275	1,426	2,525	4,643	1,569	601	55E	21,194
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	169	3[illegible]	207	490	674	549	153	53E	117	157	149	133	3,374
	Delivered to Storage 2/	1,410	902	1,652	1,495	1,450	726	1,273	1,166	4,526	1,412	452	49E	16,962
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	821	0	0	0	37	85E
Yuma Proving Ground U.S. Army Diversion at Imperial Dam 1/	Ordered But Not Diverted	0	0	0	0	0	0	0	0	0	0	0	0	0
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	0	0	0	0	0	0	0	0	0	0	0	0	0
	Delivered to Storage 2/	0	0	0	0	0	0	0	0	0	0	0	0	0
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
North Gila Valley Irrigation District Diversion at Imperial Dam	Ordered But Not Diverted	885	579	926	994	1,842	609	687	1,785	468	880	998	90E	11,961
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	64	65	190	115	339	87	734	789	79	365	484	117	3,42E
	Delivered to Storage 2/	821	514	736	879	1,503	722	153	522	389	515	514	731	7,999
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	474	0	0	0	60	534
Warren Act Contractors Gila Project Districts Diversion at Imperial Dam	Ordered But Not Diverted	0	0	0	0	0	0	0	0	0	0	0	0	0
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	0	0	0	0	0	0	0	0	0	0	0	0	0
	Delivered to Storage 2/	0	0	0	0	0	0	0	0	0	0	0	0	0
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
Wellton-Mohawk I. and D.D. Diversion at Imperial Dam	Ordered But Not Diverted	5,300	1,976	3,695	186	3,289	464	1,329	9,324	5,466	3,602	3,422	8,559	46,619
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	323	554	520	18	595	151	272	111	865	742	496	71E	5,365
	Delivered to Storage 2/	4,977	1,422	3,175	168	2,694	313	1,057	1,19E	4,601	2,860	2,926	7,432	32,823
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	8,015	0	0	0	40C	8,424
Yuma Irrigation District	Ordered But Not Diverted	813	754	94E	405	1,031	866	425	1,115	819	1,372	1,081	1,2E7	10,916
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	36	125	23E	0	204	49	399	359	365	599	512	81	2,967
	Delivered to Storage 2/	777	629	710	405	827	817	26	119	454	773	569	1,15E	7,264
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	637	0	0	0	4E	6E5

RELEASES OF MAINSTREAM WATER PURSUANT TO ORDERS

BUT NOT DIVERTED BY PARTY ORDERING SAME

AND

QUANTITY OF SUCH WATER DELIVERED TO MEXICO IN SATISFACTION OF MEXICAN TREATY OR DIVERTED BY OTHERS

V(C)

CALENDAR YEAR 1977

STATE OF ARIZONA

(ACRE - FEET)

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Yuma Mesa I. and D.D. Diversion at Imperial Dam	Ordered But Not Diverted	1,813	1,033	1,725	1,736	1,476	607	690	4,459	2,620	1,434	1,299	2,586	21,460
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	42	258	462	445	290	153	411	405	399	357	212	65	3,499
	Delivered to Storage 2/	1,771	775	1,263	1,291	1,186	454	279	700	2,221	1,077	1,087	2,235	14,339
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	3,334	0	0	0	286	3,622
Unit B I and D.D. Diversion at Imperial Dam	Ordered But Not Diverted	178	101	129	172	222	184	175	896	278	172	145	591	3,243
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	0	28	0	101	30	28	66	97	60	49	44	91	594
	Delivered to Storage 2	178	73	129	71	192	156	109	121	218	123	101	409	1,860
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	678	0	0	0	91	769
City of Yuma Diversion at Imperial Dam	Ordered But Not Diverted	69	0	0	0	90	0	0	83	166	0	0	89	497
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	19	0	0	0	42	0	0	18	83	0	0	22	184
	Delivered to Storage 2/	50	0	0	0	48	0	0	17	83	0	0	61	259
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	48	0	0	0	6	54
Yuma County Water Users' Association Diversion at Imperial Dam	Ordered But Not Diverted	2,628	1,025	2,151	3,268	5,161	2,182	1,482	6,351	1,911	2,555	3,528	1,752	33,994
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	715	751	1,097	2,542	2,434	1,659	1,202	1,369	953	1,573	1,777	435	16,507
	Delivered to Storage 2/	1,913	274	1,054	726	2,727	523	280	1,326	958	982	1,751	1,204	13,718
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	3,657	0	0	0	112	3,769
Cocopah Indian Reservation Diversion at Imperial Dam	Ordered But Not Diverted	1	0	15	9	19	9	5	21	12	4	0	2	92
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	0	0	8	7	9	3	4	5	6	2	0	1	45
	Delivered to Storage 2/	1	0	7	2	10	1	1	4	6	2	0	1	35
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	12	0	0	0	0	12

RELEASES OF MAINSTREAM WATER PURSUANT TO ORDERS V(C)

BUT NOT DIVERTED BY PARTY ORDERING SAME

AND

QUANTITY OF SUCH WATER DELIVERED TO MEXICO IN SATISFACTION OF MEXICAN TREATY OR DIVERTED BY OTHERS

CALENDAR YEAR 1977

STATE OF ARIZONA

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Arizona Totals	Ordered But Not Diverted	13,266	6,406	11,448	8,755	15,254	6,391	6,419	26,539	16,382	11,588	11,074	16,444	149,969
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	1,368	1,819	2,722	3,718	4,617	2,679	3,241	3,691	2,927	3,844	3,674	1,663	35,963
	Delivered to Storage 2/	11,898	4,589	8,726	5,037	10,637	3,712	3,178	5,173	13,456	7,744	7,400	13,729	95,279
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	17,676	0	0	0	1,051	18,727

1/ No orders received.

2/ Available for future use.

RELEASES OF MAINSTREAM WATER PURSUANT TO ORDERS

BUT NOT DIVERTED BY PARTY ORDERING SAME

AND

QUANTITY OF SUCH WATER DELIVERED TO MEXICO IN SATISFACTION OF MEXICAN TREATY OR DIVERTED BY OTHERS

V(C)

CALENDAR YEAR 1977

STATE OF CALIFORNIA

(ACRE - FEET)

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Metropolitan Water District Diversion at Lake Havasu	Ordered But Not Diverted	0	156	2,927	3,491	1,203	982	0	3,831	0	272	294	0	13,156
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	0	0	0	0	0	0	0	0	0	0	0	0	0
	Delivered to Storage 1/	0	156	2,927	3,491	1,203	982	0	3,831	0	272	294	0	13,156
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
Palo Verde Irrigation District Diversion at Palo Verde Diversion Dam	Ordered But Not Diverted	1,166	2,693	1,767	1,426	863	442	1,394	3,582	3,382	2,602	3,318	786	23,423
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	135	647	407	290	95	149	224	347	54	256	377	282	3,463
	Delivered to Storage 1/	1,033	1,846	1,360	1,136	768	293	1,170	996	3,328	2,346	2,941	450	17,667
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	2,239	0	0	0	54	2,293
Yuma Project Reservation Division Bard Unit Diversion at Imperial Dam	Ordered But Not Diverted	989	325	692	437	597	149	379	1,144	519	381	497	713	6,822
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	617	221	585	346	309	52	302	236	215	185	264	312	3,644
	Delivered to Storage 1/	372	104	107	91	288	97	77	331	304	196	233	359	2,559
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	577	0	0	0	42	619
Yuma Project Reservation Division Indian Unit Diversion at Imperial Dam	Ordered But Not Diverted	1,167	304	573	324	526	113	333	947	338	220	328	401	5,574
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	728	206	484	257	272	39	265	195	140	107	174	176	3,043
	Delivered to Storage 1/	439	98	89	67	254	74	68	274	198	113	154	202	2,030
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	478	0	0	0	23	501
Imperial Irrigation District Diversion at Imperial Dam	Ordered But Not Diverted	2,567	579	2,371	682	1,555	2,132	0	35,340	6,510	3,126	0	6,833	61,895
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	302	250	557	216	0	30	0	480	2,382	0	0	4	4,221
	Delivered to Storage 1/	2,265	329	2,014	466	1,555	2,102	0	5,833	4,128	3,126	0	6,315	28,133
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	29,027	0	0	0	514	29,541
Coachella Valley County Water District Diversion at Imperial Dam	Ordered But Not Diverted	416	972	972	0	972	0	0	5,472	1,805	972	139	1,110	12,830
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	0	436	179	0	321	0	0	2,166	577	246	113	79	4,117
	Delivered to Storage 1/	416	536	793	0	651	0	0	248	1,228	726	26	857	5,481
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	3,058	0	0	0	174	3,232

RELEASES OF MAINSTREAM WATER PURSUANT TO ORDERS V(C)
BUT NOT DIVERTED BY PARTY ORDERING SAME
AND
QUANTITY OF SUCH WATER DELIVERED TO MEXICO IN SATISFACTION OF MEXICAN TREATY OR DIVERTED BY OTHERS
CALENDAR YEAR 1977
STATE OF CALIFORNIA

(ACRE - FEET)

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
California Totals	Ordered But Not Diverted	6,307	5,029	9,502	6,360	5,716	3,718	2,106	50,316	12,554	7,573	4,576	9,843	123,700
	Delivered to Mexico in Satisfaction of Treaty	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diverted by Others	1,782	1,960	2,212	1,109	997	270	791	3,424	3,366	794	928	853	18,488
	Delivered to Storage 1/	4,525	3,069	7,290	5,251	4,719	3,548	1,315	11,513	9,186	6,779	3,648	8,183	69,026
	Delivered to Mexico in Excess of Treaty	0	0	0	0	0	0	0	35,379	0	0	0	807	36,186

1/ Available for future use.

APPENDIX II

RECORDS OF DELIVERIES TO MEXICO OF WATER
IN SATISFACTION OF THE TREATY OF FEBRUARY 3, 1944,
AND WATER PASSING TO MEXICO IN EXCESS OF TREATY
REQUIREMENTS IN ACCORDANCE WITH ARTICLE V(D) OF THE
DECREE OF THE SUPREME COURT OF THE UNITED STATES
IN ARIZONA v. CALIFORNIA DATED MARCH 9, 1964

- -

CALENDAR YEAR 1977

DELIVERIES TO MEXICO IN SATISFACTION OF PART III OF 1944 TREATY
AND
WATER PASSING TO MEXICO IN EXCESS OF TREATY REQUIREMENTS

V(D)

CALENDAR YEAR 1977

(ACRE FEET)

WATER USER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Deliveries to Mexico in Satisfaction of Treaty	90,800	107,013	179,977	227,809	144,960	116,742	169,438	161,331	90,799	57,560	58,371	137,200	1,500,000
Passing to Mexico in Excess of Treaty requirements	18,610	16,800	10,994	18,271	16,954	17,933	18,400	84,197	19,987	18,732	17,359	20,667	278,904 1/

1/ Includes 206,822 acre-feet delivered pursuant to Minute 242.

APPENDIX II

RECORDS OF DIVERSIONS OF WATER

FROM THE MAINSTREAM OF THE GILA AND SAN FRANCISCO RIVERS

AND THE CONSUMPTIVE USE OF SUCH WATER, FOR THE BENEFIT

OF THE GILA NATIONAL FOREST IN ACCORDANCE WITH ARTICLE V(E)

OF THE DECREE OF THE SUPREME COURT OF THE UNITED STATES

IN ARIZONA v. CALIFORNIA DATED MARCH 9, 1964

— —

CALENDAR YEAR 1977

DIVERSIONS OF WATER FROM MAINSTREAM OF GILA AND SAN FRANCISCO RIVERS AND CONSUMPTIVE USE OF SUCH WATER FOR BENEFIT OF THE GILA NATIONAL FOREST

V(E)

CALENDAR YEAR 1977

(ACRE - FEET)

WATER USER		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTALS
Gila River	Diversion													0
	Consumptive Use													0
San Francisco River	Diversion													0
	Consumptive Use													0

[CHAPTER 382]

AN ACT

July 30, 1947
[S. 483]
[Public Law 272]

To relocate the boundaries and reduce the area of the Gila Federal reclamation project, and for other purposes.

Gila project.
Reduction in area.

40 U. S. C. §§ 401-404, 406-410, 413, 414; 23 U. S. C. § 9b; 7 U. S. C. § 607; 15 U. S. C. § 609b.
Ante, p. 208.

Redesignation.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of reclaiming and irrigating lands in the State of Arizona and other beneficial uses, the reclamation project known as Gila project, heretofore authorized and established under the provisions of the reclamation laws, the Act of June 16, 1933 (48 Stat. 195), and various appropriation Acts, is hereby reduced in area to approximately forty thousand irrigable acres of land (twenty-five thousand acres thereof situated on the Yuma Mesa and fifteen thousand acres thereof within the North and South Gila Valleys), or such number of acres as can be adequately irrigated by the beneficial consumptive use of no more than three hundred thousand acre-feet of water per annum diverted from the Colorado River, and as thus reduced is hereby reauthorized and redesignated the Yuma Mesa division, Gila project, and the Wellton-Mohawk division, Gila project, comprising approximately seventy-five thousand irrigable acres of land, or such number of acres as can be adequately irrigated by the beneficial consumptive use of no more than three hundred thousand acre-feet of water per annum diverted from the Colorado River, situate within the Wellton, Dome, Roll, Texas Hill, and Mohawk areas, is substituted for the land eliminated from the Yuma Mesa division and is hereby authorized: *Provided, however,* That the waters to be diverted and used thereby, and the lands and structures for the diversion, transportation, delivery, and storage thereof, shall be subject to the provisions of the Boulder Canyon Project Act of December 21, 1928, and subject to the provisions of the Colorado River compact signed at Santa Fe, New Mexico, November 24, 1922: *And provided further,* That the above limitations contained in this section are for the sole purpose of fixing the maximum acreage of the project and shall not be construed as interpreting, affecting, or modifying any interstate compact or contract with the United States for the use of Colorado River water or any Federal or State statute limiting or defining the right to use Colorado River water of or in any State.

Diversion of waters, etc.

45 Stat. 1057.
43 U. S. C. §§ 617-617t.
Ante, p. 57.
Purpose of limitations.

SEC. 2. The Secretary is hereby authorized to acquire in the name of the United States, at prices satisfactory to him, such lands, interests in lands, water rights, and other property within or adjacent to the Gila project, which belongs to the Gila Valley Power District or the Mohawk Municipal Water Conservation District, as he deems appropriate for the protection, development, or improvement of said project: *Provided, however,* That the prices to be paid for the lands owned by the Gila Valley Power District, of Arizona, and heretofore officially appraised at the direction of the Commissioner of Reclamation, for the existing facilities of said district and of the Mohawk

Acquisition of lands, etc.

Aggregate of prices.
Limitation.

Municipal Water Conservation District, of Arizona, heretofore officially appraised at his request and determined by him to be useful to said project, shall not, in the aggregate, exceed $380,000, and no portion thereof shall be paid until said districts have made arrangements satisfactory to the Secretary for the liquidation of their respective bonded, warrant, and other outstanding indebtedness.

Payment.

Sale of public lands, etc.

SEC. 3. The Secretary is hereby authorized, to the extent, in the manner, and on such terms as he deems appropriate for the protection, development, or improvement of the Gila project, to sell, exchange, or otherwise dispose of the public lands of the United States within said project, the lands acquired under this Act, and any improvements on any such lands and to lease the same during the presettlement period only, provided such lands shall be disposed of to actual settlers and farmers as soon as practicable; to establish town sites on such lands; and to dedicate portions of such lands for public purposes. Contracts for the sale of such lands shall be on a basis that, in the Secretary's judgment, will provide the return in a reasonable period of years of not less than the appraised value of the land and the improvements thereon or thereto. Such lands may be disposed of in farm units of such sizes as the Secretary determines to be adequate, taking into consideration the character of soil, topography, location with respect to the irrigation system, and such other factors as the Secretary deems relevant: *Provided*, That the area disposed of to an individual shall, so far as practicable, not exceed one hundred and sixty acres. Sales to any individual shall be of not more than one farm unit. Any sums received by the United States from the disposition of said lands and improvements shall be covered into the reclamation fund, and credited to construction costs.

Contracts.

Sales to individuals.

Application of State laws, etc.

SEC. 4. Beginning at such date or dates and subject to such provisions and limitations as may be fixed or provided by regulations which the Secretary is hereby authorized to issue, any public lands within the Gila project and any lands acquired under this Act shall be, after disposition thereof by the United States by contract of sale and during the time such contract shall remain in effect, (i) subject to the provisions of the laws of the State of Arizona relating to the organization, government, and regulation of irrigation, electrical, power, and other similar districts, and (ii) subject to legal assessment or taxation by any such district and by said State or political subdivisions thereof, and to liens for such assessments and taxes and to all proceedings for the enforcement thereof, in the same manner and to the same extent as privately owned lands: *Provided, however,* That the United States does not assume any obligation for amounts so assessed or taxed: *And provided further,* That any proceedings to enforce said assessments or taxes shall be subject to any title then remaining in the United States, to any prior lien reserved to the United States for unpaid installments under land-sale contracts made under this Act, and to any obligation for any other charges, accrued or unaccrued, for special improvements, construction, or operation and maintenance costs of said project.

Enforcement proceedings.

Repayment obligation.

SEC. 5. Notwithstanding any other provision of law, the general repayment obligation of any organization which may hereafter enter into a contract with the United States covering the repayment of any portion of the costs of construction of the Gila project may be spread in annual installments over such reasonable period, not exceeding sixty years, as the Secretary may determine. For the purpose of predicting the repayment obligations of the various lands within said project on their respective ability, as determined by the

Secretary, to share the burdens thereof, he may provide for the equitable apportionment of said general repayment obligation to the lands benefited on a unit basis in accordance with the extent of the benefit derived from the project, the character of soil, topography, and such other factors as he deems relevant, and he may provide for a system of variable payments under which larger annual payments will be required during periods of above-normal production or income and lesser annual payments will be required during periods of subnormal production or income.

Appropriations authorized.

SEC. 6. There are hereby authorized to be appropriated, from time to time, out of any money in the Treasury not otherwise appropriated, such moneys as may be necessary to carry out the provisions of this Act.

Authority of Secretary.

SEC. 7. The Secretary is authorized to perform such acts, to make such rules and regulations, and to include in contracts made under the authority of this Act such provisions as he deems proper for carrying out the provisions of this Act; and in connection with sales or exchanges under this Act, he is authorized to effect conveyances without regard to the laws governing the patenting of public lands. Wherever in this Act functions, powers, or duties are conferred upon the Secretary, said functions, powers, or duties may be performed, exercised, or discharged by his duly authorized representatives.

45 Stat. 1057; 54 Stat. 774.
43 U. S. C. §§ 617-617t, 618-618o.

SEC. 8. This Act shall be deemed a supplement to and part of the reclamation law. Nothing in this Act shall be construed to amend the Boulder Canyon Project Act of December 21, 1928, as amended by the Boulder Canyon Project Adjustment Act of July 19, 1940.

Approved July 30, 1947.

APPENDIX III - POWER CONTRACTS

The texts of the Hoover Dam "underwriting" contracts of 1930, the power contracts of 1931, the agency contract of 1941, the energy contracts of May 29, 1941, and November 23, 1945, appear in "The Hoover Dam Documents - Wilbur and Ely, 1948"

Appendix 301 - Lists of Power Contracts as of October 1, 1977, administered by DOE, BUR/REC, and jointly.

Exhibit G
Page 1 of 20

LIST OF POWER-RELATED AGREEMENTS CONTINUING UNDER ADMINISTRATION
OF
UNITED STATES DEPARTMENT OF INTERIOR, BUREAU OF RECLAMATION
AS OF OCTOBER 1, 1977

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Arizona Public Service Company			
a/ 14-06-300-2131	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project participation agreement.
b/ 14-06-300-2139	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project interconnection principles.
a/ 14-06-300-2271	3/23/76	*Navajo Project (Central Arizona Project)	Navajo Project co-tenancy agreement.
a/ 14-06-300-2272	3/23/76	*Navajo Project (Central Arizona Project)	Southern transmission system construction agreement.
a/ 14-06-300-2273	3/23/76	*Navajo Project (Central Arizona Project)	Western transmission system construction agreement.

a/ Multi-party agreement among: Arizona Public Service Company; City of Los Angeles, Department of Water and Power; Nevada Power Company; Salt River Project Agricultural Improvement and Power District; Tucson Gas & Electric Company; and United States.

b/ Multi-party agreement among: Arizona Public Service Company; City of Los Angeles, Department of Water and Power; Nevada Power Company; Salt River Project Agricultural Improvement and Power District; Southern California Edison Company; Tucson Gas & Electric Company and United States.

* The United States is a participant in the Navajo Project and, as such, has a power and energy entitlement therein, acquired for the ultimate purpose of serving the power needs of the Central Arizona Project.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Arizona Public Service Company (continued)			
a/ 14-06-300-2274	3/23/76	*Navajo Project (Central Arizona Project)	Navajo generating station construction agreement.
b/ 14-06-300-2299	5/21/73	*Navajo Project (Central Arizona Project)	Edison-Navajo transmission agreement.
a/ Coordinating Committee Agreements:			
No. 1	9/21/71	*Navajo Project (Central Arizona Project)	All risk insurance for Mohave SO_2 removal pilot plant.
No. 2	5/12/76	*Navajo Project (Central Arizona Project)	Interim compensation levels Navajo Project transmission system.
No. 3	5/4/77	*Navajo Project (Central Arizona Project)	Settlement of claim against Peabody Coal Company.
No. 4	10/15/76	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 5	4/21/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 6	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.

a/ See page 1.

b/ See page 1.

* See page 1.

Exhibit G
Page 3 of 20

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Arizona Public Service Company (continued)			
a/ Coordinating Committee Agreements: (continued)			
No. 7	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 8	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 9	5/12/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 10	9/7/77	*Navajo Project (Central Arizona Project)	Peabody Coal Company 1977 capital budget, mining and reclamation plans.
a/ Unnumbered	6/17/71	*Navajo Project (Central Arizona Project)	Memorandum of Recordation of effective date as 12/23/69 of Federal rights-of-way and easements for Navajo Project.
a/ Unnumbered	4/13/73	*Navajo Project (Central Arizona Project)	Dynamic participation signal agreement.
b/ Letter Agreement	4/17/74	*Navajo Project (Central Arizona Project)	Recovery of unit construction acceleration costs.
a/ Memorandum of Understanding (Letter Agreement)	5/15/70	*Navajo Project (Central Arizona Project	Southern transmission system interim insurance arrangement.

a/ See page 1.

b/ See page 1.

* See page 1.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: California-Pacific Utilities Company			
14-06-300-1171	5/8/68	Parker-Davis Project	Advancement of Funds for Tap on Davis 69-kV Swithchyard-California-Pacific Company Tap 69-kV line.
**Contractor: Continental Telephone Company			
14-06-300-496	3/7/56	Parker-Davis Project	Land lease and telephone service to Parker Dam.
Contractor: City of Los Angeles, Department of Water and Power			
c/ Ilr-1333	5/29/41	Boulder Canyon Project	Lease of Hoover Powerplant; Operation and maintenance.
I33r-1940	2/7/39	Boulder Canyon Project	Lease of telephone circuit.
a/ 14-06-300-2131	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project participation agreement.
b/ 14-06-300-2139	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project interconnection principles.
a/ 14-06-300-2271	3/23/76	*Navajo Project (Central Arizona Project)	Navajo Project co-tenancy agreement.

a/ See page 1.

b/ See page 1.

c/ Multi-party agreement among: City of Los Angeles, Department of Water and Power; Southern California Edison Company; and United States.

* See page 1.

** Formerly known as Golden West Telephone Company.

Exhibit G
Page 5 of 20

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: City of Los Angeles, Department of Water and Power (continued)			
a/ 14-06-300-2272	3/23/76	*Navajo Project (Central Arizona Project)	Southern transmission system construction agreement.
a/ 14-06-300-2273	3/23/76	*Navajo Project (Central Arizona Project)	Western transmission system construction agreement.
a/ 14-06-300-2274	3/23/76	*Navajo Project (Central Arizona Project)	Navajo generating station construction agreement.
b/ 14-06-300-2299	5/21/73	*Navajo Project (Central Arizona Project)	Edison-Navajo transmission agreement.
a/ Coordinating Committee Agreements:			
No. 1	9/21/71	*Navajo Project (Central Arizona Project)	All risk insurance for Navajo Mohave SO_2 removal pilot plant.
No. 2	5/12/76	*Navajo Project (Central Arizona Project)	Interim compensation levels for Navajo Project transmission system.
No. 3	5/4/77	*Navajo Project (Central Arizona Project)	Settlement of claim against Peabody Coal Company.

a/ See page 1.

b/ See page 1.

* See page 1.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: City of Los Angeles, Department of Water and Power (continued)			
a/ Coordinating Committee Agreements:			
No. 4	10/15/76	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 5	4/21/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 6	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 7	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 8	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 9	5/12/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 10	9/7/77	*Navajo Project (Central Arizona Project)	Peabody Coal Company 1977 capital budget, mining and reclamation plans.
a/ Unnumbered	6/17/71	*Navajo Project (Central Arizona Project)	Memorandum of Recordation of effective date as 12/23/69 of Federal rights-of-way and easements for Navajo Project.
a/ Unnumbered	4/13/73	*Navajo Project (Central Arizona Project)	Dynamic participation signal agreement.

a/ See page 1.

* See page 1.

Exhibit G
Page 7 of 20

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: City of Los Angeles, Department of Water and Power (continued)			
b/ Letter Agreement	4/17/74	*Navajo Project (Central Arizona Project)	Recovery of unit construction acceleration costs.
a/ Memorandum of Understanding (Letter Agreement)	5/15/70	*Navajo Project (Central Arizona Project)	Southern transmission system interim insurance arrangement.
Letter Agreement	3/1/76	Boulder Canyon Project	Amends Contract No. Ilr-1333 (LADWP; SCE; and United States).
Contractor: Division of Colorado River Resources, State of Nevada			
14-06-300-1333	1/30/63	Boulder Canyon Project	Enlarge generating section (Hoover).
Contractor: Imperial Irrigation District			
14-06-300-286	5/1/52	Boulder Canyon Project (All American Canal)	Operation and maintenance of Imperial Dam-Siphon Drop transmission line.
d/ 14-06-300-1381	6/1/65	Boulder Canyon Project/Parker-Davis Project/ Yuma	Use of water for generation.

a/ See page 1.

b/ See page 1.

d/ Multi-party agreement among: Imperial Irrigation District; Yuma County Water Users Association; and United States.

* See page 1.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Metropolitan Water District of Southern California			
Ilr-712	2/10/33	Boulder Canyon Project/Parker-Davis Project	Contract for cooperative construction and operation of Parker Powerplant.
e/ Ilr-1483	10/4/46	Boulder Canyon Project/Parker-Davis Project	Contract merging rights of San Diego City and County and the Metropolitan Water District of Southern California under contracts with the United States dated 2/15/33 and 4/24/30.
f/ 14-06-300-2346	6/14/72	None	Delivery of Mexican Treaty Waters.
14-06-300-2585	6/1/76	Boulder Canyon Project	Lease of telephone circuits.
Contractor: Mohave Electric Cooperative			
7-07-30-P0018	6/29/77	Parker-Davis Project	Construction, operation, and maintenance of Tap on Parker-Bagdad transmission line.

e/ Multi-party agreement among: City of San Diego; San Diego County Water Authority; Metropolitan Water District of Southern California; and United States.

f/ Multi-party agreement among: Metropolitan Water District; City of San Diego; San Diego County Water Authority; Otay Municipal Water District; Yuma County Water Users' Association; and United States.

Exhibit G
Page 9 of 20

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Nevada Power Company			
a/ 14-06-300-2131	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project participation agreement.
b/ 14-06-300-2139	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project interconnection principles.
14-06-300-2178	6/1/70	Boulder Canyon Project/Pacific Northwest-Pacific Southwest Intertie	Lease of telephone circuits.
a/ 14-06-300-2271	3/23/76	*Navajo Project (Central Arizona Project)	Navajo Project co-tenancy agreement.
a/ 14-06-300-2272	3/23/76	*Navajo Project (Central Arizona Project)	Southern transmission system construction agreement.
a/ 14-06-300-2273	3/23/76	*Navajo Project (Central Arizona Project)	Western transmission system construction agreement.
a/ 14-06-300-2274	3/23/76	*Navajo Project (Central Arizona Project)	Navajo generating station construction agreement.
b/ 14-06-300-2299	5/21/73	*Navajo Project (Central Arizona Project)	Edison-Navajo transmission agreement.

a/ See page 1.

b/ See page 1.

* See page 1.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Nevada Power Company (continued)			
a/ Coordinating Committee Agreements:			
No. 1	9/21/71	*Navajo Project (Central Arizona Project)	All risk insurance for Navajo Mohave SO_2 removal pilot plant.
No. 2	5/12/76	*Navajo Project (Central Arizona Project)	Interim compensation levels for Navajo Project transmission system.
No. 3	5/4/77	*Navajo Project (Central Arizona Project)	Settlement of claim against Peabody Coal Company.
No. 4	10/15/76	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 5	4/21/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 6	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 7	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 8	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.

a/ See page 1.

* See page 1.

Exhibit G
Page 11 of 20

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Nevada Power Company (continued)			
a/ Coordinating Committee Agreements: (continued)			
No. 9	5/12/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 10	9/7/77	*Navajo Project (Central Arizona Project)	Peabody Coal Company 1977 capital budget, mining and reclamation plans.
a/ Unnumbered	6/17/71	*Navajo Project (Central Arizona Project)	Memorandum of Recordation of effective date as 12/23/69 of Federal rights-of-way and easements for Navajo Project.
a/ Unnumbered	4/13/73	*Navajo Project (Central Arizona Project)	Dynamic participation signal agreement.
b/ Letter Agreement	4/17/74	*Navajo Project (Central Arizona Project)	Recovery of unit construction acceleration costs.
a/ Memorandum of Understanding (Letter Agreement)	5/15/70	*Navajo Project (Central Arizona Project)	Southern transmission system interim insurance arrangement.
Contractor: Otay Municipal Water District			
f/ 14-06-300-2346	6/14/72	None	Delivery of Mexican Treaty Waters.

a/ See page 1.

b/ See page 1.

f/ See page 8.

* See page 1.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Salt River Project Agricultural Improvement and Power District			
a/ 14-06-300-2131	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project participation agreement.
b/ 14-06-300-2139	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project interconnection principles.
a/ 14-06-300-2271	3/23/76	*Navajo Project (Central Arizona Project)	Navajo Project co-tenancy agreement.
a/ 14-06-300-2272	3/23/76	*Navajo Project (Central Arizona Project)	Southern transmission system construction agreement.
a/ 14-06-300-2273	3/23/76	*Navajo Project (Central Arizona Project)	Western transmission system construction agreement.
a/ 14-06-300-2274	3/23/76	*Navajo Project (Central Arizona Project)	Navajo generating station construction agreement.
b/ 14-06-300-2299	5/21/73	*Navajo Project (Central Arizona Project)	Edison-Navajo transmission agreement.

a/ See page 1.

b/ See page 1.

* See page 1.

Exhibit G
Page 13 of 20

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Salt River Project Agricultural Improvement and Power District (continued)			
a/ Coordinating Committee Agreements:			
No. 1	9/21/71	*Navajo Project (Central Arizona Project)	All risk insurance for Mohave SO_2 removal pilot plant.
No. 2	5/12/76	*Navajo Project (Central Arizona Project)	Interim compensation levels for Navajo Project transmission system.
No. 3	5/4/77	*Navajo Project (Central Arizona Project)	Settlement of claim against Peabody Coal Company.
No. 4	10/15/76	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 5	4/21/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 6	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 7	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 8	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.

a/ See page 1.

* See page 1.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Salt River Project Agricultural Improvement and Power District (continued)			
a/ Coordinating Committee Agreements: (continued)			
No. 9	5/12/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 10	9/7/77	*Navajo Project (Central Arizona Project)	Peabody Coal Company 1977 capital budget, mining and reclamation plans.
a/ Unnumbered	6/17/71	*Navajo Project (Central Arizona Project)	Memorandum of Recordation of effective date as 12/23/69 of Federal rights-of-way and easements for Navajo Project.
a/ Unnumbered	4/13/73	*Navajo Project (Central Arizona Project)	Dynamic participation signal agreement.
b/ Letter Agreement	4/17/74	*Navajo Project (Central Arizona Project)	Recovery of unit construction acceleration costs.
a/ Memorandum of Understanding (Letter Agreement)	5/15/70	*Navajo Project (Central Arizona Project)	Southern transmission system interim insurance arrangement.
Contractor: City of San Diego, California			
f/ 14-06-300-2346	6/14/72	None	Delivery of Mexican Treaty Waters.

a/ See page 1.

b/ See page 1.

f/ See page 8.

• See page 1.

Exhibit G
Page 15 of 20

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: City of San Diego, California (continued)			
e/ Ilr-1483	10/4/46	Boulder Canyon Project/Parker-Davis Project	Contract merging rights of San Diego City and County and the Metropolitan Water District of Southern California under contracts with the United States dated 2/15/33 and 4/24/30.
Contractor: San Diego County Water Authority			
f/ 14-06-300-2346	6/14/72	None	Delivery of Mexican Treaty Waters.
e/ Ilr-1483	10/4/46	Boulder Canyon Project/Parker-Davis Project	Contract merging rights of San Diego City and County and the Metropolitan Water District of Southern California under contracts with the United States dated 2/15/33 and 4/24/30.
Contractor: Southern California Edison Company			
c/ Ilr-1333	5/29/41	Boulder Canyon Project	Lease of Hoover Powerplant; Operation and maintenance.
b/ 14-06-300-2139	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project interconnection agreement.
b/ 14-06-300-2299	5/21/73	*Navajo Project (Central Arizona Project)	Edison-Navajo transmission agreement.

b/ See page 1.

c/ See page 4.

e/ See page 8.

f/ See page 8.

* See page 1.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Southern California Edison Company (continued)			
14-06-300-2619	8/20/76	Boulder Canyon	Lease of telephone circuits.
b/ Letter Agreement	4/17/74	*Navajo Project (Central Arizona Project)	Recovery of unit construction acceleration costs.
Letter Agreement	3/1/76	Boulder Canyon Project	Amends Contract No. Ilr-1333 (LADWP; SCE; and United States).
Contractor: Tucson Gas & Electric Company			
a/ 14-06-300-2131	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project participation agreement.
b/ 14-06-300-2139	9/30/69	*Navajo Project (Central Arizona Project)	Navajo Project interconnection principles.
a/ 14-06-300-2271	3/23/76	*Navajo Project (Central Arizona Project)	Navajo Project co-tenancy agreement.
a/ 14-06-300-2272	3/23/76	*Navajo Project (Central Arizona Project)	Southern transmission system construction agreement.
a/ 14-06-300-2273	3/23/76	*Navajo Project (Central Arizona Project)	Western transmission system construction agreement.
a/ 14-06-300-2274	3/23/76	*Navajo Project (Central Arizona Project)	Navajo generating station construction agreement.
b/ 14-06-300-2299	5/21/73	*Navajo Project (Central Arizona Project)	Edison-Navajo transmission agreement.

a/ See page 1.

b/ See page 1.

* See page 1.

Exhibit G
Page 17 of 20

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Tucson Gas & Electric Company (continued)			
a/ Coordinating Committee Agreements:			
No. 1	9/21/71	*Navajo Project (Central Arizona Project)	All risk insurance for Navajo Mohave SO_2 removal pilot plant.
No. 2	5/12/76	*Navajo Project (Central Arizona Project)	Interim compensation levels for Navajo Project transmission system.
No. 3	5/4/77	*Navajo Project (Central Arizona Project)	Settlement of claim against Peabody Coal Company.
No. 4	10/15/76	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 5	4/21/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 6	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 7	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 8	6/3/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.

a/ See page 1.

* See page 1.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Tucson Gas & Electric Company (continued)			
a/ Coordinating Committee Agreements: (continued)			
No. 9	5/12/77	*Navajo Project (Central Arizona Project)	Purchase of supplemental coal for Navajo generating station.
No. 10	9/7/77	*Navajo Project (Central Arizona Project)	Peabody Coal Company 1977 capital budget, mining and reclamation plans.
a/ Unnumbered	6/17/71	*Navajo Project (Central Arizona Project)	Memorandum of Recordation of effective date as 12/23/69 of Federal rights-of-way and easements for Navajo Project.
a/ Unnumbered	4/13/73	*Navajo Project (Central Arizona Project)	Dynamic participation signal agreement.
b/ Letter Agreement	4/17/74	*Navajo Project (Central Arizona Project)	Recovery of unit construction acceleration costs.
a/ Memorandum of Understanding (Letter Agreement)	5/15/70	*Navajo Project (Central Arizona Project)	Southern transmission system interim insurance arrangement.

a/ See page 1.

b/ See page 1.

* See page 1.

Exhibit G
Page 19 of 20

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Unit B Irrigation and Drainage District			
14-06-300-44	12/22/52	Yuma Auxiliary	Electric service for project purposes.
14-06-300-1274	8/22/62	Yuma Auxiliary	Amendment of Contract No. 14-06-300-44
Contractor: Wellton-Mohawk Irrigation and Drainage District			
Ilr-1591	3/4/52	Gila	Repayment contract; electric service.
14-06-300-1382	7/12/63	Gila	Construction, operation, and maintenance of facilities for transmission of energy.
Contractor: Western Arizona C.A.T.V.			
14-06-300-2261	11/2/71	Parker-Davis Project	Contract and license for erection and maintenance of community antenna, TV cable, and appurtenances on electric poles of United States.
Contractor: Yuma County Water Users' Association			
d/ 14-06-300-1381	6/1/65	Boulder Canyon Project/Parker-Davis Project/ Yuma	Use of water for generation.
14-06-300-1850	6/22/66	Yuma	Modification of drain.
14-06-300-2014	5/4/70	Yuma	Operation, maintenance, and replacement of electrical facilities for 12 drainage wells.

d/ See page 7.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Yuma County Water Users' Association (continued)			
I76r-671	6/15/51	Yuma	Operation and maintenance of works of Valley Division.
14-06-300-1317	11/15/62	Yuma	Operation and maintenance of irrigation facilities.
f/ 14-06-300-2346	6/1/65	None	Delivery of Mexican Treaty Waters.
Contractor: Yuma Irrigation District			
14-06-300-1270	7/23/62	Gila Project	Repayment contract; electric service.
14-06-300-1441	3/17/64	Colorado River Front Work and Levee System	Construction, operation, and maintenance of facilities for transmission of energy.
14-06-300-1506	12/29/64	Gila Project	Construction, operation, and maintenance of facilities for transmission of energy.
Contractor: Yuma-Mesa Irrigation and Drainage District			
14-06-W102	5/26/56	Gila Project	Repayment contract; electric service.

f/ See page 8.

Contracting Officer for the above agreements as of October 1, 1977:

Manuel Lopez, Jr.
Regional Director
Lower Colorado Region
Bureau of Reclamation
Department of the Interior
P.O. Box 427
Boulder City, Nevada 89005

Exhibit H
Page 1 of 5

LIST OF POWER-RELATED AGREEMENTS
UNDER ADMINISTRATIOU
OF BOTH
UNITED STATES DEPARTMENT OF ENERGY, WESTERN AREA POWER ADMINISTRATION
AND
UNITED STATES DEPARTMENT OF INTERIOR, BUREAU OF RECLAMATION
AS OF OCTOBER 1, 1977

As of October 1, 1977, and until the following contracts are amended to accurately reflect the divided interests of the United States, the "contracting officer" for the following agreements shall refer to:

Manuel Lopez, Jr.
Regional Director
Lower Colorado Region
Bureau of Reclamation
Department of the Interior
P.O. Box 427
Boulder City, Nevada 89005

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Bureau of Mines			
a/ 14-06-300-1215	6/1/61	Boulder Canyon Project	Electric and water service; Operation and maintenance of water supply system from Hoover Dam to retained works.

a/ The United States' interest in this contract has been divided by the formation of the Department of Energy. Therefore, the Department of Energy's Western Area Power Administration is administering those provisions of the contract relating to electric service (essentially Part I of the agreement). The Department of Interior's Bureau of Reclamation will continue to administer the provisions of the contract relating to the operation and maintenance of certain water system facilities and the delivery of water (essentially Part II of the agreement). Because of this joint interest, future modifications of this agreement will require signatures for both the Department of Energy and the Department of Interior on behalf of the United States.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: National Park Service			
b/ 14-06-300-1216	6/1/61	Boulder Canyon Project	Electric and water service; Operation and maintenance of water system.

b/ The United States' interest in this contract has been divided by the formation of the Department of Energy. Therefore, the Department of Energy's Western Area Power Administration is administering those provisions of the contract relating to electric service or electric system facilities (essentially Part I of the agreement). The Department of Interior's Bureau of Reclamation will continue to administer the provisions of the contract relating to the delivery of water and the use, operation, and maintenance of certain water system facilities (essentially Part II). Because of this joint interest, future modifications of this agreement will require signatures for both the Department of Energy and the Department of the Interior on behalf of the United States.

Exhibit H
Page 3 of 5

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Multi-party agreement--see footnote			
c/ 14-06-300-2050	10/15/68	Colorado River Front Work and Levee System/ Parker-Davis/ Gila	Electric service; Construction; Operation and maintenance of electric facilities; Transmission service.

c/ Multi-party agreement among: Arizona Public Service Company; Yuma Irrigation District; and the United States. The United States' interest in this contract has been divided by the formation of the Department of Energy. Therefore, the Department of Energy's Western Area Power Administration is administering those rights of the United States which relate to the electric service contract with the Yuma Irrigation District (essentially Part III of the contract). The Department of the Interior's Bureau of Reclamation will continue to administer those rights and obligations of the United States which relate to irrigation pumping and project use loads. As of October 1, 1977, execution of Amendment No. 1 to Contract No. 14-06-300-2050 was in process by the contract parties. In order to simplify completion of the Amendment and since division of administrative responsibility for the contract was not firmly established at the time of the Amendment's execution, signature on behalf of the United States was required only from the Bureau of Reclamation. However, because of the joint interest of the two departments in the contract, future modification will require signature for both the Department of Energy and the Department of the Interior on behalf of the United States.

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Multi-party agreement--see footnote			
d/ 14-06-300-2438	2/4/74	Navajo Project (Central Arizona Project)/ Pacific Northwest-Pacific Southwest Intertie	Operation, maintenance, and replacement of phase-shifting transformer at Liberty Substation.

d/ Multi-party agreement among: Arizona Public Service Company; City of Los Angeles, Department of Water and Power; Nevada Power Company; Salt River Project Agricultural Improvement and Power District; Tucson Gas and Electric Company; and the United States. The United States' interest in this agreement has been divided by the formation of the Department of Energy. The Department of Energy's Western Area Power Administration (WAPA) is administering the Pacific Northwest-Pacific Southwest Intertie. The Department of Interior's Bureau of Reclamation will continue to administer the United States interest in the Navajo Project. Consequently, WAPA is administering the contract terms relating to operation and maintenance of the phase-shifter and use of the Mead-Liberty line. Reclamation will continue its interest in the contract as a Navajo Participant. Because of this joint interest, future modifications to this agreement will require signatures for both the Department of Energy and the Department of the Interior on behalf of the United States.

Exhibit H
Page 5 of 5

As of October 1, 1977 and until the following contract is amended to accurately reflect the divided interests of the United States, the "contracting officer" for the following agreement shall refer to:

R. A. Olson
Acting Area Manager
Western Area Power Administration
Department of Energy
P.O. Box 200
Boulder City, Nevada 89005

Agreement Identification	Agreement Date	Federal Project Involved	Description of Agreement
Contractor: Arizona Public Service Company			
e/ 7-07-30-P0008	5/2/77	Central Arizona Project	Construction, use, and operation of 230-kV Liberty-Parker and Liberty-Gila Bend transmission line.

e/ The United States' interest in this contract has been divided by the formation of the Department of Energy. Therefore, the Department of Energy's Western Area Power Administration is administering those provisions of the contract which apply to operation and maintenance. The Department of Interior's Bureau of Reclamation will continue to administer the provisions of the contract pertaining to construction. Because of this joint interest, future modifications of this agreement will require signatures for both the Department of Energy and the Department of the Interior on behalf of the United States.

APPENDIX IV - UPPER COLORADO RIVER BASIN COMPACT

1 G.1 - Text of Compact (See Appendix I)

APPENDIX V - COLORADO RIVER STORAGE PROJECT ACT

1 H.1 - Text of Act (See Appendix I)

APPENDIX VI - FILLING CRITERIA

601 - Senate Document No. 7, 88th Congress, 1st Session, March 14, 1963

602 - General Principles and Operating Criteria, approved April 2, 1962

603 - Additional Regulation No. 1, approved July 12, 1962

55-56 601

CRB

88 } SENATE {DOCUMENT No. 7

COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

THE SIXTH ANNUAL REPORT ON THE STATUS OF THE COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

TOGETHER WITH

A STATEMENT OF GENERAL PRINCIPLES TO GOVERN, AND OPERATING CRITERIA FOR, GLEN CANYON RESERVOIR (LAKE POWELL) AND LAKE MEAD DURING THE LAKE POWELL FILLING PERIOD, AND RELATED DOCUMENTS

PRESENTED BY SENATOR ANDERSON

MARCH 14, 1963.—Ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE
95968 WASHINGTON : 1963

CONTENTS

PART I—BASIC DOCUMENTS

1. General principles to govern, and operating criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead during the Lake Powell filling period, approved April 2, 1962 — Page 3
2. Additional regulation No. 1 to the general regulations for generation and sale of power in accordance with the Boulder Canyon Project Adjustment Act — 5
3. Memorandum, Commissioner of Reclamation to Secretary of the Interior, dated December 22, 1961 — 5
4. Memorandum, Commissioner of Reclamation to Secretary of the Interior, dated June 13, 1961 — 10
5. Explanation of proposed procedures for computing deficiencies in firm power generation at Hoover Dam during filling of Colorado River storage project reservoirs — 19
6. Letter, Commissioner of Reclamation to Secretary of the Interior, dated January 18, 1960 — 26

PART II—COMMENTS RECEIVED AND RELATED CORRESPONDENCE

1. Additional regulation No. 1 — 36
   - Memorandum, Commissioner of Reclamation to Secretary of the Interior, dated June 11, 1962 — 36
   - Letter, Commissioner of Reclamation to Chief Engineer, Colorado River Commission of Nevada (identical letters to other Hoover power contractors) dated April 4, 1962 — 37
   - Letter, chairman, Arizona Power Authority, to Commissioner of Reclamation, dated May 1, 1962 — 37
   - Letter, vice president and assistant general manager, California Electric Power Co., to Commissioner of Reclamation, dated May 3, 1962 — 38
   - Letter, chief engineer, Colorado River Commission of Nevada, to Commissioner of Reclamation, dated May 1, 1962 — 39
   - Letter, general manager and chief engineer, the Metropolitan Water District of Southern California, to Commissioner of Reclamation, dated May 8, 1962 — 39
   - Letter, general manager and chief engineer, Department of Water and Power, City of Los Angeles, to Commissioner of Reclamation, dated May 2, 1962 — 40
   - Letter, executive vice president, Southern California Edison Co., to Commissioner of Reclamation, dated May 3, 1962 — 41
2. Comments on June 13, 1961, memorandum from Commissioner of Reclamation to Secretary of the Interior — 42
   - Letter, Senator Clinton P. Anderson to Secretary of the Interior, dated August 25, 1961 — 42
   - Letter, Senator Carl Hayden to Secretary of the Interior, dated August 11, 1961 — 45
   - Letter, Congressman Wayne N. Aspinall to Secretary of the Interior, dated July 14, 1961 — 51
   - California comments, dated October 17, 1961 — 56
   - Letter, chief engineer, Colorado River Commission of Nevada, to Secretary of the Interior, dated January 3, 1962 — 62

3. Comments on handling of evaporation from Colorado storage project reservoirs in computing deficiency in Hoover basic firm energy generation ..... Page 63
Letter, Commissioner of Reclamation to chairman, Engineering Committee, Upper Colorado River Commission (identical letter to chairman, Lower Basin Engineering Group) dated August 26, 1960 63
Letter, chairman, Engineering Committee, Upper Colorado River Commission, to Commissioner of Reclamation, dated January 27, 1961 64
Letter, chairman, Lower Basin Engineering Committee, to Commissioner of Reclamation, dated October 10, 1960 67

STATEMENT BY SENATOR ANDERSON OF NEW MEXICO RELATIVE TO THE 6TH ANNUAL REPORT ON THE STATUS OF THE COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS PURSUANT TO PUBLIC LAW 485 OF THE 84TH CONGRESS (70 STAT. 105)

Mr. President, under date of December 28, 1962, the Assistant Secretary of the Interior, Hon. Kenneth Holum, transmitted to the President of the Senate the sixth annual report of the Department on the status of the Colorado River storage project and participating projects as required by section 6 of the authorizing act of April 11, 1956 (70 Stat. 105).

The report calls attention to three significant events in the development of the project: First, the substantial completion of the Paonia participating project in western Colorado; second, the receipt of the first operating revenues from the sale of water on the Navajo storage unit in New Mexico; and third, the authorization on June 13, 1962, of the Navajo Indian irrigation and San Juan-Chama projects.

Annually this report has been printed as a Senate document and in conformity with this precedent I am sending forward a resolution authorizing that this report be printed.

In addition, Mr. President, the Glen Canyon Dam, which is one of the key units of the project, is nearing completion, and filling of its mighty reservoir, Lake Powell, is about to start. Because of the great importance of this unit to the development of the entire Colorado River system, I am presenting a statement of the criteria and principles governing the filling and operation of the Glen Canyon Dam and Reservoir to be printed as an appendix to the sixth annual report.

Mr. President, I am certain that every Member of the Congress is aware of how vital to the West and to the Nation is the full development of the Colorado River and its resources. As the dean of the Senate, the distinguished Senator from Arizona, Carl Hayden, so picturesquely expresses it: "The Colorado River is the West's last waterhole."

One of the great forward steps the Congress has taken toward maximum development of this cornerstone of so much of the West's, and the Nation's, prosperity was the enactment in 1956 of the Colorado River Storage Project Act, which is Public Law 485, 84th Congress. Among the participating projects authorized by this monumental legislation, which I had the honor to sponsor, was construction of the Glen Canyon Dam and Reservoir.

As construction of Glen Canyon Dam progressed, Secretary of the Interior Stewart Udall initiated studies, in consultation with all of the diverse interests of the Colorado River Basin, to determine how Lake Powell could be filled with the least possible disruption of the many activities now dependent upon the flow of the river. The Secretary was faced with difficult decisions in formulating the filling

criteria finally adopted. These decisions, made, as I have pointed out, only after the most searching study and exhaustive consultation with the varied Colorado River Basin interests, reflect impartial judgment based on expert advice, and are in the best interests of the Colorado Basin as a whole, I am confident.

Fortunately, the favorable runoff of the Colorado River during 1962 will result in almost ideal conditions for the initiation of storage in Lake Powell. With average or near average flows for the next few years the upper basin reservoirs can be filled with a minimum of effect on downstream interests.

The filling of Lake Powell, which will rival Hoover Dam and Lake Mead in size and capacity, together with the other upper basin storage reservoirs, will be another long step forward in unlocking the door to full development of the upper basin's water resources. In this respect the upper basin structures will serve, in effect, the same purposes that Hoover, Parker, and Davis Dams do for the lower basin. Together, these upper and lower basin reservoirs will approach full control of the once-rampaging Colorado River.

In reaching this objective I sincerely hope that Secretary Udall may have the full cooperation of all basin interests and that the remaining development of the Colorado River Basin can proceed at full speed and in harmony and equity.

I am convinced that the printing, as a Senate document, of the Sixth Annual Report on the Status of the Colorado River Storage Project and Participating Projects and the statement of the principles and criteria arrived at by the Secretary and his expert advisers for the filling of Glen Canyon Reservoir will be of value to the Congress and the Nation.

PART I. BASIC DOCUMENTS

GENERAL PRINCIPLES TO GOVERN, AND OPERATING CRITERIA FOR, GLEN CANYON RESERVOIR (LAKE POWELL) AND LAKE MEAD DURING THE LAKE POWELL FILLING PERIOD

1. The following principles and criteria are based on the exercise, consistent with the law of the river, of reasonable discretion by the Secretary of the Interior in the operation of the Federal projects involved. The case generally styled "*Arizona* v. *California, et al, No. 9 Original*" is in litigation before the Supreme Court of the United States. Anything which is provided for herein subject to change consistent with whatever rulings are made by the Supreme Court which might affect the principles and criteria herein set out. They may also be subject to change due to future acts of the Congress.

2. The principles and criteria set forth hereinafter are applicable during the Lake Powell filling period, which is defined as that time interval between the date Lake Powell is first capable of storing water (estimated to occur in the spring of 1963) and the date Lake Powell storage first attains elevation 3,700 (content 28.0 million acre-feet total surface storage) and Lake Mead storage is simultaneously at or above elevation 1,146 (content 17.0 million acre-feet available surface storage), or May 31, 1987, whichever occurs first. If, in the judgment of the Secretary, the contents of Lake Powell and Lake Mead warrant such action, and after consultation with appropriate interests of the Upper Colorado River Basin and the Lower Colorado River Basin, the Secretary may declare that in not less than 1 year from and after the date of such declaration these principles and criteria are no longer applicable.

3. Sufficient water will be passed through or released from either or both Lake Mead and Lake Powell, as circumstances require under the provisions of principles 7 and 8 hereof, to satisfy downstream uses of water (other than for power) below Hoover Dam which uses include the following:

(*a*) Net river losses.

(*b*) Net reservoir losses.

(*c*) Regulatory wastes.

(*d*) The Mexican Treaty obligation limited to a scheduled 1.5 million acre-feet per year.

(*e*) The diversion requirements of mainstream projects in the United States.

4. All uses of water from the main stem of the Colorado River between Glen Canyon Dam and Lake Mead will be met by releases from or water passed through Lake Powell and/or by tributary inflow occurring below Glen Canyon Dam. Diversions of water directly out of Lake Mead will be met in a similar manner or, if application of the criteria of principles 7 and 8 hereof should so require, by water stored in Lake Mead.

5. The United States will make a fair allowance for any deficiency, computed by the method herein set forth, in firm energy generation at Hoover powerplant. For each operating year deficiency in firm energy shall be computed as the difference between firm energy which, assuming an overall efficiency of 83 percent, would have been generated and delivered at transmission voltage at Hoover powerplant in that year if water has not been impounded in the reservoirs of the Colorado River storage project storage units (Glen Canyon, Flaming Gorge, Navajo, and Curecanti), but excluding the effects of evaporation from the surface of such reservoirs, and the energy actually generated and delivered at transmission voltage at Hoover powerplant during that year adjusted to reflect an overall efficiency of 83 percent. At the discretion of the Secretary, allowance will be accomplished by the United States delivering energy, either at Hoover powerplant or at points acceptable to both the Secretary and the affected Hoover power contractors, or monetarily in an amount equal to the incremental cost of generating substitute energy. To the extent the Upper Colorado River Basin fund is utilized the moneys expended therefrom in accomplishing the allowance, either through the delivery of purchased energy or by direct monetary payments, shall be reimbursed to said fund from the separate fund identified in section 5 of the act of December 21, 1928 (45 Stat. 1057), to the extent such reimbursement is consistent with the expenditures Congress may authorize from said separate fund pursuant to said act. The attached additional regulation No. 1 for generation and sale of power in accordance with the Boulder Canyon Project Adjustment Act, upon issuance, will be made a part of these principles and criteria.

6. In accomplishing the foregoing, Lake Powell will be operated in general accordance with the provisions of principles 7 and 8.

7. Storage capacity in Lake Powell to elevation 3,490 (6.5 million acre-feet surface storage) shall be obtained at the earliest practicable time in accordance with the following procedure:

> Until elevation 3,490 is first reached, any water stored in Lake Powell shall be available to maintain rated head on Hoover powerplant. When stored water in Lake Powell has reached elevation 3,490, it will not be subject to release or diminution below elevation 3,490. The obtaining of this storage level in Lake Powell will be in such manner as not to cause Lake Mead to be drawn down below elevation 1,123 (14.5 million acre-feet available surface storage), which corresponds to rated head on the Hoover powerplant. In the process of gaining storage to elevation 3,490, the release from Glen Canyon Dam shall not be less than 1.0 million acre-feet per year and 1,000 cubic feet per second, as long as inflow and storage will permit.

The operation of Lake Powell above elevation 3,490 and Lake Mead will be coordinated and integrated so as to produce the greatest practical amount of power and energy. In view of the provision for allowance set forth in principle 5 hereof, the quantity of water released through each powerplant will be determined by the Secretary in a manner appropriate to meet the filling criteria.

9. In general, it is not anticipated that secondary energy will be generated at Hoover during the filling period. However, any secondary energy, as defined in the Hoover contracts, which may be generated

and delivered at transmission voltage at Hoover powerplant will be disposed of under the terms of such contracts.

10. In the annual application of the flood control regulations to the operation of Lake Mead, recognition shall be given to available capacity in upstream reservoirs.

Approved, April 2, 1962.

STEWART L. UDALL,
Secretary of the Interior.

(Published in Federal Register, 27 F.R. 6851 (July 19, 1962).)

ADDITIONAL REGULATION NO. 1 TO THE GENERAL REGULATIONS FOR GENERATION AND SALE OF POWER IN ACCORDANCE WITH THE BOULDER CANYON PROJECT ADJUSTMENT ACT

In accordance with the terms and conditions of the act of July 19, 1940 (54 Stat. 774), and article 27 of the General Regulations promulgated May 20, 1941, the following additional Regulation No. 1 is hereby promulgated:

"Commencing with June 1, 1987, charges for electrical energy in addition to such other components as may then be authorized or required under the then existing laws and regulations, and to the extent not inconsistent therewith, shall include a component to return to the United States funds adequate to reimburse the Upper Colorado River Basin Fund for moneys expended from such fund on account of allowances for Hoover diminution during the filling period of the storage project reservoirs authorized by the Act of April 11, 1956 (70 Stat. 105), in accordance with paragraph 5 of the General Principles to Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead during the Lake Powell Filling Period, approved April 2, 1962. Such component shall be sufficient, but not more than sufficient, to provide said reimbursement in equal annual installments over a period of years equal to the number of years over which costs on account of allowance were incurred by the said Upper Colorado River Basin Fund."

(Adopted by Secretary of the Interior Stewart L. Udall on July 12, 1962. Published in Federal Register, 27 F.R. 6850 (July 19, 1962).)

U.S. DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington, D.C., December 22, 1961.

MEMORANDUM

To: Secretary of the Interior.
Through: Assistant Secretary Kenneth Holum.
From: Commissioner of Reclamation.
Subject: Principles to govern, and operating criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead during the Lake Powell filling period.

By memorandum of June 13, 1961, I transmitted to you revised general principles and operating criteria recommending that you adopt

them subject to whatever considerations, if any, appeared desirable after having afforded the Hoover power allottees an opportunity to present their views on the additional regulation No. 1 which was made a part of the revised general principles and criteria.

You, in turn, made my memorandum of June 13, 1961, together with its attached revised general principles and criteria, available to lower and upper basin interests for review and comment. We have now received the results of that review and have had extensive discussions thereon with Assistant Secretary Holum. Most of the substantive suggestions for further revision of the general principles had already been thoroughly considered previously by the Bureau, and we find no convincing reasons to make any fundamental changes in the revised general principles and operating criteria submitted to you with my memorandum of June 13, 1961. Several suggestions for changes of minor import were received, however, which appear desirable and are acceptable to us.

The general principles and operating criteria transmitted herewith reflect the Bureau's recommendations taking into account the long history of negotiations, discussions, and views received to date. This memorandum, together with my memorandums of January 18, 1960, and June 13, 1961, and the tabular forms for computing Hoover basic firm and the diminution in power generation under the formula of principle 5 as included in my memorandum of June 13, 1961, comprises a formal record, explanation, and background for these recommendations

We are aware that no set of general principles and operating criteria could possibly fully satisfy all of the diverse interests affected. Before proceeding with a discussion of the most recent comments and suggestions received, therefore, I believe it important to reiterate from my June 13, 1961, memorandum that we have proceeded on the basis—

> * * * of securing a practical approach to the problems of filling, as distinguished from what might be considered a legalistic approach involving an attempt on our part to establish principles and operating criteria on the basis of conclusions as to the perimeters of legal rights and obligations, with the consequent hazards which would attend such an approach. Consequently, our feeling is that irrespective of what might or might not be conceived by any party as the outer measure of its rights or obligations, and with no attempt to establish those limits as a basis for these principles and criteria, we propose action purely within a reasonable exercise of Secretarial discretion.

The most substantive of comments on my June 13, 1961, memorandum go to principle 5, which deals with the proposal to make an allowance for a portion of the diminution in power generation at Hoover Dam, with provision for future reimbursement of moneys expended from the Upper Colorado River Basin Fund utilized in accomplishing such allowance. For purposes of this presentation, however, I will discuss the comments and suggestions received on my June 13, 1961, memorandum in the order of the principle which they concern.

Principle 1.—Question has been raised as to whether acquiescence by a Hoover power allottee in the exercise by the Secretary of "reasonable discretion" in the operation of the Federal projects involved would invoke a legal liability on that power allottee in respect to power which it has contracted to supply from its share of Hoover power. We believe that the contractual relationships between a Hoover power allottee

and its customers are outside the realm of secretarial responsibilities, and hence this question is not pertinent to the general principles and criteria.

Principle 2.—It was suggested that the filling criteria should not end automatically when Lake Powell reaches elevation 3,700 unless at the same time Lake Mead is at or above elevation 1,146. We believe this suggestion has merit, and principle 2 had been revised accordingly.

It was suggested also that the Secretary should give prior notice before terminating the filling criteria previous to the attaining of elevation 3,700 at Lake Powell. Periods of 2 and 5 years were proposed. We agree that in the event of such an action by the Secretary he might well give notice a reasonable time in advance. The measure of reasonableness here, we believe, is the time required by the Hoover power allottees to make such arrangements as might be necessary to accommodate any effects on their operations a change in filling criteria might entail. While this obviously would vary, dependent upon the nature of the revision in filling criteria contemplated, we believe that generally 1 year would suffice. We have thus revised principle 2 to provide a minimum of 1 year's notice. The Secretary could give such notice a longer period in advance if he felt the circumstances so justified.

The point was made that the filling criteria are silent as to operating rules after the filling period. This, of course, is correct. The filling criteria could remain in effect from a minimum of 3 or 4 years up to as many as 24 years. Significant changes in power marketing and in the use of Colorado River water may well occur during the filling period which would influence postfilling operations. Further, the operating experience gained during the filling period is certain to provide valuable bases for developing postfilling operating rules. We believe it premature, therefore, to attempt to prescribe postfilling operating criteria at this time. We do believe, however, that this aspect of future river operation should be constantly kept in mind and that postfilling criteria be formulated as far in advance of the termination of the filling period as possible.

The suggestion was advanced that the filling period and the application of the principles should begin on the date when any one of the Colorado River storage project reservoirs is first capable of storing water. The effect of storage in any of the storage project reservoirs other than Lake Powell on lower river flows would be very nominal. For this reason we prefer that the application of the filling criteria begin on the date when Lake Powell is first capable of storing water.

Principle 3.—It was suggested that the terms "net river losses," "regulatory wastes," and "diversion requirements of mainstream projects" should be defined in terms of legality and limitation. We believe that these terms are commonly understood and, in line with our basic pattern of procedure as previously stated, we would be reluctant to attempt legal definition of these terms.

A suggested clarifying editorial change was adopted as follows: After the word "either" insert the words "or both," and following the words "Lake Mead" substitute the word "and" for the word "or".

Principle 4.—The words "Hoover Dam" were suggested as substitutes for the words "Lake Mead" in the first sentence of principle 4. We believe, however, that the second sentence of principle 4 adequately covers diversions from Lake Mead.

The proposal to insert the words "or losses" after the word "uses" was made presumably to cover evaporation from Lake Mead. We

believe the wording now used adequately covers this matter. (See my memorandum of January 18, 1960.) To insert the words "or losses" would, in our opinion, confuse the issue by introducing the aspect of replacing river losses (as distinguished from reservoir losses) for no apparent reason. We have inserted the word "and/" after the words "Lake Powell" as suggested.

Principle 5.—This principle, dealing as it does with partial allowance for diminution of Hoover energy during the filling period and subsequent partial reimbursement of the Upper Colorado River Basin fund, both contains the heart of the solution to formulation of acceptable filling criteria and invokes the most perplexing problems. The recent comments on this principle cover a wide range of previously held positions varying from that of the upper basin States that they are under no obligation to make allowance for Hoover power deficiencies to that of the lower basin States that allowance for deficiencies in diminution of both energy and capacity at Hoover should be provided without reimbursement. Neither extreme, in our opinion, is practical or serves the purposes sought.

Principle 5 as set forth in the revised general principles and filling criteria recommended in my memorandum of June 13, 1961, represents the selection of a middle-ground solution based on an impartial appraisal of all of the issues involved. In essence, it is a product of judgment as to what constitutes a practical procedure. Such judgment must be made, however, and we sincerely hope accepted, if the related issues are to be kept clear of court actions or other long-drawn-out procedures, which, we believe, would work to the advantage of neither the upper nor lower basin interests nor to the overall development of the water resources of the Colorado River Basin. We still believe that principle 5, as proposed and explained in my June 13, 1961, memorandum, is the most practical approach available.

Other points relating to principle 5 were raised that warrant discussion.

The upper basin interests reiterated their proposal that the Colorado River development fund be used either to make necessary replacement energy purchases or to reimburse the Upper Colorado River Basin fund on a current basis. We believe that this proposal has merit and should be further explored. If there is found to be general support for this among the various basin interests, I would recommend that the Department sponsor such legislation as may be required.

The upper basin interests point out that principle 5 provides a guarantee of energy to the Hoover power allottees but only an intent to reimburse the Upper Colorado River Basin fund. As pointed out in my memorandum of June 13, 1961, this is as far as the Secretary can go at this time without additional legislation.

The lower basin interests suggest that evaporation from storage project reservoirs should be taken into account in determining diminution in Hoover energy. This was discussed in my memorandum of June 13, 1961, and the reasons for our position stated therein have not changed.

It was suggested that Hoover replacement energy should be delivered at times as well as at points acceptable to both the Secretary and the Hoover power allottees. As stated in my memorandum of June 13, 1961, if the allowance is made by delivering energy, it will be delivered in a monthly pattern designed to fit those months when

water otherwise would have been released at Hoover. We believe this accommodates the intent of that suggestion.

Principles 6 and 7.—No adverse comments or suggestions were received relating to these principles.

Principle 8.—It was proposed that any water stored in Lake Powell above elevation 3,490 should be subject to release to maintain rated head at Hoover powerplant. We recognize the desirability of maintaining rated head at both Hoover and Glen Canyon powerplants, and one of the operating rules might well recognize this as far as it is consistent with the broad objectives of the filling criteria. It should not be a part of the filling criteria, however.

Lower basin interests indicate that the offsetting of Hoover impairment should have priority on upper basin power output to the extent that the Secretary cannot find replacement energy for purchase. Although we are willing to devote nonfirm energy to this purpose, as previously indicated, we do not believe the proposal should contemplate use of firm energy. We are confident that arrangements for the purpose of replacement energy combined with the availability of energy produced by upper basin powerplants which cannot be marketed at firm power rates will be adequate to meet the proposed formula.

Principles 9 and 10.—No comments or suggestions were received relating to these principles.

Several other comments and suggestions were received that do not relate to any specific principle.

The point was made that the impact of the storage project operations on the Parker-Davis projects received no attention in the filling criteria. The point was made in relation to a possible power rate increase. The likelihood of the filling operations of Lake Powell causing a need for a power rate increase at Parker-Davis is so remote that we consider it unnecessary to relate the filling criteria to these projects.

The suggestion was again advanced that the upper basin should be formally represented on a river operations committee. It was suggested also that working committees should be formed which would include representation of lower basin water users as well as power contractors who would have an effective voice in secretarial decisions in resolving problems which may arise in filling Lake Powell. In both cases it was indicated that congressional authorization of such committees probably would be necessary or desirable. Responsibility for operation of the Federal projects involved is now vested in the Secretary of the Interior and, we believe, properly should remain so. Creation of new bodies with statutory powers which might tend to limit or diffuse this responsibility would, in our opinion, unnecessarily complicate and make more difficult the coordinated operation of a widespread river basin system. As pointed out in my memorandum of June 13, 1961, we would gladly assist in the formation of a group on an informal basis. In our view, that group could function most appropriately in an advisory capacity to the Secretary.

I recommend that—

1. You adopt the attached general principles and criteria subject to whatever reconsideration, if any, may appear desirable after having afforded the Hoover power allottees an opportunity to present their views on the additional regulation No. 1, in

accordance with article 27 of the General Regulations for Generation and Sale of Power in Accordance with the Boulder Canyon Project Adjustment Act; and

2. You authorize me in your behalf to transmit the additional regulation No. 1 to the Hoover power allottees with a request that their views, if any, be transmitted to me within 30 days; and

3. You authorize me in your behalf to transmit the attached general principles and criteria and the additional regulation No. 1 to the Governors of the basin States, to the Upper Colorado River Commission, to the Senators and Representatives of the basin States, to the Hoover power allottees and to other interested parties; and

4. That in transmitting the general principles and criteria to the Governors of the basin States, I solicit their views on the desirability of legislation to permit use of the Colorado River development fund either to make necessary replacement energy purchases pursuant to principle 5 or to reimburse the Upper Colorado fund on a current basis, with the understanding that, if there is general sentiment in favor of such action, the Department will sponsor or support the required legislation.

FLOYD E. DOMINY.

Attachments.
Recommended by:

KENNETH HOLUM,
Assistant Secretary of the Interior.

April 2, 1962.

STEWART L. UDALL,
Secretary of the Interior.

Approved: April 2, 1962.

U.S. DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington, D.C., June 13, 1961.

To: Secretary of the Interior.
From: Commissioner of Reclamation.
Subject: General principles to govern, and operating criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead during the Lake Powell filling period.

On February 12, 1960, the Department issued proposed general principles and criteria to govern filling of Glen Canyon Reservoir, the principal storage reservoir of the Colorado River storage project. Accompanying the proposed principles was a memorandum of explanation to the Secretary of the Interior from the Commissioner of Reclamation dated January 18, 1960.

In accordance with my recommendations, a series of meetings were held with representatives of the Lower and the Upper Colorado River Basin interests to explain the proposed principles and to receive the reactions thereto. Oral comments and suggestions for modification of the proposed principles were received at meetings held:

In Las Vegas, Nev., March 1960.
In Los Angeles, Calif., May 1960.
In Boulder City, Nev., June 1960.

Written comments from the Upper Colorado River Commission were received by letter dated July 21, 1960, copies of which we under-

stand have been made available to the lower basin interests. In addition, there have been many discussions with interested individuals, correspondence from various Senators and Congressmen, and further meetings as follows:

January 9, 1961, in Salt Lake City, Utah, with the Upper Basin Engineering Committee.

April 20, 1961, in Los Angeles, Calif., with the Hoover power contractors and other lower basin interests.

May 8, 1961, in Denver, Colo., with the Upper Colorado River Commission and advisers.

Out of these meetings, letters, and discussions have come many suggestions for changes in the proposed general principles and criteria. Our own views have also changed on some aspects in light of information developed subsequent to their issuance.

The proposed general principles and criteria have been reviewed by the Bureau taking into account the various comments of the basin interests as well as our own views. The revised general principles and operating criteria transmitted herewith reflect the Bureau's recommendations.

We have proceeded on the basis of securing a practical approach to the problems of filling, as distinguished from what might be considered a legalistic approach involving an attempt on our part to establish principles and operating criteria on the basis of conclusions as to the perimeters of legal rights and obligations, with the consequent hazards which would attend such an approach. Consequently, our feeling is that irrespective of what might or might not be conceived by any party as the outer measure of its rights or obligations, and with no attempt to establish those limits as a basis for these principles and criteria, we propose action purely within a reasonable exercise of secretarial discretion.

In general, the draft of the proposed general principles and criteria was well received and many of the comments involve editorial perfection and clarification rather than change in substance. The most substantive of comments, and the most difficult to reconcile, go to principle 5 which deals with the proposal to make an allowance for a portion of the diminution in power generation at Hoover Dam. Because of the extent of comments on this principle, this memorandum will deal with that principle first.

One of the comments received was that it should be made clear that the general principles and criteria will apply to all of the authorized storage units of the Colorado River storage project and not to the Glen Canyon unit alone. Since the proposed general principles and criteria are framed around the operations of Glen Canyon Reservoir (Lake Powell), it was decided, in the interest of minimizing the extent of revision, to retain the present format. However, principle 5 of the general principles and criteria has been expanded to make it clear that in computing the allowance for deficiency in firm energy generation at Hoover powerplant the formula will take into account the effect on the stream by impoundment of water in all of the storage units (Glen Canyon, Flaming Gorge, Navajo, and Curecanti) but excluding the effects of evaporation from the surface of such reservoirs. Consistent with principle 2, the computation of and provision for allowance would not apply to Navajo and Flaming Gorge until the filling operation starts at Glen Canyon. Lake Powell will probably

start significant filling during the spring runoff of 1963. Flaming Gorge will probably start filling about the same time. Navajo will be about 1 year earlier. Curecanti is not scheduled to start storing water until the fall of 1965.

Suggestions were made that tabular forms illustrating the application of principle 5, along with explanatory sheets and an accompanying statement of criteria for operation of Lake Mead to determine Hoover basic firm power in computing allowance for deficiency, be made a part of the general principles and criteria by attachment. We fully recognize that it is only through having this information available that a precise understanding of the intended application of principle 5 is gained.

Notwithstanding this, however, we are not inclined to incorporate either the tabular forms or the accompanying explanatory material into the general principles and criteria. We believe such action would give undue significance to a matter which must remain open to the exercise of secretarial judgment, particularly as to the use of forms. There is included with this memorandum, however, the tabular forms and explanatory materials which we would intend to use, at least initially, for the purpose of computing the Hoover basic firm and the diminution in power generation under the formula of principle 5.

The forms included herewith are different from those supplied at the Boulder City meeting in June 1960.

One revision made in the material is in the method of handling the efficiency factor. A further review of the tentative forms supplied at the Boulder City meeting showed that in this respect they followed the present billing process rather than the intent of principle 5, which was to be a theoretical computation based on overall efficiency. Our position on use of the 83 percent efficiency factor is, we believe, well set forth in the January 18, 1960, memorandum and need not be repeated here. Suffice it to say that in the original Hoover firm energy computation made for the general regulations, 83 percent efficiency was applied in satisfaction of the formula—acre-feet times head times efficiency times 1.025 equals kilowatt-hours. It was our intent to again apply the 83 percent efficiency factor in this manner. The tentative forms, however, showed a netting out of service station use, leakage and pumpage which is appropriate for the billing process, but not for the theoretical computation. We do not, of course, intend to change the actual billing process. Another revision made is in the method of handling evaporation losses of the storage project reservoirs. For reasons explained hereinafter, such evaporation is not now included as a part of the theoretical streamflow of the Colorado River at Grand Canyon.

Representatives of the upper basin have expressed concern over the contemplated inclusion of evaporation from the storage project reservoirs as a part of theoretical streamflow used in the formula for computing allowance. We have given this matter considerable attention and have concluded that our past studies on handling of evaporation losses have not been consistent with our handling of stream depletions caused by the participating projects. All factors considered and in the interest of consistency, we have concluded that storage project reservoir evaporation should not be considered as part of the theoretical streamflow to be used in calculating diminution in Hoover generation.

Also suggested was the use of an efficiency factor of 78 percent in computing Hoover basic firm energy. From such a computation, there would then be subtracted the energy actually generated at Hoover adjusted to an efficiency factor of 83 percent. The resulting answer would be considered as the deficiency in firm energy. The difference between this proposal and the explanation of our present proposal contained in the January 8, 1960, memorandum is the use of 78-percent efficiency on one side of the formula and 83 percent on the other. Our present proposal uses 83 percent on both sides. There are, of course, several ways in which the combinations of contract firm, basic firm, and actual generation could be arranged. We have tested five combinations ranging from the above suggestion, which tends to minimize the deficiency, to use of the difference between actual generation and contract firm, which tends to maximize the deficiency. Again, in the interest of a practical solution, we do not believe it appropriate to adopt a formula which would result in either extreme. We intend to maintain the proposal as now explained in the January 18, 1960, memorandum; i.e., use of 83 percent on both sides of the formula.

Principle 5 of the draft of general principles and criteria left to the discretion of the Secretary the method of making the allowance for Hoover diminution. The choice was between delivering energy or making monetary payments to the affected Hoover power contractors. It was contemplated that under the choice of delivering energy two courses might be followed:

(1) Delivery of energy generated at Federal powerplants, and
(2) Purchase of energy generated at plants owned by others and delivered to the contractors.

Consequently under either choice there might be a requirement for money. This would be particularly so during the period Lake Powell is filling prior to installation of generators or the obtaining of dead storage in the lake. Although not so stated in the draft principles themselves, the memorandum of January 18, 1960, contemplated, as an operating cost, using moneys from the upper Colorado River Basin fund, established by the Act of April 11, 1956 (70 Stat. 105), to the extent necessary. It is to the use of this fund that the upper basin directs its main criticism.

As we understand it the concern of the upper basin is twofold; first, it feels that use of the upper basin fund for purchase of energy to replace Hoover diminution carries with it a responsibility on the upper basin for energy deficiency at Hoover, a responsibility it categorically disclaims; and secondly, it is concerned that use of the upper basin fund in the manner contemplated might adversely affect availability of power revenues to aid in repayment of the costs of participating projects.

In no way does the Bureau or the Secretary, by proposing to use the upper basin fund for the purchase of energy for Hoover replacement, intend to declare or infer any responsibility on the upper basin for deficiency in energy generation at Hoover. Contemplation of the use of that fund for this purpose is based solely upon, and exercise of, departmental responsibility in operating a project under its jurisdiction.

The second concern of the upper basin goes to a situation which conceivably could develop if water flows less than average are experi-

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enced during the filling period. Assuming a cost of replacement energy of 5 mills per kilowatt-hour, a total of about $1,750,000 would be required to make the allowance under average flow conditions. This is a relatively insignificant amount. Nevertheless, because of the possibility of less than average flows, its concern is understandable and we are therefore making provision in principle 5 for reimbursement to the upper basin fund by the Hoover power allottees for whatever moneys are used from the fund for this purpose.

The word "reimbursed" as used in principle 5 applies only to the moneys expended from the fund. If nonfirm or other energy from the storage project powerplants is used to make the allowance, this is not to be considered a cost to be reimbursed. Notification of the intent to secure reimbursement would be accomplished through an additional regulation for generation and sale of power in accordance with the Boulder Canyon Project Adjustment Act. The additional regulation, as well as being issued formally, is also an attachment to, and a part of, the general principles and criteria.

Consideration was given to including interest in the reimbursement to the upper basin fund. Pursuing this objective would logically call for changes in the method of determining the deficiency for which the allowance is to be made. Taking all factors into account, and in the interst of a practical approach, it is concluded that the reimbursement should consist of a dollar-for-dollar return without interest.

Although the Congress has reserved to itself the right to say how the revenues in the separate fund will be expended within the Colorado River Basin, the responsibility for setting rates, which is the source of revenues in the fund, is in the Secretary. Consequently, the additional regulation is a notification that the rates to charged for electrical energy after 1987 will, among other things, include a component to assure revenues in the fund to accomplish reimbursement. This is as far as the Secretary can go at this time without additional legislation.

Suggestions have been made that the present Colorado River development fund be used either to make necessary replacement energy purchases or to reimburse the upper Basin fund of a current basis. Section 2(d) of the Boulder Canyon Project Adjustment Act provides for the sum of $500,000 annually from Hoover revenues to be available for investigation and construction of projects in the basin. The suggestion then is to use this money for energy replacement purposes rather than for project investigation or construction. To do so would require legislation.

Regardless of what source of funds, if any, may finally be utilized in accomplishing the allowance it is our intent to make minimum use of dollars but maximum use of energy from Federal projects for any required replacement. It is not intended to use firm energy from the storage project powerplants if such energy could otherwise be sold at firm power rates.

If the allowance is made by delivering energy it will be delivered in a monthly pattern designed to fit those months when water otherwise would have been released at Hoover. Stated another way, it is not our intent to force replacement energy on the contractors in those months when downstream releases are generating all, or close to all, of the energy which they might otherwise have expected to receive.

We have also considered a proposal that the Hoover power contracts and regulations might provide a means of securing revenues to pur-

chase replacement energy. Such a proposal would require legislation since it would, among other things, in practical effect involve application of revenues received from Hoover power sales for purposes not consistent with the Boulder Canyon Project Adjustment Act.

By the proposal to make an allowance we are in effect guaranteeing energy to the extent of the deficiency computed by the formula. We have been asked to consider also guaranteeing capacity. It is our understanding that the Hoover power contractors would consider capacity as having been guaranteed if we provided in the criteria that Lake Mead would not be drawn down below elevation 1,146 (17 million-acre-feet available surface storage) at least during the time Lake Powell is filling to dead storage level. It has also been suggested that holding Lake Mead to elevation 1,146, while gaining dead storage in Lake Powell, would provide more of a cushion for downstream water users in the event of a dry year following the year in which Lake Mead may already have been drawn down to 17 million acre-feet. After considering these suggestions, we are, first of the opinion that based upon knowledge of historical operation no undue risk is run when elevation 1,123 (14.5 million acre-feet) is made the minimum draw-down point; second, the important objective of gaining minimum power head at Glen Canyon (elevation 3,490) in the earliest practicable time would be defeated; and third, we have already provided for not drawing Lake Mead below the rated head of the Hoover powerplant. To maintain Lake Mead above elevation 1,123 under all conditions would in effect be guaranteeing overload capacity. Because of these factors no change has been made in principle 7.

Other changes in the present draft are summarized as follows:

To conform with a recent decision, the official name "Lake Powell" has been used in lieu of "Glen Canyon Reservoir."

In principle 1, an insert has been made to indicate that the general principles and criteria might be affected by possible future acts of the Congress.

Principles 2 and 10 have been combined as suggested at the conferences. Old principle 10 has been eliminated, and principle 2 has been expanded. Also, as suggested, provision has been made for the Secretary to consult with both the upper and the lower basin interests before termination of the general principles and criteria for reasons other than attainment of the two specific conditions set forth in principle 2. The Commissioner's memorandum to the Secretary dated January 18, 1960, as well as our oral statements at the three meetings, explained old principle 10 in the light of possible earlier termination of the general principles and criteria due to obtaining sufficient storage to permit cyclical operation. We must also point out that the principle would likewise permit termination under conditions of unsatisfactory filling.

Principle 8 has been shortened by deleting the indented portion. This is in accordance with the suggestions received at the conference. The principle enunciated has not been changed.

Principle 9 has been revised to recognize the possibility that there might be some generation of secondary energy at the Hoover powerplant during the filling period. With the criteria on water releases described in principle 3, it is not likely that there will be any secondary energy generated during the filling period. Nevertheless, should there be incidental secondary energy, it will be disposed of in the same manner as has been the case in the past.

Former principle 11 has now been designated principle 10.

The point made that the upper basin should be represented on a group which will consider the theoretical annual operation of Lake Mead meets with our approval. As the present integration committee is a contractually established body, the upper basin representatives cannot become an official part thereof. We see no reason, however, why an informal group consisting of the present integration committee plus upper basin representatives cannot be formed for the purpose of considering the question of what the theoretical annual operation of Lake Mead would be. We will be glad to assist in forming such a group if it is desired.

In connection with the method of financing the Hoover deficiency as covered in principle 5 as well as all other points contained in the general principles and criteria, we have proceeded within the confines of existing authorities and without regard to the possibilities which are open when we contemplate new legislation. We have already pointed out two proposals for such financing, each of which would require legislation for its implementation. Many others would be available under possible legislation. For example, legislation might provide that in the apportioning of the Upper Colorado River Basin fund in accordance with section 5(e) of the Colorado River Storage Project Act such fund shall be deemed to include any amounts which might have been expended on account of Hoover deficiencies. It is not intended by the provisions included in principle 5 to preclude consideration of the merit of any legislative proposals for dealing with this issue or any other issue raised by the criteria.

I recommend that—

1. You adopt the attached general principles and criteria subject to whatever reconsideration, if any, may appear desirable after having afforded the Hoover power allottees an opportunity to present their views on the additional regulation No. 1, in accordance with article 27 of the general regulations for generation and sale of power in accordance with the Boulder Canyon Project Adjustment Act; and

2. You authorize me in your behalf to transmit the additional regulation No. 1 to the Hoover power allottees with request that their views, if any, be transmitted to me within 30 days; and

3. You authorize me in your behalf to transmit the attached general principles and criteria and the additional regulation No. 1 to the Governors of the basin States, to the Upper Colorado River Commission, to the Senators and Representatives of the basin States, to the Hoover power allottees and to other interested parties.

FLOYD E. DOMINY.

GENERAL PRINCIPLES TO GOVERN, AND OPERATING CRITERIA FOR, GLEN CANYON RESERVOIR (LAKE POWELL) AND LAKE MEAD DURING THE LAKE POWELL FILLING PERIOD

1. The following principles and criteria are based on the exercise, consistent with the law of the river, of reasonable discretion by the Secretary of the Interior in the operation of the Federal projects involved. The case generally styled "*Arizona* v. *California et al., No. 9 Original*" is in litigation before the Supreme Court of the United

States. Anything which is provided for herein is subject to change consistent with whatever rulings are made by the Supreme Court which might affect the principles and criteria herein set out. They may also be subject to change due to future acts of the Congress.

2. The principles and criteria set forth hereinafter are applicable during the Lake Powell filling period, which is defined as that time interval between the date Lake Powell is first capable of storing water (estimated to occur in the fall of 1962 or the spring of 1963) and the date Lake Powell storage first attains elevation 3,700 (content 28 million acre-feet total surface storage), or May 31, 1987, whichever occurs first. If, in the judgment of the Secretary, the contents of Lake Powell and Lake Mead warrant such action, and after consultation with appropriate interests of the Upper Colorado River Basin and the Lower Colorado River Basin, the Secretary may declare these principles and criteria no longer applicable.

3. Sufficient water will be passed through or released from either Lake Mead or Lake Powell, as circumstances require under the provisions of principles 7 and 8 hereof, to satisfy downstream uses of water (other than for power) below Hoover Dam which uses include the following:

(*a*) Net river losses.

(*b*) Net reservoir losses.

(*c*) Regulatory wastes.

(*d*) The Mexican treaty obligation limited to a scheduled 1.5 million acre-feet per year.

(*e*) The diversion requirements of mainstream projects in the United States.

4. All uses of water from the main stem of the Colorado River between Glen Canyon Dam and Lake Mead will be met by releases from or water passed through Lake Powell or by tributary inflow occurring below Glen Canyon Dam. Diversions of water directly out of Lake Mead will be met in a similar manner or, if application of the criteria of principles 7 and 8 hereof should so require, by water stored in Lake Mead.

5. The United States will make a fair allowance for any deficiency, computed by the method herein set forth, in firm energy generation at Hoover powerplant. For each operating year deficiency in firm energy shall be computed as the difference between firm energy which, assuming an overall efficiency of 83 percent, would have been generated and delivered at transmission voltage at Hoover powerplant in that year if water had not been impounded in the reservoirs of the Colorado River storage project storage units (Glen Canyon, Flaming Gorge, Navajo, and Curecanti), but excluding the effects of evaporation from the surface of such reservoirs, and the energy actually generated and delivered at transmission voltage at Hoover powerplant during that year adjusted to reflect an overall efficiency of 83 percent. At the discretion of the Secretary, allowance will be accomplished by the United States delivering energy, either at Hoover powerplant or at points acceptable to both the Secretary and the affected Hoover power contractors, or monetarily in an amount equal to the incremental cost of generating substitute energy. To the extent the Upper Colorado River Basin fund is utilized the moneys expended therefrom in accomplishing the allowance, either through the delivery of purchased energy or by direct monetary pay-

ments, shall be reimbursed to said fund from the separate fund identified in section 5 of the act of December 21, 1928 (45 Stat. 1057), to the extent such reimbursement is consistent with the expenditures Congress may authorize from said separate fund pursuant to said act. The attached additional regulation No. 1 for generation and sale of power in accordance with the Boulder Canyon Project Adjustment Act is hereby made a part of these principles and criteria.

6. In accomplishing the foregoing, Lake Powell will be operated in general accordance with the provisions of principles 7 and 8.

7. Storage capacity in Lake Powell to elevation 3,490 (6.5 million acre-feet surface storage) shall be obtained at the earliest practicable time in accordance with the following procedure:

Until elevation 3,490 is first reached, any water stored in Lake Powell shall be available to maintain rated head on Hoover powerplant. When stored water in Lake Powell has reached elevation 3,490, it will not be subject to release or diminution below elevation 3,490. The obtaining of this storage level in Lake Powell will be in such manner as not to cause Lake Mead to be drawn down below elevation 1,123 (14.5 million acre-feet available surface storage), which corresponds to rated head on the Hoover powerplant. In the process of gaining storage to elevation 3,490, the release from Glen Canyon Dam shall not be less than 1 million acre-feet per year and 1,000 cubic feet per second, as long as inflow and storage will permit.

8. The operation of Lake Powell above elevation 3,490 and Lake Mead will be coordinated and integrated so as to produce the greatest practical amount of power and energy. In view of the provision for allowance set forth in principle 5 hereof, the quantity of water released through each powerplant will be determined by the Secretary in a manner appropriate to meet the filling criteria.

9. In general, it is not anticipated that secondary energy will be generated at Hoover during the filling period. However, any secondary energy, as defined in the Hoover contracts, which may be generated and delivered at transmission voltage at Hoover powerplant will be disposed of under the terms of such contracts.

10. In the annual application of the flood control regulations to the operation of Lake Mead, recognition shall be given to available capacity in upstream reservoirs.

ADDITIONAL REGULATION NO. 1 TO THE GENERAL REGULATIONS FOR GENERATION AND SALE OF POWER IN ACCORDANCE WITH THE BOULDER CANYON PROJECT ADJUSTMENT ACT

In accordance with the terms and conditions of the act of July 19, 1940 (54 Stat. 774), and article 27 of the general regulations promulgated May 20, 1941, the following additional regulation No. 1 is hereby promulgated:

Commencing with June 1, 1987, charges for electrical energy in addition to such other components as may then be authorized or required under the then existing laws and regulations, and to the extent not inconsistent therewith, shall include a component to return to the United States funds adequate to reimburse the Upper

Colorado River Basin fund for moneys expended from such fund on account of allowances for Hoover diminution during the filling period of the storage project reservoirs authorized by the act of April 11, 1956 (70 Stat. 105), in accordance with paragraph 5 of the general principles to govern, and operating criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead during the Lake Powell filling period, approved..... Such component shall be sufficient, but not more than sufficient, to provide said reimbursement in equal annual installments over a period of years equal to the number of years over which costs on account of the allowance were incurred by the said Upper Colorado River Basin fund.

EXPLANATION OF PROPOSED PROCEDURES FOR COMPUTING DEFICIENCIES IN FIRM POWER GENERATION AT HOOVER DAM DURING FILLING OF COLORADO RIVER STORAGE PROJECT RESERVOIRS

In order to implement principle 5 of the "General Principles To Govern, and Operating Criteria For, Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period," it became necessary to develop criteria for operating Lake Mead on a theoretical basis as if the Colorado River storage project reservoirs were not impounding water. Principle 5 of the general principles is quoted as follows:

The United States will make a fair allowance for any deficiency, computed by the method herein set forth, in firm energy generation at Hoover powerplant. For each operating year deficiency in firm energy shall be computed as the difference between firm energy which, assuming an overall efficiency of 83 percent, would have been generated and delivered at transmission voltage at Hoover powerplant in that year if water had not been impounded in the reservoirs of the Colorado River storage project storage units (Glen Canyon, Flaming Gorge, Navajo, and Curecanti), but excluding the effects of evaporation from the surface of such reservoirs, and the energy actually generated and delivered at transmission voltage at Hoover powerplant during that year adjusted to reflect an overall efficeincy of 83 percent. At the discretion of the Secretary, allowance will be accomplished by the U.S. delivering energy, either at Hoover powerplant or at points acceptable to both the Secretary and the affected Hoover power contractors, or monetarily in an amount equal to the incremental cost of generating substitute energy. To the extent the Upper Colorado River Basin fund is utilized, the moneys expended therefrom in accomplishing the allowance, either through the delivery of purchased energy or by direct monetary payments, shall be reimbursed to said fund from the separate fund identified in section 5 of the act of December 21, 1928 (45 Stat. 1057), to the extent such reimbursement is consistent with the expenditures Congress may authorize from said separate fund pursuant to said act. The attached additional "Regulation for Generation and Sale of Power" in accordance with the Boulder Canyon Project Adjustment Act is hereby made a part of these principles and criteria.

In order to develop the criteria for operation of Lake Mead and Hoover Dam, the theoretical study has been divided into two parts: (1) Lake Mead inflow and (2) reservoir operation. These are discussed separately as follows:

LAKE MEAD INFLOW

1. Storage change (including initial accumulation of bank storage) in upstream reservoirs at Lake Powell, Flaming George, Navajo, and the Curecanti system.

2. Recorded flow of the Colorado River at Grand Canyon.

3. The computed theoretical inflow to Lake Mead will be the sum of 1+2. Arrangements would be made to obtain end-of-month contents for the month for each of the upstream filling reservoirs immediately after the end of the month. Records of discharge of the Colorado River at Grand Canyon are available under the present operating methods, so no change would be required to obtain that record.

LAKE MEAD OPERATION

1. The theoretical inflow to Lake Mead would be as computed above.

2. Forecasts of Lake Mead inflow would be made exactly as they are made under present operating criteria, and the release from Hoover Dam to meet predetermined requirements based on (*a*) flood control under regulations being used prior to Glen Canyon; (*b*) irrigation orders and predetermined levels of Lake Mohave; (*c*) energy production schedule as computed from June 1 forecast each year with the firm schedule of generation used if the resulting end-of-December content will stay above 17 million acre-feet. In years of less than firm, as indicated by the theoretical study, that percentage of firm will be generated that will permit the end-of-December content to be 17 million acre-feet or downstream water requirements will be released from Hoover Dam, whichever is the greater. Releases to meet downstream requirements will be made each year regardless of resulting reservoir elevations. The committee on integration and interests of the upper basin will be consulted at the beginning of each operating year, and the proposed theoretical study will be discussed. Actual programs of operation of Hoover Dam will be determined at the regularly scheduled integration committee meetings.

It will be necessary to make some assumptions with respect to distribution of firm energy during a theoretical operation year as actual firm will not usually be attained under the actual operating condition. This distribution of firm energy for the theoretical study will be determined as that which would be produced by the release of water to meet the current estimate of downstream requirements during each of the months of June through September and March through May, and the balance distributed to the months of October through February in a pattern similar to that adopted by the regular integration committee, or a river operation committee if established, for the actual operation of Hoover powerplant during that year of operation.

These computations on a monthly basis will be carried on concurrently with the actual recorded operation of Lake Mead and Hoover Dam to compute the deficiency in Hoover firm energy. Attached is a set of computation forms to be used in the determination of the deficiency in firm energy deliveries at Hoover powerplant. The forms will be kept current each month by the Bureau of Reclamation, and copies will be furnished to all interested parties as soon as possible after the end of each month.

[Sheet 1 of 3, June 1, 1961]

U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION

Computation of deficiency in Hoover firm energy during the filling of Colorado River storage project reservoirs

Computation sheet for actual Hoover powerplant operation adjusted to 83-percent efficiency

Computed by..... Date .....
Checked by..... Date .....

Month	Actual reservoir operations								Adjusted powerplant operations				
	Actual flow of Colorado River at Grand Canyon, 1,000 acre-feet	Actual total net Lake Mead loss, 1,000 acre-feet	Total, Hoover release		Downstream water requirements, 1,000 acre-feet	Lake Mead			Lake Mohave mean monthly elevation, feet	Hoover		Millions of kilowatt-hours	
			1,000 acre-feet	1,000 cubic-feet per second		End of month content, 1,000 acre-feet	End of month elevation, feet	Mean elevation, feet		Average tailwater elevation, feet	Average static head, feet	Total energy at 83-percent efficiency	Firm energy at 83-percent efficiency
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
June													
July													
August													
September													
October													
November													
December													
January													
February													
March													
April													
May													

22 COLORADO RIVER STORAGE PROJECT

EXPLANATION OF SHEET 1 OF 3

Column (2): Actual flow of Colorado River at Grand Canyon. Flow measured and data furnished by Geological Survey.

Column (3): Actual total net Lake Mead loss. This is a water budget computation using the measured flow at Grand Canyon as inflow to Lake Mead, the actual release from Hoover Dam and the actual measured storage change in Lake Mead. It includes unmeasured inflow to the river and lake below the Grand Canyon gaging station, evaporation loss from the lake, changes in bank storage, and diversions from the lake to Nevada.

Columns (4) and (5): Total Hoover release. Water flowing in river below Hoover Dam is recorded in this column.

Column (6): Downstream water requirements. This is the minimum monthly downstream water requirement defined in section 3 of operating principles. This requirement will be estimated by months at the beginning of each year, and adjusted to actual at the end of each month.

Column (7): Lake Mead end-of-month content. Surface storage at end of month (changes in bank storage are reflected in column (3)).

Column (8): Lake Mead end-of-month elevation. Elevation corresponding with end-of-month content shown in column (7).

Column (9): Lake Mead, mean elevation. Computed as average of elevations at end of previous month and end of current month.

Column (10): Lake Mohave, mean monthly elevation. Computed as average of elevations at end of previous month and end of current month. This is used in computation of tailwater elevations for Hoover powerplant.

Column (11): Hoover powerplant—average tailwater elevation. Values to be taken from Hoover powerplant tailwater curves, drawing 45–300–59, and will be based upon Hoover release (col. 5) and Lake Mohave mean monthly elevation (col. 10).

Column (12): Hoover powerplant average static head. Computed as column (9) minus column (11).

Column (13): Total energy at 83 percent efficiency. Values are computed by equation: Kw.-hr. = 1.025 × efficiency (83 percent) × static head (col. 12) × release in acre-feet (col. 4).

Column (14): Firm energy. Same as column (13), but not to exceed scheduled firm energy (col. 14, sheet 3). Show annual total only in the event there is no deficiency indicated on basis of total annual generation.

[Sheet 2 of 3, June 1, 1961]

U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION

Computation of deficiency in Hoover firm energy during the filling of Colorado River storage project reservoirs

Computation sheet for theoretical inflow and loss for Lake Mead

Computed by .....
Date .....
Checked by .....

Month	Units, 1,000 acre-feet												
	Actual reservoir storage content				Reservoir storage change				Actual flow of Colorado River at Grand Canyon (from col. 2, sheet 1)	Theoretical flow of Colorado River at Grand Canyon (sum of cols. 6 through 10)	Computation of theoretical total net loss from Lake Mead		
	Lake Powell	Flaming Gorge	Curecanti units	Navaho	Lake Powell	Flaming Gorge	Curecanti units	Navaho			Actual total net loss (col. 3, sheet 1)	Adjustment of evaporation loss	Theoretical total net loss
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
June													
July													
August													
September													
October													
November													
December													
January													
February													
March													
April													
May													

EXPLANATION OF SHEET 2 OF 3

Columns (2), (3), (4), and (5): Actual reservoir storage content, Lake Powell, Flaming Gorge, Curecanti units, and Navaho. Values for each of these columns are the actual end of month reservoir surface storage content plus an estimate of initial accumulation of bank storage.

Columns (6), (7), (8), and (9): Reservoir storage change—Lake Powell, Flaming Gorge, Curecanti units and Navaho. Values in these columns are derived from figures in columns (2), (3), (4), and (5).

Column (10): Actual flow of Colorado River at Grand Canyon. Flow of Colorado River measured by, and data reported by Geological Survey.

Column (11): Theoretical flow of Colorado River at Grand Canyon. This is computed as the sum of columns (6) through (10). It is the actual flow of the Colorado River at Grand Canyon increased by reservoir storage changes (algebraic) in the Colorado River storage project reservoirs.

Column (12): Computation of theoretical total net loss from Lake Mead, actual total net loss. This is a water budget computation using the measured flow at Grand Canyon as inflow to Lake Mead, the actual release from Hoover Dam and the actual measured storage change in Lake Mead. It includes unmeasured inflow to the river and lake below the Grand Canyon gaging station, evaporation loss from the lake, changes in bank storage, and diversions from the lake to Nevada.

Column (13): Computation of theoretical total net loss from Lake Mead—adjustment of evaporation loss. This is an adjustment to be applied to the actual total net loss (col. 12) and is the difference (theoretical minus actual) between the theoretical evaporation for the theoretical surface area of the lake which corresponds to the elevation shown in column (9) of sheet 3 and the evaporation computed by the Geological Survey for the actual surface area of the lake. The evaporation rate applied to the theoretical surface area of the lake is the same rate applied by the Geological Survey to the actual surface area.

Column (14): Computation of theoretical total net loss from Lake Mead—theoretical total net loss. Column (12) plus (algebraic) column (13).

[Sheet 3 of 3, June 1, 1961]

U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION

Computation of deficiency in Hoover firm energy during the filling of Colorado River storage project reservoirs

Computation sheet for theoretical Hoover powerplant operation assuming no Colorado River storage project and computation of Hoover firm deficiency

Computed by ..... Date .....
Checked by ..... Date .....

Month	Theoretical flow of Colorado River at Grand Canyon, 1,000 acre-feet (from col. 11, sheet 2)	Theoretical total net loss from Lake Mead, 1,000 acre-feet (from col. 14, sheet 2)	Theoretical reservoir operations						Theoretical powerplant operations					Computed Hoover firm deficiency (col. 14, sheet 3, minus col. 14, sheet 1)
			Total Hoover release		Downstream water requirements, 1,000 acre-feet	Lake Mead			Lake Mohave mean monthly elevation, feet	Hoover		Millions of kilowatt-hours		
			1,000 acre-feet	1,000 cubic feet per second		End of month content, 1,000 acre-feet	End of month elevation, feet	Mean elevation, feet		Average tailwater elevation, feet	Average static head, feet	Total energy at 83 percent efficiency	Firm energy at 83 percent efficiency	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
June														
July														
August														
September														
October														
November														
December														
January														
February														
March														
April														
May														

EXPLANATION OF SHEET 3 OF 3

Column (2): Theoretical flow of Colorado River at Grand Canyon. As computed in column (11) on sheet 2.

Column (3): Theoretical total net loss from Lake Mead. As computed in column (14) on sheet 2.

Columns (4) and (5): Total Hoover release. This is the theoretical release required to produce the predetermined firm energy schedule as shown in column (14) and the theoretical releases for flood control, if required.

Column (6): Downstream water requirements. This is the minimum monthly downstream water requirement. (See explanation sheet 1 of 3, col. 6.)

Columns (7), (8), and (9): These columns show the theoretical end-of-month content, corresponding elevation, and mean elevation for Lake Mead resulting from the computation of theoretical inflow and release shown in columns (2) through (5).

Column (10): Lake Mohave—Mean monthly elevation. Computed as average of elevations at end of previous month and end of current month, and is the same figure as shown in column (10), sheet 1 of 3. This same level can be used because Lake Mohave scheduled levels are predetermined and are followed as closely as possible by adjustment of Hoover releases in the case of actual operations, and by adjustment of Davis releases in the case of theoretical operation which is on the basis of a Hoover power operation schedule. It is used in the computation of tailwater elevations for Hoover powerplant.

Column (11): Hoover powerplant, average tailwater elevation. Values are taken from Hoover powerplant tailwater curves, drawing 45-300-59, and are based upon Hoover release, column (5) and Lake Mohave mean monthly elevation, column (10).

Column (12): Hoover powerplant, average static head. Column (9) minus column (11).

Column (13): Total energy at 83 percent of efficiency. Values are computed by the equation: Kilowatt hours = 1.025 × efficiency (83 percent) × static head (col. 12) × release in acre-feet (col. 4).

Column (14): Firm energy. Theoretical predetermined schedule of firm energy is entered in this column. (Included as part of total in col. 13). Show annual total only in the event there is no deficiency indicated on basis of total annual generation.

Column (15): Computed Hoover firm deficiency. This is computed as the Difference between the theoretical Hoover firm energy and the actual Hoover production adjusted to 83 percent efficiency—firm energy (col. 14, sheet 3) minus firm energy at 83 percent efficiency (col. 14, sheet 1).

U.S. DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington, D.C., January 18, 1960.

To: Secretary of the Interior.
From: Commissioner, Bureau of Reclamation.
Subject: Principles to govern, and operating criteria for, filling Glen Canyon, Flaming Gorge, Navajo, and Curecanti Reservoirs.

HISTORICAL

During the stages of formulating the planning report for the Colorado River storage project and participating projects (H. Doc. 364, 83d Cong., 2d sess.), it was recognized that special consideration would need to be given to ways and means of accumulating storage in the reservoirs which were contemplated for authorization and construction. That these were matters for special consideration was pointed out to the committees of the Congress during the extensive hearings leading to authorization of the project. References to the filling period may be found on pages 73, 160, 163, and 164 of House Document 364, 83d Congress, 2d session.

The Congress, by Public Law 485, 84th Congress, 2d session, authorized the Colorado River storage project and participating projects. In so doing, it excluded the Echo Park unit (consisting of Echo Park Dam and Split Mountain Dam) and included the Flaming Gorge, Navajo, and Curecanti units in the initial stage. As a result of this change and because it was felt that administrative people and the Congress were entitled to a reappraisal of the project, the Bureau undertook an economic and financial analysis of the storage project as it had been authorized. This analysis was presented to the Congress and was published as Senate Document 101, 85th Congress, 2d session. In order to make such an analysis, it was necessary that there be assumed certain procedures under which storage would be accumulated in the reservoirs. For this purpose there was prepared what has subsequently become known as the "Hydrologic Bases."

At about this time, there had been indicated widespread interest in the problem of initial filling of the Glen Canyon reservoir. As a result, a meeting was held in Washington, D.C., on October 24, 1957. The Governors or their representatives and other interested persons from the seven states of the basin attended that meeting. At that meeting the statement on "Hydrologic Bases" was presented to the assembled group. That statement was subsequently revised in certain aspects and, as revised, became a part of Senate Document 77, 85th Congress, 2d session. Also at that meeting representatives of Arizona, California, and Nevada offered for consideration the so-called Tri-State Criteria. These criteria, with a slight modification, were published as Senate Document 96, 85th Congress, 2d session.

A second meeting was held on December 4, and 5, 1957, in Las Vegas, Nev. This meeting was also attended by the Governors or, in some cases, their representatives and others from the seven States. At that meeting the Interior Department offered to meet with any of the States singly or jointly upon their request. Subsequent to that meeting there was established a group of engineers representing the States of Arizona, California, Nevada, and the Bureau of Reclamation. This group was to provide additional information of an engineering nature aimed specifically at the filling problem. This engineering group met on the following dates in 1958: February 3 and 4, April 17 and 18; June 25 and 26, September 23 and 24, and December 8 and 9. The group met on March 4 and 5 in 1959, and also met with the upper basin engineers on March 30 and 31 and August 4, 5, and 6, 1959.

During this period the group prepared more than 200 preliminary studies, some by manual process and others by electronic digital computers. These studies were exploratory and, among other things, provided a general framework for the studies subsequently made. An additional 65 operational studies have also been made covering three assumptions of runoff sequence for a 36-year period and 8 general sets of filling criteria. A summary, in report form, of the work of this group was transmitted to you by letter of August 20, 1959, signed by A. J. Shaver for the lower basin engineering group.

By letter of August 27, 1958, the engineering committee of the Upper Colorado River Commission requested that the Department appoint a group of engineers to meet with the committee also for consideration of possible filling criteria. The same Bureau of Reclamation engineers met with the commission's committee. One

meeting on November 6, 1958, was held. The commission's engineering committee subsequently thereto and independently made a large number of operating studies. The summary of its work, in report form, was transmitted to Assistant Secretary Aandahl by letter of September 22, 1959, signed by Ival V. Goslin, chairman, Engineering Committee, Upper Colorado River Commission.

In addition to the foregoing reports, the State of Colorado transmitted a report entitled "Future Operation of Glen Canyon Reservoir, as Related to the Colorado River Compact," which reported upon a study for the Colorado Water Conservation Board by the Colorado Water Investigation Commission. That report is dated July 1959.

WORK OF THE ENGINEERING GROUPS

The studies by both the upper and lower basin engineering groups were prepared on a strictly objective basis, with the purpose of preparing reservoir operation studies in sufficient numbers to permit appraisal of the effect of a wide variety of possible filling conditions. It was not anticipated, at least by the Bureau engineers, that it would be possible to hit on a proposed filling criteria which could be adopted "as is."

For the purposes of this memorandum, it is not believed necessary to brief the results of those many studies. The studies have, nevertheless, been extremely helpful in arriving at the proposed filling criteria which are discussed hereafter. One general observation is that all of the studies show that even a slight change in filling assumptions can create large differences in answers. This dictates that the studies can only be indicative and no one set of detailed regulations can be written in advance to cover all conditions. There must be latitude, therefore, for the Secretary to operate to a great extent on a year-by-year basis.

During the course of the studies and as a result of discussions within the Bureau group and with the upper and lower basin groups certain conclusions became apparent to the Bureau. Neither the upper nor lower basin groups can be expected to agree in all respects with these conclusions. Stated generally, these are as follows:

(1) Nothing should be done at Glen Canyon which would have an adverse effect on the users of water for consumptive purposes below Hoover Dam or use of water from the main stem between Lake Mead and Glen Canyon. The magnitude of these uses will vary from year to year and cannot be accurately forecast on an annual basis.

(2) Secondary energy should not be generated at Hoover Dam except in those times when all reservoirs are full and a spill would otherwise occur.

(3) The obtaining of the minimum power head at Glen Canyon Reservoir, elevation 3,490 (approximately 6½ million acre-feet) at the earliest practicable time should be an objective of any filling criteria.

BUREAU PROPOSAL

Basic to a solution of the filling problem is an answer to what to do about any deficiency that might occur in the firm energy generation at Hoover powerplant incident to filling the storage project reservoirs.

The Bureau of Reclamation, after consideration of all aspects of the

filling problem, has prepared a proposed set of governing principles and operating criteria. This proposal is attached. The proposal is based upon the proposition that an allowance should be made for computed deficiency in firm energy generation at Hoover, which might be caused by Glen Canyon being on the river.

In reading the proposal it is to be noted that it applies specifically to Glen Canyon. It is not necessary that the filling criteria be made applicable to Flaming Gorge and Navajo, also under construction, or to the Curecanti unit to be constructed in the near future. Since the capturing of water in the reservoirs above Glen Canyon is expected to occur concurrently with the filling of Glen Canyon, this would have the effect of increasing slightly the deficiency in Hoover firm power generation. Under the proposal we would be committed to make an allowance, and the capturing of the additional water is a part of the computed deficiency.

DISCUSSION OF PROPOSAL

Paragraph 1 is a recognition that the Supreme Court in the lawsuit *Arizona* v. *California* could well make findings of fact and conclusions of law which could require different principles and criteria from those proposed. In the final analysis, however, the proposed principles have to be based upon reasonable exercise of secretarial discretion. By this process we are not placed in a position of attempting to define the outer limits of either rights or obligations of any of the States or of the United States.

Paragraph 2 defines the filling period. It being intended that these principles would apply only during a filling period, it is necessary to define that period. Because of the possibility of an adverse hydrologic sequence occurring during the gaining of initial storage, it is conceivable that the filling period could extend to a point where upper basin developments might be such as to dictate a different method of reservoir operation. Consequently, it is felt that it would be premature to attempt to state here what might be termed "long-range operating criteria." The filling period, in general, is considered to be the time it takes to fill Glen Canyon (elevation 3,700). It is essential, however, that there be also a cutoff date. The date of May 31, 1987, has been selected because that is the date on which the Hoover power contracts expire.

Paragraph 3 is the statement of principle that during the filling period uses of water, other than power, below Hoover Dam will be satisfied. This is a broad statement of principle and one which is essential. These uses below Hoover, measured as a release at Hoover, can be met in one of, or a combination of, three ways: by passing through the inflow, by storage release at Glen Canyon, or by storage release at Hoover. Exactly how they would be met in any one year will have to be decided in that year and will depend upon the contents of both reservoirs and the Glen Canyon inflow. Consequently, the sources from which these uses will actually be met must be left open. The releases at Hoover Dam to meet these uses have varied in the past and can be expected to vary in the future. The trend of release during the filling period will likely be upward—as more land is brought under irrigation or a greater use is made for domestic and industrial purposes. At the same time uses in the upper basin also will be

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increasing. There is, of course, a relationship between the extent of upper basin uses and the availability of water to the lower basin. The studies performed by the engineering groups assumed releases at Hoover of 7.5 million acre-feet by the upper basin group, as well as assumptions by both groups of 8.5 million acre-feet in 1962, increasing to 9.3 million acre-feet in 1970 and remaining constant thereafter. What releases for these purposes may be in the future are matters of judgment. All aspects considered, it seems to us that they may be expected to range from 8.2 to 8.5 million acre-feet per year during the filling period.

To be noted is the proposal to hold the scheduled delivery under the Mexican Treaty to 1.5 million acre-feet per year. This is the Mexican Treaty obligation. It serves to put the Mexican users on notice that during this period there likely will not be any water whereby the scheduled delivery could reach 1.7 million acre-feet per year which is permissible under the treaty on an "if available" basis.

Paragraph 4 is similar in content to paragraph 3 in that it repeats the principle that uses of water for consumptive purposes will be met but the paragraph applies to the reach of the river between Glen Canyon Dam and Lake Mead and to the use of water directly out of Lake Mead. It is necessary to separate the uses between Glen Canyon and the upper end of Lake Mead from those which are or might be made directly out of Lake Mead, because the former can be served only by two sources, namely, Glen Canyon releases or tributary inflow, while the latter can be served by both of these sources or from water stored in Lake Mead. The uses of water between Lake Mead and Glen Canyon contemplated are the historical uses including pumping from Lake Mead plus an increased annual use of possibly 100,000 acre-feet for consumptive purposes during the filling period, plus evaporation losses from Lake Mead.

Paragraph 5 is the statement of principle that there will be an allowance for computed deficiency in Hoover firm energy which is created by virtue of the operations of Glen Canyon. This paragraph also defines deficiency for purposes of computing the amount of allowance. Determination of deficiency depends upon two calculations. The first calculation would be one to determine the so-called Hoover basic firm which is that firm energy that would have been produced in that year at Hoover without Glen Canyon on the river. The Hoover basic firm would be determined by starting with the actual content of Lake Mead in the year 1962 and running a simulated operation study of Hoover as if Glen Canyon were not on the river and using an overall efficiency factor for power operation of 83 percent. The second calculation would be to adjust the energy actually generated at Hoover (which even without Glen Canyon on the river, actual operating practice shows would probably be produced at an efficiency varying from 70 to 78 percent) to an efficiency factor of 83 percent. The difference between these two answers would, for purposes of the allowance, be considered as the deficiency in firm energy.

At the present time the operations of the powerplant at Hoover are such as to create relatively low efficiency. This is so because the power allottees are to an extent utilizing the Hoover generators for peaking purposes. We do not believe it appropriate to compensate the allottees for that portion of the use of the Hoover plants which represents a type of operation dictated by their own convenience.

The use of the 83-percent efficiency factor would help prevent this type of payment. The 83-percent efficiency factor is selected because that is the efficiency used in the computations to determine the amount of Hoover firm energy as defined in the "General Regulations for Generation and Sale of Power in Accordance With the Boulder Canyon Project Adjustment Act."

The way is left open for the Secretary to determine how the allowance would be accomplished. For example, the Secretary might decide, if it can be worked out, to make a monetary payment therefor. If the incremental cost, which is to say the fuel replacement cost of generating substitute energy, is less than the selling rate for power from the upper basin project, then the upper basin project is better off financially to compensate monetarily than it would be to compensate with kilowatt-hours. On the other hand, it might be simpler and better to compensate with kilowatt-hours. This could be accomplished through the interconnection of the two power systems. It may even be possible that the Hoover power allottees would be willing to have a system of debits and credits on energy. In other words, in those years in which there is a deficiency, the power allottees might be willing to have that deficiency replaced in a subsequent year. Particularly to be noted is the fact that Glen Canyon Reservoir will be available to store water through two flood seasons prior to the availability of the generators at Glen Canyon. If any deficiency is created during this period, it can be compensated only by dollars or by debits and credits, unless some other source of energy is available to the United States. Final decisions on the means of making the allowance is not possible at this time and will need to be based upon negotiations and on results of studies now underway in regard to possible electrical intertie.

In the event of an allowance for computed deficiency, the Hoover power contractors will continue to pay under the Hoover Dam power contracts in the same manner as if the amount of energy involved in the deficiency had been generated at Hoover.

Paragraph 6 is simply a tie between the general principles and the operating criteria.

Paragraph 7 sets forth the method whereby minimum power head (elevation 3,490) would be gained in Glen Canyon. The proposal here is to acquire this storage at the earliest practicable time. However, Lake Mead would not be drawn below the rated head of the Hoover powerplant while acquiring this storage in Glen Canyon. This is a significant point. If the rated head is maintained at Hoover, then only the energy generation at Hoover is affected and not the design capacity.

Paragraph 8 sets forth the principle that the powerplants will be coordinated and integrated and states the general method whereby this will be accomplished. At this time it is not entirely clear whether the coordination and integration need be electrical in addition to hydrologic. Decisions on possible electrical intertie will need to be made later, following additional study. Only very general plans can be set forth in advance. To obtain the greatest practical amount of power and energy, the plants will have to be operated on an annual basis as conditions occur, and there must be therefore freedom to operate without being tied to a specific plan. The proposal for coordinated and integrated operation is deliberately tied to the

provision for allowance. The corollary of a conclusion to provide an allowance for computed deficiency is that the Secretary exercises the discretion to operate in a reasonable manner as he determines.

Paragraph 9: The decision to coordinate and integrate necessarily eliminates secondary energy generation at Hoover. It is conceivable, of course, that if a situation occurs where both reservoirs are completely full and there happens to be an extremely high runoff year, such that water would otherwise spill at Hoover, then secondary energy as defined in the Boulder Canyon project general regulations could be generated.

Paragraph 10 indicates the cutoff date of the filling criteria, and permits earlier cutoff than given in paragraph 2 if such action is warranted. This is desirable because it will likely be possible to obtain full system firm power generation with less than a full Glen Canyon. As soon as this becomes a fact it would be well to close off the filling criteria.

Paragraph 11 is a notification that the flood control regulations at Hoover Dam will be applied in full recognition of the available capacity in the upstream reservoir. The effect of such recognition is to diminish the space which must be held in Lake Mead for the catchment of floods. Such action would, of course, influence cost allocations to be made under section 6 of the act of April 11, 1956.

RESULTS OF THE PROPOSAL

Analyses have been made to appraise the effect of applying these principles and criteria. Any such appraisal can, of course, only be indicative. However, the following results give some indication of the magnitude of deficiencies in Hoover generation which might occur. If it is assumed that a runoff sequence, such as happened in 1930 through 1952 (considered to be an adverse period) should recur starting in 1962, and allowing for increases in upstream depletions, it appears that over that 23-year period the amount of deficiency would be 9,566 million kilowatt-hours, or an average of 415 million kilowatt-hours per year. This is roughly 10 percent of the average Hoover firm energy for the same period. If we assume that runoff conditions such as occurred from 1922 to 1929, inclusive (considered to be a favorable period), occurred in the same sequence, there would be no deficiency in the 8-year period required to fill Glen Canyon Reservoir. If we assume that the sequence starting in 1942 and continuing through 1957 followed by a recurrence of 1922 through 1924 recurred, there would have been a deficiency in 12 of the 19 years, with the total deficiency being about 8 percent of the total Hoover firm.

The period of years which might be involved in filling Glen Canyon under the proposal becomes of lesser significance when the reservoirs are coordinated and integrated for power production, as the objective then is maximum power production and not reservoir filling per se. The study made does show Glen Canyon filling in 23 years under the 1930 sequence, 19 years under the 1942 sequence, and 8 years under the 1922 sequence.

The repayment studies for the upper basin project assume that throughout the period of "Glen Canyon filling" (1) there will be average runoff, and (2) firm generation at Hoover will be maintained to the extent it can be without (*a*) drawing Hoover below 17 million acre-feet, and (*b*) without drawing upon Glen Canyon storage for that

purpose. If assumption (1) is retained but the proposed principles and criteria are substituted for assumption (2) there would be no adverse effect on upper basin payout. To the extent that combined system operation of Hoover and Glen Canyon would increase power production over and above that resulting from the assumptions of the current repayment analysis the upper basin payout would be benefited.

Application of even the adverse runoff cycles of 1930–52 results in storage at Glen Canyon to minimum power head of 6,500,000 acre-feet in from 2 to 3 years. After power generation is initiated at Glen Canyon the objective, as spelled out in the proposed principles and criteria, is to produce the greatest practical amount of power and energy from combined operation. The revenues from all energy generated from the combined system in excess of that required to meet the commitments outlined above for the firm power under the Hoover Dam contracts would be credited to the upper basin project. Thus, it is probable that with allowances for computed deficiency and under integration, and with 1930–52 runoff conditions the rate of upper basin project payout would be somewhat slower for a brief period with the possibility of offsetting gains in later operations.

The Bureau's proposal is an equitable and practicable approach that results in the best use of the natural resource—falling water.

To be recognized is the fact that the proposal states only general priciples and broad operating criteria. It does not attempt to, and should not in our judgment, spell out all of the details which will have to be worked out, many of which would need to be negotiated.

RECOMMENDATION

I recommend that you approve the Bureau's proposal tentatively, and that we carry out the following program:

1. Upon receipt of your approval, copies of the tentative proposal be forwarded to the members of the engineering group, both upper and lower basin, which performed the operating studies. The transmittal would indicate that the proposal is tentative and open for discussion but that it does reflect the principles which the Department presently believes should be adopted. The group would be asked to study the proposal, and after a suitable interval, a meeting would be held with the combined engineering group to discuss and explain the details of the proposal.

2. Following the meeting of the engineers it would be expected that those representing each state would refer the matter to their administrative people and discuss the various considerations involved.

3. After allowing time for discussion and review within the States, a general meeting would be called, preferably in Washington, somewhat similar to the meeting held here in October 1957. At that meeting it would be expected that the States would present their views, both pro and con, following which a final decision would need to be made as to the principles to be followed.

4. Subsequent to the final decision and assuming it is substantially in accord with the present proposal, negotiations on the necessary points would be undertaken immediately.

FLOYD E. DOMINY.

Approved: February 9, 1960.

FRED A. SEATON,
Secretary of the Interior.

PROPOSED GENERAL PRINCIPLES TO GOVERN, AND OPERATING CRITERIA FOR, GLEN CANYON RESERVOIR AND LAKE MEAD DURING THE GLEN CANYON RESERVOIR FILLING PERIOD

1. The following principles and criteria are based on the exercise, consistent with the law of the river, of reasonable discretion by the Secretary in the operation of Federal projects involved. The case generally styled "*Arizona* v. *California, et al., No. 9 Original*" is in litigation before the Supreme Court of the United States. Anything which is provided for herein is subject to change consistent with whatever rulings are made by the Supreme Court which might affect the principles and criteria herein set out.

2. The principles and criteria set forth hereinafter are applicable during the Glen Canyon Reservoir filling period which is defined as that time interval between the date Glen Canyon Reservoir is first capable of storing water (estimated to occur in January 1962) and the date Glen Canyon Reservoir storage first attains elevation 3,700 (content 28 million acre-feet total surface storage), or May 31, 1987, whichever occurs first.

3. Sufficient water will be passed through or released from either Lake Mead or Glen Canyon Reservoir, as circumstances require under the provisions of paragraphs 7 and 8 hereof, to satisfy downstream uses of water (other than for power) below Hoover Dam which uses include the following:

(*a*) Net river losses

(*b*) Net reservoir losses

(*c*) Regulatory wastes

(*d*) The Mexican Treaty obligation limited to a scheduled 1.5 million acre-feet per year

(*e*) The diversion requirements of mainstream projects in the United States

4. All uses of water from the main stem of the Colorado River between Glen Canyon Dam and Lake Mead will be met by releases from or water passed through Glen Canyon Reservoir or by tributary inflow occurring below Glen Canyon Dam. Diversions of water directly out of Lake Mead will be met in a similar manner or, if application of the criteria of paragraphs 7 and 8 hereof should so require, by water stored in Lake Mead.

5. The United States will make an allowance for any deficiency, computed by the method herein set forth, in firm energy generation at Hoover powerplant. For each operating year deficiency in firm energy shall be computed as the difference between firm energy which, assuming an overall efficiency of 83 percent, would have been generated and delivered at transmission voltage at Hoover powerplant in that year if Glen Canyon had not been on the river and the energy actually generated and delivered at transmission voltage at Hoover powerplant during that year adjusted to reflect an overall efficiency of 83 percent. At the discretion of the Secretary, allowance will be accomplished by the United States delivering energy, either at Hoover powerplant or at such other points acceptable to both the Secretary and the affected Hoover power contractors, or monetarily in an amount equal to the incremental cost of generating substitute energy.

6. In accomplishing the foregoing, Glen Canyon Reservoir will be operated in general accordance with the provisions of Sections 7 and 8.

7. Storage capacity in Glen Canyon Reservoir to elevation 3,490 (6.5 million acre-feet surface storage) shall be obtained at the earliest practicable time in accordance with the following procedure:

Until elevation 3,490 is first reached, any water stored in Glen Canyon Reservoir shall be available to maintain rated head on Hoover powerplant. When stored water in Glen Canyon Reservoir has reached elevation 3,490, it will not be subject to release or diminution below elevation 3,490. The obtaining of this storage level in Glen Canyon Reservoir will be in such manner as to not cause Lake Mead to be drawn down below elevation 1,123 (14.5 million acre-feet available surface storage), which corresponds to rated head on the Hoover powerplant. In the process of gaining storage to elevation 3,490, the release from Glen Canyon shall not be less than 1.0 million acre-feet per year and 1,000 cubic feet per second, as long as inflow and storage will permit.

8. The operation of Glen Canyon Reservoir above elevation 3,490 and Lake Mead will be coordinated and integrated so as to produce the greatest practical amount of power and energy. In view of the provision for allowance set forth in section 5 hereof, the quantity of water released through each powerplant will be determined by the Secretary in a manner appropriate to meet the filling criteria. Operation will be generally as follows:

The combined generation at Glen Canyon and Hoover will be at a preestablished annual rate, generally uniform from year to year following an energy build-up period. The obtaining of water in Glen Canyon Reservoir between elevation 3,490 and elevation 3,700 will be accomplished by storing the annual amount by which inflow exceeds release for energy generation at Glen Canyon. To produce the greatest practical amount of power and energy it may be necessary to draw Lake Mead to elevation 1,050. It woud not be practical, however, to draw Lake Mead below elevation 1,050.

9. Because of the coordinated operation, except for energy that would be generated by water which otherwise would be spilled at Hoover Dam, no secondary energy will be generated at Hoover.

10. Whenever Glen Canyon storage has reached elevation 3,700 or May 31, 1987, has occurred, these principles and criteria will no longer be applicable, or if in the judgment of the Secretary the contents of both reservoirs are such as to warrant such action, he may declare these principles and criteria no longer applicable.

11. In the annual application of the flood control regulations to the operation of Lake Mead, recognition shall be given to available capacity in upstream reservoirs.

PART II—COMMENTS RECEIVED AND RELATED CORRESPONDENCE

ADDITIONAL REGULATION NO. 1

By letter of April 4, 1962, the Commissioner of Reclamation requested the comments of the Hoover contractors on additional regulation No. 1. Comments were received from the Arizona Power Authority, California Electric Power Co., Colorado Power Commission of Nevada, city of Los Angeles, Metropolitan Water District of Southern California, and Southern California Edison Co. Comments were not received from the cities of Burbank, Glendale, and Pasadena, Calif.

JUNE 11, 1962.

MEMORANDUM

To: Secretary of the Interior.
Through: Assistant Secretary Kenneth Holum.
From: Commissioner of Reclamation.
Subject: Additional regulation No. 1 to the General Regulations for Generation and Sale of Power in Accordance With the Boulder Canyon Project Adjustment Act.

On April 4, 1962, in your behalf, and as required by article 27 of the "General Regulations for Generation and Sale of Power in Accordance With the Boulder Canyon Project Adjustment Act," I sent copies of the proposed additional regulation No. 1 to the Hoover power contractors. The contractors' comments on the additional regulation No. 1 were requested within 30 days. The 30 days have now expired and we have received comments from six of the nine contractors. The comments received are as follows:

Arizona Power Authority: Declined to comment and urged discussion of the matters it had previously raised in connection with the filling criteria for Lake Powell.

California Electric Power Co.: Expressed its view that additional regulation No. 1 is unfair in forcing the Hoover power contractors to pay for a power loss caused by the filling of Lake Powell. This cost, it contends, should be paid by the Upper Basin States. If, however, the Hoover contractors must stand the cost, the company prefers to see the funds repaid after 1987, but the moneys used should be repaid without interest.

Colorado River Commission of Nevada: Questions the necessity and/or practicability of considering this proposed regulation at this time since it does not become effective until June 1, 1987.

City of Los Angeles: While it assumes that additional regulation No. 1 contemplates reimbursement without interest, it prefers that the regulation state specifically that such reimbursement is to be without interest.

Metropolitan Water District of Southern California: Withheld its comments pending study of alternative proposal to use Colorado River development fund to make allowance for diminution in Hoover basic firm energy during filling period.

Southern California Edison Co.: States that the provisions contained in article 5 of the filling criteria and in the proposed additional regulation No. 1, relative to reimbursement of the Upper Colorado River Basin fund from charges for electrical energy to be made at the Hoover powerplant subsequent to June 1, 1987, would not appear to be authorized by existing law, but rather to be in conflict therewith.

Comments have not been received from the cities of Burbank, Glendale, and Pasadena, the remaining three Hoover power contractors.

Inasmuch as the comments received, copies of which are attached, either do not object to issuance of additional regulation No. 1, or, in my opinion, do not offer substantive reasons opposing its issuance, I recommend that you now formally promulgate additional regulation No. 1 and that it and the filling criteria approved by you on April 2 be published in the Federal Register. Attached for your signature are the documents necessary to accomplish this.

FLOYD E. DOMINY.

U.S. DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington, D.C., April 4, 1962.

CHIEF ENGINEER, COLORADO RIVER COMMISSION OF NEVADA,
Post Office Box 1748, Las Vegas, Nev.

DEAR SIR: On behalf of the Secretary of the Interior and as required by article 27 of the "General Regulations for Generation and Sale of Power in Accordance With the Boulder Canyon Project Adjustment Act," I enclose for your consideration a copy of additional regulation No. 1 to the "General Regulations." Your comments on this additional regulation are requested within 30 days.

Enclosed also is a copy of "General Principles To Govern, and Operating Criteria for Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period," approved by the Secretary on April 2, 1962, of which additional regulation No. 1, upon issuance, will be made a part.

As a third item there is enclosed a set of the tabular forms together with explanatory material, which will be used to compute deficiencies in firm power generation at Hoover Dam during the filling period as provided in principle 5 of the "General Principles."

Sincerely yours,

FLOYD E. DOMINY, *Commissioner.*

ARIZONA POWER AUTHORITY,
Phoenix, Ariz., May 1, 1962.

Mr. FLOYD E. DOMINY,
Commissioner, Bureau of Reclamation,
Washington, D.C.

DEAR SIR: Your letter of April 4, 1962, to the Arizona Power Authority, transmitting copies of "Additional Regulation No. 1 to the General Regulations for Generation and Sale of Power in Accordance With the Boulder Canyon Project Adjustment Act," of "General

Principles To Govern, and Operating Criteria for Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period," and of a set of tabular forms illustrating computations associated with the filling criteria, has been received.

Your letter requests comments on additional regulation No. 1. That regulation is, of course, a byproduct of the filling criteria. Those criteria do not provide sufficient basis for a responsible evaluation of their effect upon Hoover, Davis, and Parker interests. Questions raised in my August 3, 1961, letter to Senator Hayden, a copy of which we understand has been furnished Secretary Udall, remain unanswered.

Consequently, we must decline to comment upon additional regulation No. 1 and continue to urge discussion of the matters raised first in the Bureau's Los Angeles meeting of April 20, 1961, and subsequently in my letter to Senator Hayden.

Sincerely,

ARIZONA POWER AUTHORITY,
C. A. CALHOUN, *Chairman.*

CALIFORNIA ELECTRIC POWER CO.,
San Bernardino, Calif., May 8, 1962.

Hon. FLOYD E. DOMINY,
Commissioner of the Bureau of Reclamation,
Department of the Interior, Washington, D.C.

DEAR MR. DOMINY: We have received your letter of April 4, transmitting copy of "General Principles To Govern, and Operating Criteria for Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period," and additional regulation No. 1 concerning the paying back of electrical energy costs after June 1, 1987, if these costs are incurred while filling Lake Powell. You have asked for our comments on this additional regulation.

We would first desire to say that we feel the additional regulation is unfair to the Hoover contractors by forcing them to pay for a power loss caused by the filling of Lake Powell. This cost should be paid for by the upper basin States, who will receive the benefits from Glen Canyon Dam.

If, however, the Hoover contractors must stand the cost, we prefer to see the funds repaid after 1987, but the moneys used should be repaid without interest.

Even though your letter indicates that "General Principles To Govern, and Operating Criteria for Glen Canyon Reservoir and Lake Mead During the Lake Powell Filling Period" has been approved by the Secretary as of April 2, 1962, we desire to inform you that we still feel that Hoover allottees are being discriminated against by allowing Lake Mead to drop to 14½ million acre-feet during the filling of Lake Powell to its highest elevation, rather than 17 million acre-feet which is surface storage you agree to maintain in Lake Mead after Lake Powell is filled.

This low elevation water content will decrease our kilowatt capacity and could seriously decrease the energy available to each contractor.

Also under these general principles, if an allowance is made by delivering energy to an affected Hoover contractor, we desire that such energy be delivered at times needed, as determined by the contractor.

Very truly yours,

W. T. JOHNSON.

COLORADO RIVER COMMISSION OF NEVADA,
Las Vegas, Nev., May 1, 1962.

FLOYD E. DOMINY,
Commissioner, Bureau of Reclamation,
U.S. Department of the Interior, Washington, D.C.

DEAR MR. DOMINY: With your letter of April 4, 1962, you sent us a copy of regulation No. 1 to the "General Regulations for Generation and Sale of Power in Accordance With the Boulder Canyon Project Adjustment Act." You asked for our comments thereon.

You also enclosed a copy of "General Principles to Govern, and Operating Criteria for Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period."

Comments to the latter, the filling criteria, have been previously submitted to you through correspondence, the last being in our letter of January 2, 1962, addressed to the Honorable Stewart L. Udall, Secretary of the Interior.

Relative to the consideration of additional regulation No. 1 to the "General Regulations," our only comment is in questioning the necessity and/or practicability of the consideration of this proposed regulation at this time since it does not become effective until June 1, 1987. It would seem to us that this is a matter that may well be given further consideration with an understanding and agreement reached thereon some few years from now since 1987 is not in this particular instance a pressing date.

Very truly yours,

A. J. SHAVER,
Chief Engineer.

THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA,
Los Angeles, Calif., May 8, 1962.

FLOYD E. DOMINY,
Commissioner of Reclamation, U.S. Department of the Interior, Bureau of Reclamation, Washington, D.C.

DEAR SIR: Your letter of April 4, 1962, addressed to Governor Brown, suggesting use of the Colorado River development fund for making purchase of energy necessary to satisfy deficiencies of energy at Hoover powerplant resulting from filling of Lake Powell, was referred to the Colorado River Board and is under study.

This district's comments on the proposed additional regulation No. 1 transmitted to this office with your letter of April 4, 1962, are being withheld pending study of your alternate proposal. When a conclusion is reached you will be promptly advised.

However, the district wishes your advice as to the application to the situation confronting the district, of the "General Principles To Govern, and Operating Criteria for Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period," transmitted to this office with your letter of April 4, 1962.

Section 5 of the criteria provides that—

> At the discretion of the Secretary, allowance will be accomplished by the United States delivering energy * * *, or monetarily in an amount equal to the incremental cost of generating substitute energy * * *.

It is apparent that the incremental cost of generating substitute energy applies to allottees having generating facilities of their own capable of producing the substitute energy.

However, this district, having no generating facilities, will be compelled to purchase (rather than generate) substitute energy. The quantity of energy so purchased, and the time of use of such energy, will be dictated by the district's operating requirements. Some such purchases may be "on peak" with reference to the sources of energy, and hence may be more costly than possible "off peak" purchases. The cost of substitute energy to the district presumably will be greater than the contract cost of Hoover energy.

It is the view of this district that in interpreting and applying the quoted language of the criteria, "the incremental cost" to the district of substitute energy will be determined with reference to the actual cost of such energy to the district at the time and in the quantity required for district operations.

Your confirmation (or comments) on this construction, at an early date, will be appreciated. Any difficulty relating to determination of incremental costs would be eliminated if substitute energy can be delivered in accordance with the district's operating requirements. The district will much prefer such substitute energy instead of monetary compensation. Your present assurance that such substitute energy can and will be supplied would be most helpful.

Very truly yours,

R. A. SKINNER,
General Manager and Chief Engineer.

DEPARTMENT OF WATER AND POWER
OF THE CITY OF LOS ANGELES.
Los Angeles, Calif., May 2, 1962.

HON. STEWART L. UDALL,
Secretary of the Interior,
Department of the Interior, Washington, D.C.

Attention of Mr. Floyd E. Dominy, Commissioner of Reclamation.

DEAR SIR: We have your letter of April 4, 1962, transmitting a proposed "Additional Regulation No. 1 to the General Regulations for Generation and Sale of Power in Accordance With the Boulder Canyon Project Adjustment Act" and requesting comments thereon.

We observe that the language with respect to reimbursement to "* * * the Upper Colorado River Basin fund for moneys expended from such fund on account of allowances for Hoover diminution * * *" does not make any provision for interest on the moneys so expended from said fund.

While we should prefer that the language explicitly state that the contemplated reimbursement is to be "without interest," we assume that it is your intent to achieve the same result through the omission of any provision for interest and that the language does in fact achieve this result.

What we have said above with respect to the language of the proposed "Additional Regulation No. 1" is, of course, equally applicable to the language contained in section 5 of "General Principles To Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period"

insofar as that section treats of reimbursement to the Upper Colorado River Basin fund.

If we are at all in error in making these assumptions please advise at once.

Respectfully yours,

SAMUEL B. NELSON,
General Manager and Chief Engineer.

SOUTHERN CALIFORNIA EDISON CO.,
Los Angeles Calif., May 3, 1962.

The Honorable the SECRETARY OF THE INTERIOR,
Washington, D.C.

DEAR MR. SECRETARY: Mr. Floyd E. Dominy, Commissioner of Reclamation, has forwarded to us on your behalf, pursuant to article 27 of the "General Regulations for Generation and Sale of Power in Accordance With the Boulder Canyon Project Adjustment Act," a copy of a proposed additional regulation No. 1 to said general regulations. Mr. Dominy also enclosed a copy of "General Principles To Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period" approved by you on April 2, 1962, of which said additional regulation No. 1, upon issuance, is also to become a part.

Representatives of this company participated in several of the meetings which were held by the Bureau of Reclamation in the course of the preparation of the above-mentioned general principles and we are familiar with them. While we are not in agreement with some of the principles and criteria contained therein, we appreciate that it may not be possible to resolve each question in a manner which will be satisfactory to all interests.

We wish at this time to confine our comments to article 5 of these general principles and to the proposed additional regulation No. 1.

Article 5 of the "General Principles to Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period" makes provision for an allowance in kind or in money in the event of a deficiency in firm energy generation at Hoover powerplant by reason of operations under said criteria. The allowances therein specified, of course, may or may not fulfill the contractual obligations of the United States to the contractors for Hoover power, depending among other things upon the timing and quantity of deliveries of substitute energy and the extent that the payment of incremental cost of energy may compensate for the actual cost of the replacement of capacity and energy, including the cost of the purchase thereof, should such be necessary. The province and effect of such regulation, however, would not appear to be to influence the contractual obligations between the United States and the contractors for Hoover power. Rather, such regulation would appear to be the direction of the Secretary as to the manner in which the physical operations of Lake Mead and Lake Powell should be conducted and the allocation of certain expenditures to the Upper Colorado River Basin fund.

On the other hand, however, the provisions which are contained in article 5 of said general principles and in the proposed additional

regulation No. 1, relative to reimbursement of the Upper Colorado River Basin fund from charges for electrical energy to be made at the Hoover powerplant subsequent to June 1, 1987, would not appear to be authorized by existing law, but rather to be in conflict therewith. Section 5 of the Boulder Canyon Project Act, to which reference is made in said article 5, does not authorize such regulation. This section in part reads as follows:

> After the repayments to the United States of all money advanced with interest charges shall be on such basis and the revenues derived therefrom shall be kept in a separate fund to be expended within the Colorado River Basin as may hereafter be prescribed by the Congress.

The Congress has not taken action up to the present time in this regard excepting in the Boulder Canyon Project Adjustment Act. Section 2 of the Adjustment Act provides in part that all receipts from the project shall be paid into the Colorado River Dam fund and shall be available for the particular matters therein specified, none of which includes reimbursement of the Upper Colorado River Basin fund. In addition, section 7 of the act of April 11, 1956, providing for the Colorado River storage project and participating projects, provides in part that "in the exercise of the authority hereby granted he [the Secretary] shall not affect or interfere with the operation of the provisions of the Colorado River compact, the Upper Colorado River Basin compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, and any contract lawfully entered into under said compacts and acts."

Respectfully submitted.

JAMES F. DAVENPORT.

COMMENTS ON JUNE 13, 1961, MEMORANDUM FROM COMMISSIONER OF RECLAMATION TO THE SECRETARY OF THE INTERIOR

Upon receipt of the June 13, 1961, memorandum the Secretary requested the views and comments of various upper and lower basin interests. The following comments were received:

U.S. SENATE,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Albuquerque, N. Mex., August 25, 1961.

Hon. STEWART L. UDALL,
Secretary of the Interior,
Department of the Interior.

DEAR MR. SECRETARY: Thank you for your letter of June 13, 1961, in which you stated that you have received from Commissioner Dominy a firm recommendation concerning the operation of Glen Canyon Dam during the filling period and in which you enclosed a copy of the Commissioner's memorandum and other pertinent data. I appreciate very much the opportunity to submit my comments with reference to this extremely important question.

I will confine my remarks in this letter to those of a general nature, preferring to leave the engineering and hydrologic technicalities to the upper basin engineering committee and the engineers of New Mexico who have been studying this problem for several years.

The Commissioner's memorandum of June 13 proposes that upper basin energy or money that would otherwise accrue to the upper basin

fund be used to make up deficiencies in basic firm energy generation at Hoover powerplants. It proposes further that any money used from the upper basin fund for this purpose would be reimbursed without interest from Hoover power revenues after 1987. It also plainly states that there would be no compensation for upper basin energy used to meet the deficiencies in Hoover generation. No explanation is given for the reasons behind the proposal to reimburse the dollars advanced and the denial of reimbursement for the energy used.

As far as I have been able to ascertain there is nothing in any of the compacts or congressional acts that constitute the "law of the river" that would direct the Secretary of the Interior, or even authorize him, to take either money or energy derived from a subsequent development on the Colorado River, such as that at Glen Canyon, for the benefit of a prior established facility, such as, Hoover Dam and Reservoir. Also, under the Colorado River Storage Project Act, all of the revenues of the basin fund are allocated to specific purposes, and these purposes do not include paying for deficiencies in generation at Hoover as a part of the operation and maintenance at Glen Canyon. Diminutions in generation at Hoover were contemplated at the time of signing the Hoover power contracts. In fact, those Hoover power contracts are between the Secretary and the Hoover power allottees, and the upper basin as a third party has no responsibility under the contracts.

As you can see, I am very much opposed to the concept expressed in principle 5 of your proposed "general principles" that would require the use of upper basin revenues or energy for the purpose of paying for deficiencies in generation at Hoover Dam that might be caused by the operation of Glen Canyon Dam and other upper basin powerplants.

As a result of inquiries made by my office to your solicitor, I understand that the terms of the Boulder Canyon Project Act and the Boulder Canyon Project Adjustment Act and the general regulations promulgated thereunder are not adequate to provide for meeting the so-called deficiency-in-generation problems that might be created at Hoover Dam. It is therefore apparent that if this problem is to be resolved through the use of existing legislation, amendments to these acts may be necessary in order to give the Secretary authority to meet the situation that exists between himself and the Hoover power allottees with respect to fulfilling the Hoover power contracts. If you can propose remedial legislation I would be very happy to examine it and the possibilities of its enactment by the Congress.

If you, as Secretary, find that it is absolutely necessary, due to conditions beyond your control, that revenues of the upper basin fund or energy generated at upper basin powerplants must be used for the purpose of making up deficiencies in basic firm energy generation at Hoover Dam during the filling period of upper basin reservoirs, I feel that it is mandatory that your proposed filling criteria be modified in certain respects. Several suggestions for modification of your proposed criteria have emanated from technicians representing the upper division States, including New Mexico. I feel that these proposals should be given serious consideration by your office as well as by all interested parties in the Colorado River Basin.

In my estimation some of the more logical and important of these suggestions are:

(1) Principle 5 should provide that the upper basin fund would be reimbursed for the cost of nonfirm or "other energy" used from the upper basin powerplants for the purpose of making up Hoover deficiencies at the dollar value of such energy in the same manner that the fund would be reimbursed for money used to purchase replacement energy.

(2) The language of principle 5 should make clear that the upper basin fund will not be used to guarantee generating capacity, and it should also make clear that any money used for the purchase of replacement energy on an incremental fuel cost basis is to be made at a predetermined rate that will not include a component for plant amortization or for the construction of new generating capacity.

(3) Principle 8 and the explanation thereof should be amended to make it clear that the Secretary is not committed to maintain Lake Mead above elevation 1,123 after Lake Powell reaches elevation 3,490. This is probably what is intended because the Dominy letter states that "the principle enunciated has not been changed."

(4) It has been suggested that the Colorado River development fund should be used for purchasing energy to make up the deficiencies in basic firm energy generation at Hoover Dam during the upper basin reservoir filling period. This procedure would fulfill several objectives. First, it would provide a means whereby the Secretary could fulfill his contracts with the Hoover power allottees without reaching into either the basin fund or energy generated by storage units of the upper basin. Second, it would eliminate the accrual of large interest charges against the upper basin fund that would result if reimbursement to the fund were to be postponed until after 1987, because the Hoover power deficiencies could be paid for on a current or almost current basis.

This proposal is discussed in the memorandum dated April 12, 1961, from Ival Goslin, chief engineer and secretary of the Upper Colorado River Commission, to the Honorable James K. Carr, Under Secretary, Department of the Interior, wherein Mr. Goslin discusses the general principles for fulfilling Upper Colorado River Basin reservoirs. I recommend that this proposal be thoroughly explored by the Department.

It appears to me that the inherent weakness of your presently proposed general principles (June 1, 1961) lies in the fact that you guarantee to the lower basin allottees the fulfilling of their power contracts, but have not provided a guarantee of even partial reimbursement to the upper basin fund. You have expressed an intent in your "additional regulation No. 1" to partially reimburse the upper basin fund after 1987, but have provided no means of implementing this intent. It appears to me that some congressional authority through new or amendatory legislation may be required if your criteria are finally adopted.

After further study of this matter I would be glad to have the opinion of the legal division of your Department with regard to my above suggestions and any other comments that you may have. I will be interested in any suggestions that you may have as to the

means to be used for implementing your proposed reservoir filling criteria.

I regret that I have been delayed in transmitting my comments to you, but circumstances beyond my control have prevented my doing so.

Sincerely yours,

CLINTON P. ANDERSON, *Chairman.*

U.S. SENATE,
COMMITTEE ON APPROPRIATIONS,
August 11, 1961.

The Honorable the SECRETARY OF THE INTERIOR,
Department of the Interior,
Washington, D.C.

DEAR MR. SECRETARY: Referring to my letter of July 18 with regard to the proposed "General Principles To Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period," I have now received comments from the Arizona Power Authority and the Arizona Interstate Stream Commission. A copy of these comments is enclosed for your information.

With regard to them, I believe that the following questions are pertinent:

1. In principle 1 there is a question asked as to the liability of the Arizona Power Authority for inability to deliver contracted power. Does the Department have any comment on this?

2. What would be the situation with regard to operation of Lake Powell after the criteria ceased to be effective, either by declaration of the Secretary or by the termination of the criteria on May 31, 1987? Do you see merit in the proposal that the Secretary announce 5 years in advance if he proposes to declare the criteria of no force?

3. Does the Department contemplate the use of Davis and Parker powerplants to supply energy in lieu of that which is now supplied from Hoover Dam?

4. The Arizona organizations insist that to the extent that lieu kilowatt-hours and kilowatts for purchase are not available, offsetting Hoover impairment shall have first priority on power output at Glen Canyon. Can you give assurance that this will be effected?

5. I would be particularly glad to have your comments on the remarks included on page 5 under the heading "Parker and Davis" wherein the statement is made that the Parker and Davis projects are separate and distinct from the Colorado River storage project.

I will appreciate a careful study of these comments and an indication of the feasibility of a discussion between representatives of the Bureau of Reclamation and of the Arizona Power Authority and the Interstate Stream Commission to work out agreement in those areas where differences exist. I doubt that a public meeting would be of any particular value but I certainly think that a sincere effort should be made to get the Arizona agencies and the Department of the Interior into agreement on mutually acceptable filling and operating criteria.

Yours very sincerely,

CARL HAYDEN,
U.S. Senator.

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ARIZONA POWER AUTHORITY,
Phoenix, Ariz., August 3, 1961.

Hon. CARL HAYDEN,
U.S. Senate, Washington, D.C.

MY DEAR SENATOR HAYDEN: Thank you for your letters of July 13 asking for our comments on Secretary Udall's proposed criteria for operation of Glen Canyon Dam and Lake Powell during the filling period. You asked for those comments by July 25, but by telephone we were assured by Mr. Elston that August 7 was an acceptable alternative date.

To give you a complete documented response to the criteria would require a report, not a letter. Moreover, Arizona, Nevada, and California have a common interest in those criteria, and we anticipate that the three States will jointly study the criteria, determine areas of agreement and disagreement, and, as has been the purpose to date, work with the Bureau of Reclamation toward criteria representing reasonable compromise and fairness on the part of all interests. This letter is intended, however, to show you that Arizona cannot afford to acquiesce in the criteria in their current form.

Our comments, discussing the separate principles of the criteria in order, are attached. Most of these comments were made by representatives of Hoover allottees during the April 20, 1961, meeting in Los Angeles called by the Bureau of Reclamation. Adequate answers were not provided in most instances. The material furnished you and which you sent on to us leaves many problems unsolved. In our judgment, Secretary Udall's proposals require much discussion, clarification, general tightening, and documentation before the Hoover allottees come to acquiescence in a final product.

Arizona, and we think California and Nevada, are very disappointed in the lack of Bureau progress in the solving of this complex problem, and over a possible intent to promulgate these criteria without the Bureau's providing the answers sought in the April 20, 1961, meeting. Nevertheless, Arizona and the other Hoover allottees would be willing, we are sure, to work intensively and objectively with the Bureau to avoid the alternative to a negotiated solution: In all sincerity, we urge that negotiation.

The impact of Colorado River storage project operations upon Parker and Davis powerplant operations receives no attention in Secretary Udall's proposals. These plants are important elements in Arizona's economy. Arizona accepts as inevitable a diminution in their output as a result of storage project filling operations. Unless relief is provided, rates must increase. Arizona holds that Parker and Davis are just as distinct from the storage project as though they were under a separate agency of Government, or private enterprises, and that the Secretary of the Interior has not the discretion to subordinate their payout (at the expense of their customers) to the uncertain rights of another project. Accordingly, we have continually urged the Bureau to recognize the Parker-Davis problem, and will continue to do so.

Your recognizing our interest in these matters is appreciated. We assure you, again, of our willingness to work constructively with the Bureau in the development of fair solutions to its problems.

Yours very truly,

C. A. CALHOUN, *Chairman.*

COMMENTS ON GENERAL PRINCIPLES TO GOVERN, AND OPERATING CRITERIA FOR, GLEN CANYON RESERVOIR (LAKE POWELL) AND LAKE MEAD DURING THE LAKE POWELL FILLING PERIOD, JUNE 13, 1961

ARIZONA POWER AUTHORITY AND, ARIZONA INTERSTATE STREAM COMMISSION

Principle 1

The "reasonable discretion" of this principle must be read along with Commissioner Dominy's foregoing of a "legalistic approach" as set out in the sixth paragraph of his communication of June 13, 1961, to the Secretary of the Interior. Arizona, and other Hoover allottees, have always been ready to compromise reasonably toward a practical means of getting Glen Canyon into fruitful operation, but the Arizona Power Authority has, in total effect, contracted away to others the total of Arizona's share of Hoover generation. Can the authority acquiesce in the impairment of that share without becoming liable, legally, to its contractors? "Legalistics" cannot be dismissed lightly.

Principle 2

This principle is suggestive of two implications. The first is the date of May 31, 1987. Quite obviously, this is the date on which the Hoover allottees cease to be able to lean upon their Hoover contracts for defense against adverse operations by the Secretary upstream. Arizona, California, and Nevada may reasonably have interests in Hoover beyond the expiration of current contracts, and subordination of Hoover toward easing possible repayment problems in the upper basin would be prejudicial toward those interests. As you know, there is interest in establishing a lower basin account, with Hoover as the most substantial element; the Bureau of Reclamation and Arizona have exhibited the most interest. Subordination of Hoover would affect a lower basin account adversely. Finally, Congress has an interest in Hoover repayment extending beyond 1987, in that there remain for repayment substantial items of costs, such as unliquidated Boulder City municipal costs, unliquidated costs ascribed to equipment installed after 1937 on a 50-year payout basis, and the flood control allocation of $25 million (unless Congress acts to wipe out that obligation). Subordination of Hoover after 1987 would result in slower payout of Hoover than indicated to Congress at the time of authorization. Accordingly, neither Arizona nor the Congress can acquiesce in criteria still, after several years, silent as to operating rules holding after the "filling" period, or after 1987.

The second disturbing implication of this principle is that the Secretary may declare these criteria no longer applicable at any time at his discretion, after consultation with upper and lower basin interests. Note that only consultation, not agreement, is requisite to a substitution of criteria presently unknown. Arizona cannot afford to acquiesce, uninformed as to the ensuing criteria. If the Secretary were to offer a 5-year notice prior to his changing operating rules, this element of the criteria would be much more palatable.

Principle 3

No comment.

Principle 4

No comment.

Principle 5

This principle would appear to have the United States make the present generation of Hoover contractors "whole" during the "filling" period as to power and energy which would have been generated at Hoover in the absence of impoundments at Glen Canyon, Flaming Gorge, Navajo, and Curecanti Dams. There are details, however, which bear inspection.

The effects of evaporation at these reservoirs is not to be included in the "allowance" made by the United States for impairment of Hoover production. In actual fact, Glen Canyon, Flaming Gorge, and Curecanti are, and will be for many years, purely power projects performing no irrigation or other consumptive use function. Use of water incident to power production has, as you know, the lowest of priorities, and the rights of one basin against the other for water for such use are obscure. This principle would give the upper basin the superior right to such use of water. Arizona considers this an area of possible compromise, but cannot acquiesce in this element of this principle as written.

Allowance for Hoover impairment might be accomplished by the Secretary delivering lieu power and energy at Hoover Power Plant or other mutually acceptable points. The sources of that lieu power and energy are not clearly stated. Ostensibly, the sources are Glen Canyon, Flaming Gorge, and Curecanti in the upper basin. These cannot furnish lieu power and energy while collecting dead storage and simultaneously impairing Hoover generation. Commissioner Dominy uses the terms "Federal powerplants," and "Federal projects." There has been disturbing speculation that the Bureau of Reclamation contemplates the use of Davis and Parker Power Plants to supply lieu energy, and the reluctance of the Bureau to renew Parker-Davis contracts has given weight to this speculation. Such operation would, so far as meeting Arizona's power needs are considered, amount to a substantial diminution of Arizona's power supply. This speculation should be resolved by the Bureau, and must be before Arizona could consider acquiescence.

The Secretary could provide lieu energy by purchase from others. Apparently sufficient kilowatt-hours are available for purchase within Arizona. Such purchase implies legal authority and appropriations available to the Secretary, and the criteria nowhere provide assurance that these are or will be available to him.

Present indications are that lieu kilowatt capacity will not be available for purchase by the Secretary or Arizona should Hoover capacity be impaired. This matter will be discussed further in connection with principle 7.

Under this principle, the Secretary might make direct monetary payments to the separate allottees, in amounts "equal to the incremental cost of generating substitute energy." Arizona assumes that "incremental cost" is used here in the sense that if Hoover energy might have cost Arizona 3.5 mills per kilowatt-hour delivered, and if Arizona paid 5.0 mills for lieu energy delivered, the Secretary would pay Arizona 1.5 mills toward that cost, and relieve Arizona of a commensurate share of Hoover charges. If this is not the meaning intended, the Bureau should make its intent clear. Again, there is no

showing that the Secretary will have the authority and appropriations out of which to make such payments.

Commissioner Dominy states "* * * it is our intent to make minimum use of dollars but maximum use of energy from Federal projects for any required replacements." The Bureau should define "Federal projects" to assure those concerned that Davis and Parker are not included in this statement. He goes on to say: "It is not intended to use firm energy from the storage project powerplants if such energy could be sold at firm power rates." "Firm" is, as you know, a matter of definition. At a meeting in Los Angeles on April 20, 1961, Bureau representatives were asked to give the definition of "firm" applicable here. The answer was: "Any power and energy which can be fitted under the customer's load curve." Pressed, those representatives agreed that power and energy are generated and sold only if it can be fitted under the composite load curve of the customers. They then went on to state that fuel replacement power and energy would be firm in that sense, and specifically referred to the interest of a Colorado-Nebraska-Wyoming group in just such energy. Under such reasoning, any power and energy which could be marketed at any price would be sold rather than assigned to offsetting Hoover impairment.

It may be that the newly added term "firm power rates" may provide the saving grace here. If the Secretary were to substitute for "firm power rates" the expression "6.5 mills at delivery points on the trunk transmission system" the intent would be made clear.

This principle 5 would, in ultimate effect, apparently relieve present Hoover allottees of adverse effects from the "filling" of storage project reservoirs, with the cost of such relief to be borne by succeeding generations of Hoover contractors, and at the expense of extending the Hoover payout period. Arizona fully expects to be one of the future contractors, so the relief held out is for an interim period at best. And there is no assurance that the Secretary is in fact authorized to offer even this interim relief by prolongation of the Hoover payout period.

Principle 6

No comment.

Principle 7

The language of this principle provides that Hoover kilowatt capacity will not be impaired while Glen Canyon is developing dead storage. This Arizona believes most important, for while kilowatt-hours are apparently available in lieu of Hoover generation, lieu kilowatt capacity will in all probability not be available from other Arizona generating sources.

Principle 8

Principle 8 would apparently permit Lake Mead to fall below Hoover rated head level once Glen Canyon has developed dead storage. Two things happen if Lake Mead falls below that level. Kilowatt capacity of the powerplant becomes impaired, and maintenance and replacement costs, particularly of the hydraulic turbines, rise sharply.

Glen Canyon, Flaming Gorge, and Curecanti could provide the lieu kilowatts not available for purchase in Arizona, but Commissioner

Dominy's communication to the Secretary makes it plain that the offsetting of Hoover impairment in kilowatt-hours and kilowatts has a second priority, at best, on Glen Canyon, Flaming Gorge, and Curecanti output. Arizona will be heard to insist that the offsetting of Hoover impairment must have first priority on that output to the extent that the Secretary cannot find lieu kilowatt-hours and kilowatts for purchase.

Arizona will seek assurance of relief from extraordinary maintenance and replacement costs arising out of the Secretary's operating Hoover at less than rated head through exercise of his discretion.

The coordination and integration of Lake Powell above elevation 3,490 and Lake Mead above rated head level (which we believe to be the intent) toward production of the greatest practical amount of power and energy is a worthy purpose which Arizona can endorse. Such coordination and integration implies inevitably the subordination of one or the other of the powerplants from time to time in the interest of achieving that maximum. This principle should be extended to provide for the free flow of credits and debits between the two plants so that both would assuredly share in the benefits of such coordination and integration.

Principle 9

No comment.

Principle 10

No comment.

Parker and Davis

The impact of storage project operations upon Parker and Davis receives no attention in Secretary Udall's proposals. Arizona accepts as inevitable a diminution in their output as a result of storage project filling operations. Unless relief is provided, rates must increase. Arizona holds that Parker and Davis are just as distinct from the storage project as though they were under another agency of Government, or private enterprises, and that the Secretary of the Interior has not the discretion to subordinate their payout (at the expense of their customers) to the uncertain rights of another project. Accordingly, we have continually urged the Bureau to recognize the Parker-Davis problem, and will continue to do so.

Your recognizing our interest in these matters is appreciated. We assure you, again, of our willingness to work constructively with the Bureau in the development of fair solutions to its problems.

ARIZONA INTERSTATE STREAM COMMISSION,
Phoenix, Ariz., August 3, 1961.

Hon. CARL HAYDEN,
U.S. Senate, Washington, D.C.

MY DEAR SENATOR HAYDEN: Under date of July 13, you requested our comments on a memorandum from the Commissioner of Reclamation to the Secretary of the Interior dated June 13, 1961, on the subject of "General Principles To Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake

Powell Filling Period." The comments of the Arizona Power Authority were similarly requested and the staff of the authority has afforded us an opportunity to read a draft of its proposed comments.

Ever since receipt of your letter, key members of our staff have been and, contrary to our expectations, still are, engaged in the final stages of the preparation of Arizona's answering brief in *Arizona* v. *California, et al.*, and could not be detached to review the referenced materials. Accordingly, although our interest in the subject continues unabated and notwithstanding that we shall continue to participate in negotiations and conferences regarding them, we are unable at this time to comment in detail on these filling criteria.

The stream commission is vitally interested in the physical, legal, and economic availability of Colorado River water for utilization in Arizona and the impact thereon of policies to govern the filling and operation of the Glen Canyon Reservoir. It is, of course, essential that criteria, either filling or operating, shall accord with the law of the river, a subject upon which the criteria under discussion are notably silent. It is essential also that they shall have regard for the future development of the basin's last water resource.

As negotiations looking to the development of criteria to govern releases from the Glen Canyon Reservoir have progressed, they have veered away from long-range considerations. The criteria under discussion are concentrated upon problems of hydroelectric power and of compensation for loss of hydropower production during the filling period.

We are deeply concerned over this fact and believe that every effort should be made to return to the objective of long-range operation criteria.

Sincerely yours,

WAYNE M. AKIN, *Chairman.*

CONGRESS OF THE UNITED STATES,
HOUSE OF REPRESENTATIVES,
Washington, D.C., July 14, 1961.

Hon. STEWART L. UDALL,
Secretary of the Interior,
Washington, D.C.

DEAR STEWART: I am transmitting herewith, as you requested, my reaction to the proposed filling criteria for the Glen Canyon Reservoir.

The criticism is intended to be entirely constructive, and I want you to know that I do understand the difficulty in which you and the Bureau of Reclamation are placed in this particular matter.

Whatever your final decisions are, I shall do my very best to be helpful and to see that the program is carried out without unnecessary delay and hindrance.

Again, my appreciation to you.

Sincerely,

WAYNE N. ASPINALL.

HOUSE OF REPRESENTATIVES,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
OFFICE OF THE CHAIRMAN,
Washington, D.C., July 13, 1961.

Hon. STEWART L. UDALL,
Secretary of the Interior,
Department of the Interior, Washington, D.C.

DEAR MR. SECRETARY: This letter is in reply to yours of June 13, 1961, requesting my views with reference to a recommendation that you have received from Mr. Floyd E. Dominy, Commissioner of Reclamation, concerning the operation of Glen Canyon Dam and Reservoir during the initial filling period.

I appreciate your courtesy in permitting me to review the proposed criteria. While I am highly critical of some portions of the proposed criteria, I fully appreciate the complexities of the problem that the forthcoming operation of the Glen Canyon Reservoir poses for your Department. I shall therefore attempt to analyze the criteria in terms of constructive criticism. As Commissioner Dominy stated in his letter of June 13, 1961, the fundamental objections of the upper basin States are to the proposed principle No. 5. This principle requires the United States, through the Department of the Interior, to reimburse Hoover Dam power contractors for so-called power "deficiencies" in Hoover generation at the expense of the Upper Colorado River Basin fund. This point was comprehensively discussed in memorandums of March 20 and April 12, 1961, by Mr. Ival V. Goslin to Under Secretary James K. Carr.

The fundamental guidelines to be followed in this case are contained in the Colorado River compact of 1922. There is nothing in that compact nor in any subsequent compact or act of Congress that places a power delivery servitude on the upper basin in favor of lower basin power contractors.

At a hearing held in Washington, D.C., on April 8, 1941, with Secretary Ickes presiding, Mr. James H. Howard, general counsel, Metropolitan Water District of Southern California and chairman of Conference of Power Contractors, spoke at some length regarding the relation of kilowatt-hours of firm energy to the amortization period, extracted as follows:

"* * * No one asked the United States to 'guarantee' the presence of water in the required amount [to produce defined firm energy]. *That would be obviously absurd.*" [Italic supplied.]

"* * * To agree to pay for the works * * * regardless of the amount of energy actually delivered was not considered good business, particularly in view of the fact *that upstream diversions*, which might contribute to the reduction in firm energy, were not within the control of the power contractors." [Italic supplied.]

I am therefore in disagreement with the premise that the United States is under any obligation to supply a fixed amount of energy to Hoover Dam at the expense of the upper basin fund. Such presumption, as above noted, was correctly described by the power contractors as "obviously absurd" at the very inception of their contractual relationships with the United States.

As you know, I am one of the authors of the Colorado River Storage Project Act. The purposes of the act and the allocations of revenues accruing to the basin fund therein established are fully self-explana-

tory. It comes as a shock to me that there is now a proposal to divert either revenues or energy for purposes completely alien to the expressed intention of the act. I cannot believe that such authority is vested in your office in view of the fact that the exercise of discretion must be predicated upon a legal proposition, and the Supreme Court has said that an administrative official must have the bounds and limits of his actions established.

The proposed criteria attempt to provide some reimbursement to the upper basin fund. The suggested return, however, is relatively minor and does not recognize that the diversion of energy from the upper basin powerplants, whether firm or nonfirm, has exactly the same effect as the diversion of dollars from the basin fund. Neither does the suggested reimbursement to the basin fund recognize that the diversion of either upper basin revenues or energy creates a further substantial drain on the fund due to the added interest charges caused by the postponement of the return to the U.S. Treasury of the capital investment in interest-bearing allocations.

The proposed filling criteria provide a guarantee of energy to the Hoover power contractors but do not guarantee even partial reimbursement to the upper basin fund for the costs of making up Hoover power diminutions. I am assuming that you have consulted your Solicitor and have been advised by him that the Secretary under the terms of the Boulder Canyon Project Act or Boulder Canyon Project Adjustment Act does not have the authority to adjust Hoover power rates or defer beyond 1987 the amortization of Hoover Dam costs for the purpose of meeting the Hoover firm power contract deficiencies that might be caused by the Colorado River storage project; and, further, that Congress has reserved unto itself the right to say how Hoover power revenues shall be used after 1987 making it impossible for the Secretary to do anything more about a guarantee to the upper basin at this time than to declare his intent in the "additional regulation No. 1" appended to the proposed criteria. If this assumption is correct, it is clearly evident that in order to implement the criteria, i.e., to carry out the intent to reimburse the upper basin fund, congressional legislation will be necessary.

Mr. Dominy mentioned in his letter to you that suggestions have been made that the Colorado River development fund be used to pay for Hoover power diminutions during the reservoir filling period. The use of this fund was also discussed in the Goslin memo of April 12, 1961, to Under Secretary Carr. This proposal should be given serious consideration. The CRD fund was originally created by the Boulder Canyon Project Adjustment Act, section 2(d). It results from the transfer of $500,000 annually of Hoover power revenues to a special fund in the Treasury authorized to be appropriated by the Congress for project investigations and construction. For the years of operation ending in 1956 to 1987, inclusive, the CRD fund is earmarked for the investigation and construction of projects in and equitably distributed among the States of the upper division and the States of the lower division. Under present procedure it is necessary to request the Congress to appropriate money accrued in the CRD fund before that money can be used. If agreement among the seven basin States can be reached to change the use of the CRD fund and congressional authority therefor obtained, the following would be accomplished:

(a) Authorization for the Secretary to look elsewhere (to Hoover revenues) rather than to the upper basin for a source of

revenues or energy with which to fulfill his Hoover power contracts;

(*b*) Elimination of the concept of principle No. 5 of the proposed criteria to which the upper basin objects; and

(*c*) Payment for the Hoover generating diminutions on a current (or almost current) basis, time preventing the accrual of increased interest charges against Glen Canyon.

It has been suggested that the $500,000 per year from the CRD fund might be used by the Secretary either to directly make the necessary replacement energy purchases or to reimburse the upper basin fund for money diverted for making up Hoover generation diminutions. Since the Bureau proposes disregarding the return of the interest cost to the upper basin fund when funds are diverted therefrom, it would be better to allow the Secretary to stay completely away from the upper basin fund in paying for Hoover power diminutions and use the CRD fund for direct purchase of replacement energy. In this manner the added interest burden to the upper basin fund would be eliminated.

Disregarding for the moment the interest charges on the balances remaining annually of the cost of replacement energy and assuming the costs of nonfirm replacement energy and dollar charges that the Bureau of Reclamation used in its Financial and Power Rate Analysis, September 1960 (same as referred to in the Dominy letter) the CRD fund could be applied as follows:

Year	Nonfirm energy cost	Other energy purchases	Total dollars needed	From Colorado River development fund	Balance
1963		$875,000	$875,000	$500,000	$375,000
1964	$50,000	875,000	923,000	500,000	800,000
1965	2,052,000		2,052,000	500,000	2,352,000
1966	1,247,000		1,247,000	500,000	3,099,000
1967	565,000		565,000	500,000	3,164,000
1968				500,000	2,664,000
1969				500,000	2,164,000
1970				500,000	1,664,000
1971				500,000	1,164,000
1972				500,000	664,000
1973				500,000	164,000
1974				164,000	0

I realize, of course, that to change the use of the Colorado River development fund would require congressional amendatory legislation, and that other changes in the Boulder Canyon Project Adjustment Act may be necessary.

In shortening principle No. 8, the indented portion has been omitted, one part of which would have allowed Lake Mead to be drawn to elevation 1,050 after Glen Canyon Reservoir attains elevation 3,490, if necessary, in order to produce the greatest practical amount of power and energy. It is assumed that under the new principle No. 8 this procedure would still be followed because the Dominy letter states, "the principle enunciated has not been changed."

Commissioner Dominy in his letter states that the Bureau of Reclamation approves the idea that the upper basin be represented on a group which will consider the theoretical annual operation of Lake Mead. Representation of the upper basin on such a group is

fine, but in view of the upper basin's interest in the overall operation of the entire Colorado River, the idea does not go far enough. First, the upper basin is interested far beyond the theoretical annual operation of Lake Mead which is largely determined by the application of the filling criteria anyhow. Second, as Mr. Dominy points out, the integration committee for Hoover Dam operations is a contractual body, and representatives of the upper basin are precluded from participation thereon. An informal group consisting of the Hoover integration committee plus upper basin representatives would leave the upper basin without formal, effective status. The upper basin as well as the lower basin is entitled to formal contractual membership on a river operations committee. Amendatory legislation probably would be necessary to accomplish this objective.

Other items about the proposed criteria to which I wish to call your attention are:

(*a*) Mention has been made that the low operating efficiency at Hoover Dam should be corrected or that water released from Hoover should be on the basis of an efficiency of 83 percent as originally planned when the contracts were made. However, if the Hoover power diminutions are paid from some other source than upper basin energy and/or revenues, or if reimbursement is guaranteed to the upper basin fund, the matter of efficiency at Hoover becomes relatively unimportant insofar as the upper basin is concerned as long as downstream releases of water are controlled.

(*b*) The use of 5 mills for replacement energy has been subject to some question. It is suggested that, if possible, the Bureau of Reclamation should make a firm predetermination of the rate to be paid for replacement energy and explain what it would include.

(*c*) In principle No. 3 the terms "net river losses," "regulatory wastes," and "diversion requirements of mainstream projects" should be defined in terms of legality and limitation. For instances, deliveries of water for these purposes should not include uses for which there are not contracts or water rights, or that are unreasonable, or unaccounted for.

In general, I would say that the Bureau of Reclamation has done as well as can be expected under the circumstances with the current draft of criteria. The fact remains, however, that the criteria provide a guarantee to the lower basin and only an intent to partially reimburse the upper basin, which on the basis of the various compacts, disclaims any responsibility for deficiencies that may occur in power contracts between the Secretary and third parties. It appears that the Bureau has produced a set of criteria within the framework of which there might be involved a choice of important concepts; i.e., payment for Hoover power diminutions without resort to use of the upper basin fund or reimbursement to the upper basin fund if it is used. The fundamental weakness lies in the fact that the means of implementing either of these choices is lacking because they would require amendatory legislation by the Congress.

Under average streamflow conditions it appears that the criteria might be used by the Secretary as an interim means of planning and initiating the filling of upper basin reservoirs, but should not be regarded as final. Due to the need for legislation to implement certain

important parts of the criteria discussed above it is suggested that you seek agreement among the seven Colorado River Basin States on legislation to make operable and effective the use of the CRD fund or other funds to purchase Hoover replacement energy, or to provide a means of guaranteeing reimbursement to the upper basin fund of moneys diverted therefrom for uses other than the allocations made in the authorizing act which did not contemplate the purchase of energy for Hoover replacement as an operating and maintenance charge at Glen Canyon.

It is recognized by everybody concerned that the real objective now before us is to put the generating facilities at the upper basin reservoirs on the line as rapidly as possible in order to assure the financial feasibility of the Colorado River storage project, conserve water, and make possible the full development of the resources of the Colorado River Basin.

Again, thank you for the opportunity to comment on this important question. If I can be of further assistance in obtaining the necessary legislation to effectuate the filling criteria or in any other capacity please let me know.

Sincerely yours,

WAYNE N. ASPINALL, *Chairman.*

OCTOBER 17, 1961.

CALIFORNIA COMMENTS RE JUNE 13, 1961, PROPOSAL OF COMMISSIONER OF RECLAMATION FOR COLORADO RIVER STORAGE PROJECT FILLING PRINCIPLES AND CRITERIA

(Submitted by Senators Engle and Kuchel)

The following comments are submitted on behalf of the State of California and the California agencies with rights and interests in the use of water and power from the Colorado River with respect to the proposal by the Commissioner of Reclamation entitled "General Principles To Govern, and Operating Criteria for. Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period" submitted to the Secretary of the Interior by the Commissioner on June 13, 1961, with accompanying memorandum.

The proposal of June 13, 1961, a revision of a draft proposal issued on February 12, 1960, does not provide adequate safeguards and contains certain inequities. For example, it does not give proper recognition to the potential loss of kilowatt capacity at Hoover powerplant. The Hoover power allottees in California have insisted from the beginning of the consideration of the problems involved in the filling of Lake Powell and other upper basin reservoirs, that the protection of generating capacity at Hoover Dam in kilowatts is as essential as the continued delivery of the amounts of electric energy in kilowatt-hours.

Attention is invited to the provision in section 7 of the Colorado River Storage Project Act (Public Law 485; 70 Stat. 105):

The hydroelectric powerplants and transmission lines authorized by this Act to be constructed, operated, and maintained by the Secretary shall be operated in conjunction with other Federal powerplants, present and potential, so as to produce the greatest practicable amount of power and energy that can be sold at

firm power and energy rates, but in the exercise of the authority hereby granted he shall not affect or interfere with the operation of the provisions of the Colorado River compact, the Upper Colorado River Basin compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, and any contract lawfully entered unto under said compacts and Acts.

Recommended herewith are certain revisions considered essential to the proper recognition of the rights and interests of the water and power users of California. Attached hereto is a copy of the Commissioner's proposal of June 13 upon which the revisions urged by the California interests are indicated by striking through the recommended deletions and underlining the recommended additions. The recommended revisions are discussed in the paragraphs which follow, in the order in which they occur.

The title and the first sentence of section 2 are changed to make the proposed principles and criteria apply on an equal basis to all the authorized reservoirs in the Colorado River storage project, not to Lake Powell alone. So far as the effect on the lower basin is concerned there is no distinction between water withheld to fill the Flaming Gorge Reservoir, for example, and water withheld to fill Lake Powell. It appears only reasonable, equitable, and consistent that the filling period and the application of the principles should begin on the date when any one of the Colorado River storage project reservoirs, is first capable of storing water. Such intent is indicated in the eighth paragraph of the Commissioner's memorandum of June 13 and in section 5 of the proposed principles and criteria, but section 2 appears to be inconsistent with section 5.

The second revision is in the middle of section 2 to provide that the application of the principles and criteria shall not end automatically when Lake Powell first attains elevation 3,700, unless at the same time Lake Mead storage is at or above elevation 1,146. It is deemed essential that during and after the filling of Lake Powell to elevation 3,700, a reasonable cushion against adverse runoff conditions be provided by stroage in Lake Mead, in order to assure the full meeting of downstream water requirements and the maintenance of rated head at Hoover powerplant. In addition, it appears that the transition from filling to cyclical operations would be more readily and smoothly achieved if the contents of Lake Mead were at a fairly high level at the start.

The next revision in the last sentence of section 2 is to provide that the Secretary shall not at any time previous to the attaining of elevation 3,700 for the water surface in Lake Powell, declare for any other reason that the principles and criteria are no longer applicable, except upon notice to the affected parties a reasonable period in advance. This is so that the lower basin power and water users may have ample time to appraise the situation which would result from cancellation of the criteria, and opportunity to take such action as appears necessary.

Revisions suggested in sections 3 and 4 of the proposed principles and criteria appear to require no special comment or explanation.

The next revision, in line 9 of section 5, reverses the Commissioner's proposal and states that the effects of evaporation from the surface of the upper basin reservoirs shall be included in computing the total effects of the filling of such reservoirs upon the power capacity and energy generation of the lower basin powerplants. The position of lower basin interests upon this item is set forth in a letter dated October 10, 1960, from A. J. Shaver, chief engineer of the Colorado River

Commission of Nevada, on behalf of the lower basin engineering group to the Commissioner of Reclamation. Evaporation from the Colorado River storage project reservoirs is not related to consumptive uses of water in the upper basin until such time as the holdover storage is actually needed for compliance with article III(d) of the Colorado River compact. Reservoir operation studies indicate and spokesmen for the Reclamation Bureau have stated in the record that such time is far in the future. Presumably, it will not occur until after the upper basin reservoirs are filled for the first time. During the filling period there should be no distinction between water that is withheld and remains in the Colorado River storage project reservoirs and water that evaporates from those reservoirs, so far as the effects upon the lower basin are concerned.

The next revision, in the third sentence of section 5, inserting the words "and at times" after "at points", is made for obvious reasons. In that connection it is recommended that the second full paragraph on page 6 of the Commissioner's memorandum, beginning with "If the allowance is made", be changed to read as follows:

> If the allowance is made by delivering energy it is not our intent to force replacement energy on the contractors in those months when downstream releases are generating all or close to all of the energy which they might otherwise have expected to receive. Delivery of the replacement energy will be made in accordance with the same schedule, or at other times acceptable to the contractor, by which each contractor would otherwise have used water for the generation of its allotment of Hoover energy were that water not withheld for filling upper basin reservoirs. By the same token when allowance is made for diminution of energy generation at Hoover powerplant by monetary payment to the contractors, such payments will cover the cost to each contractor of generating replacement the energy under the same schedules and at the same times that the contractor would otherwise have used Hoover water for the generation of that energy. In other words, the monetary payment to each contractor would equal that contractor's replacement cost of generating the energy that would otherwise have been available to the contractor were that water not withheld for filling upper basin reservoirs.

The next revision occurs also in the third sentence of section 5, in the last phrase. The purpose is to provide that monetary compensation to the Hoover power contractors shall cover the cost of securing a substitute supply of capacity a well as a substitute supply of energy. The effects of the filling of the Colorado River storage project reservoirs may impair the capacity of the machines available to the Hoover power contractors as well as the quantities of energy available. This capacity has a real value to the Hoover contractors. They should not be penalized by having to supply substitute capacity at their own expense if the necessity for such substitute capacity is a result of the filling of the Colorado River storage project reservoirs. The compensation for lost energy should cover the full cost of replacement, including related capacity.

According to a recent statement by the Commissioner the primary purpose of the installation of generating unit N–8 in Hoover powerplant, scheduled for completion November 30, 1961, is to permit greater peaking capacity at the plant. The additional generator will not increase the annual energy output. It seems illogical to thus increase the peaking capacity at great expense but at the same time to propose reservoir filling principles that would for the most part

ignore in connection with monetary reinbursement the great value of such peaking capacity to the Hoover power contractors.

The last portion of section 5, concerning reimbursement of the upper basin fund after 1987, is stricken through in the attached revision of the Commissioner's proposal of general principles and criteria. The Hoover power contractors in California are opposed to such a provision as they consider that it would be an unfair penalty against lower basin power users in the future.

It is a well-established principle that if the output of existing powerplants is to be impaired by new developments upstream, the financial burden of such impairment rests on the upstream development. To whatever extent Lake Mead storage may be drawn upon to meet downstream requirements, the storage project will benefit by faster filling of the reservoirs and buildup of power head than could otherwise occur.

Section 8 of the proposed principles is revised to include a provision that any water stored in Lake Powell above minimum power pool shall be subject to release to maintain rated head on Hoover powerplant. It is considered imperative that insofar as practicable the kilowatt capacity at the Hoover powerplant be unimpaired by reason of the filling of the storage project reservoirs.

Suggested revisions in the proposed principles and criteria not specifically mentioned or discussed herein are considered self-explanatory.

In addition to the change recommended above, other corollary changes should be made in the Commissioner's memorandum of June 13, 1961, to the Secretary in accordance with the revisions of the actual principles and criteria.

No statement of general principles and criteria can possibly cover all contingencies. It is realized that many of the details of the actual operation of the reservoirs during the period of filling of the Colorado River storage project reservoirs must be left to the discretion of the Secretary of the Interior and his advisers. Additional criteria and more specific operating rules no doubt will be formulated and applied as the procedure evolves. To this end it is recommended and strongly urged that the Secretary in conjunction with the announcement of proposed principles and criteria also provide definite and specific arrangements for the formation of a working committee to collaborate with the Secretary in resolving the problems that are bound to arise and in devising and enforcing specific operating rules to insure that the daily, monthly, and yearly operation of the reservoirs will lead to full observance of the general principles and correct application of the fundamental criteria. Such a committee should include representation of the lower basin water users as well as the power contractors, and the water users and power contractors should be given an effective voice in the decisions to be reached by the Secretary in consultation with the committee. Congressional authorization for constitution of such a committee is desirable. An adequate gaging program to obtain the required information on streamflow, storage, and use would be fundamental to the deliberations of such a committee.

GENERAL PRINCIPLES TO GOVERN *FILLING OF COLORADO RIVER STORAGE PROJECT RESERVOIRS*, AND OPERATING CRITERIA FOR, GLEN CANYON RESERVOIR (LAKE POWELL) AND LAKE MEAD DURING THE [LAKE POWELL] FILLING PERIOD

(Additions in italic; deletions in black brackets)

1. The following principles and criteria are based on the exercise, consistent with the Law of the River, of reasonable discretion by the Secretary of the Interior in the operation of the Federal projects involved. The case generally styled "Arizona v. California, et al., No. 9 Original" is in litigation before the Supreme Court of the United States. Anything which is provided for herein is subject to change consistent with whatever rulings are made by the Supreme Court which might affect the principles and criteria herein set out. They may also be subject to change due to future Acts of the Congress.

2. The principles [and criteria] set forth hereinafter are applicable during the *time interval between the date any of the Colorado River Storage Project Reservoirs (Lake Powell and Flaming Gorge, Navajo and Curecanti Reservoirs)* [Lake Powell filling period, which is defined as that time interval between the date Lake Powell] is first capable of storing water [(estimated to occur in the fall of 1962 or the spring of 1963)] and the date Lake Powell storage first attains elevation 3,700 (content 28.0 MAF total surface storage) *and Lake Mead storage is simultaneously at or above elevation 1146 (content 17.0 MAF available surface storage)*, or May 31, 1987, whichever occurs first. If, in the judgment of the Secretary, the contents of Lake Powell and Lake Mead warrant *or will warrant* such action, and after consultation with appropriate interests of the Upper Colorado River Basin and the Lower Colorado River Basin, the Secretary may declare *that in not less than 2 years from and after the date of such declaration* these principles and criteria *are* no longer applicable.

3. Sufficient water will be passed through or released from either *or both* Lake Mead *and* [or] Lake Powell, as circumstances require under the provisions of principles 7 and 8 hereof, to satisfy downstream uses of water (other than for power) below Hoover Dam which uses include the following:

a. Net river losses.
b. Net reservoir losses.
c. Regulatory wastes.
d. The Mexican Treaty obligation limited to a scheduled 1.5 million acre-feet per year.
e. The diversion requirements of mainstream projects in the United States.

4. All uses *or losses* of water from the main stem of the Colorado River between Glen Canyon Dam and *Hoover Dam* [Lake Mead] will be met by releases from or water passed through Lake Powell *and*/or by tributary inflow occurring below Glen Canyon Dam. Diversions of water directly out of Lake Mead will be met in a similar manner or, if application of the criteria of Principles 7 and 8 hereof should so require, by water stored in Lake Mead.

5. The United States will make a fair allowance for any deficiency, computed by the method herein set forth, in firm energy generation at Hoover Power Plant. For each operating year deficiency in firm energy shall be computed as the difference between firm energy which,

assuming an over-all efficiency of 83 percent, would have been generated and delivered at transmission voltage at Hoover Power Plant in that year if water had not been impounded in the reservoirs of the Colorado River Storage Project storage units (Glen Canyon, Flaming Gorge, Navajo and Curecanti), [but excluding] *including* the effects of evaporation from the surface of such reservoirs, and the energy actually generated and delivered at transmission voltage at Hoover Power Plant during that year adjusted to reflect an over-all efficiency of 83 percent. At the discretion of the Secretary, allowance will be accomplished by the United States delivering energy, either at Hoover Power Plant or at points *and at times* acceptable to both the Secretary and the affected Hoover power contractors, or monetarily in an amount equal to the *replacement* incremental cost of *securing a* substitute *supply of capacity and* energy. [To the extent the Upper Colorado River Basin Fund is utilized the moneys expended therefrom in accomplishing the allowance, either through the delivery of purchased energy or by direct monetary payments, shall be reimbursed to said Fund from the Separate Fund identified in Sec. 5 of the Act of December 21, 1928 (45 Stat. 1057), to the extent such reimbursement is consistent with the expenditures Congress may authorize from said Separate Fund pursuant to said Act. The attached Additional Regulation No. 1 for Generation and Sale of Power in accordance with the Boulder Canyon Project Adjustment Act is hereby made a part of these principles and criteria.]

6. In accomplishing the foregoing, Lake Powell will be operated in general accordance with the provisions of Principles 7 and 8.

7. Storage capacity in Lake Powell to elevation 3,490 (6.5 million acre-feet surface storage) shall be obtained at the earliest practicable time in accordance with the following procedure:

Until elevation 3,490 is first reached, any water stored in Lake Powell shall be available to maintain rated head on Hoover Power Plant. When stored water in Lake Powell has reached elevation 3,490, it will not be subject to release or diminution below elevation 3,490. The obtaining of this storage level in Lake Powell will be in such manner as not to cause Lake Mead to be drawn down below elevation 1,123 (14.5 million acre-feet available surface storage), which corresponds to rated head on the Hoover Power Plant. In the process of gaining storage to elevation 3,490, the release from Glen Canyon Dam shall not be less than 1.0 million acre-feet per year and 1,000 cubic feet per second, as long as inflow and storage will permit.

8. The operation of Lake Powell above elevation 3,490 and Lake Mead will be coordinated and integrated so as to produce the greatest practical amount of power and energy. *Any water stored in Lake Powell above elevation 3,490 shall be subject to release to maintain rated head on Hoover Power Plant.* In view of the provision for allowance set forth in Principle 5 hereof, the quantity of water released through each power plant will be determined by the Secretary in a manner appropriate to meet the filling criteria.

9. In general, it is not anticipated that secondary energy will be generated at Hoover during the filling period. However, any secondary energy, as defined in the Hoover contracts, which may be generated and delivered at transmission voltage at Hoover Power Plant will be disposed of under the terms of such contracts.

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10. In the annual application of the flood control regulations to the operation of Lake Mead, recognition shall be given to available capacity in upstream reservoirs.

COLORADO RIVER COMMISSION OF NEVADA,
Las Vegas, Nev., January 3, 1962.

HON. STEWART L. UDALL,
Secretary of the Interior, Washington, D.C.

MY DEAR MR. SECRETARY: We have at hand a copy of the June 1961 "General Principles To Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period." It is our understanding that the Secretary of the Interior will be interested in comments thereon from the interested parties.

The Colorado River Commission of Nevada, a party to the lower basin engineering group, which has made studies and previously offered comments on the proposed "filling criteria," offers these further comments, commenting only upon those paragraphs which, in our opinion, are subject to revisions:

Section 2: As presently written these criteria apply only to the Lake Powell filling. We suggest that these principles apply during the period defined as the interval when any Colorado River storage project reservoir is capable of storing water and the date on which Lake Powell storage attains an elevation of 3,700 feet, with Lake Mead elevation simultaneously at or above 1,146 feet, or May 31, 1987, whichever occurs first. We believe it was the intent of the Commissioner of Reclamation to apply these principles at the date of the capability of any of the Colorado River storage project reservoirs to store water as indicated in his comments of June 13, and as appear in section 5 of the criteria. Sections 2 and 5 are inconsistent in this respect.

Section 5: The position of the lower basin group, on the item of "evaporation" is set forth in a letter from A. J. Shaver, on behalf of the lower basin engineering group, dated October 10, 1960. We believe that evaporation during the filling period is part and parcel of the total reduction of flow to the lower basin.

Further in section 5, provision is made for the Secretary to make fair allowance for any deficiency in firm energy in Hoover powerplant, either in replacement energy or monetarily. In either event, this replacement should be in accordance with the Hoover contractor's schedule, and at times and in amounts that would have been available to the contractor had water not been withheld in the Colorado River storage project reservoirs.

Nevada must insist also in the recognition of capacity rights in Hoover powerplant, and to storage in Lake Mead to protect those rights. Generating unit N–8, assigned to the State of Nevada, is now producing capacity and energy for the State, The Commissioner recognizes that the installation of this unit, at a rating of 95,000 kilowatts, permits greater peaking capacity, but does not increase the total annual energy delivery to the State. We cannot logically accept criteria that do not consider the value of this peaking capacity unless reimbursement is made in capacity deficiencies as well as in energy deficiencies.

We cannot agree with the theory of reimbursement to the upper basin fund after 1987, at the expense of the Hoover power contractors, as we consider this a penalty imposed against the future power use of the Hoover contractors.

Section 8: We feel that this provision should provide for releases from Colorado River storage project reservoirs to provide for the maintenance of rated head on Hoover powerplant (storage in Lake Mead), so that the capacity of the Hoover units is unimpaired.

May we ask your earnest consideration of these comments and suggestions.

Very truly yours,

A. J. SHAVER, *Chief Engineer.*

COMMENTS ON HANDLING OF EVAPORATION FROM COLORADO RIVER STORAGE PROJECT RESERVOIRS IN COMPUTING DEFICIENCY IN HOOVER BASIC FIRM ENERGY GENERATION

AUGUST 26, 1960.

Mr. IVAL GOSLIN,
Chairman, Engineering Committee,
Upper Colorado River Commission,
Salt Lake City, Utah.

DEAR MR. GOSLIN: On February 10, 1960, the Department issued proposed principles and operating criteria to govern filling of Glen Canyon Reservoir, the principal storage reservoir of the Colorado River storage project. Accompanying the proposed principles was a memorandum of explanation to the Secretary of the Interior from the Commissioner of Reclamation dated January 18, 1960.

In accordance with the Commissioner's recommendations, a series of meetings were held with representatives of the Lower and the Upper Colorado River Basin interests to explain the proposed principles and to receive the reactions thereto. Oral comments and suggestions for modification of the proposed principles were received at meetings held in Las Vegas, Nev., March 1960; in Los Angeles, Calif., May 1960; and in Boulder City, Nev., June 1960.

Written comments from the Upper Colorado River Commission were received by letter dated July 21, 1960, copies of which we understand have been made available to the lower basin interests.

I am encouraged by the cooperative spirit that has prevailed at these meetings and by the clearer understanding of the complexities and difficulties inherent in establishing principles and operating criteria that will provide a reasonable measure of equity to all concerned. Although the problems raised are difficult they are not insurmountable, and I am confident that with the continued cooperation of the various basin interests they can be resolved.

At the Boulder City, Nev., meeting it was suggested that the comments from the various interests be reviewed by the Bureau of Reclamation and a revised draft of general principles be prepared for consideration by the basin interests for review and discussion before the principles are prepared in final form. Pursuant to this suggestion representatives of the Bureau and of the Solicitor's Office of the Department of the Interior are now reviewing the proposed principles and operating criteria in light of the comments and suggestions received.

In formulating the proposed principles and operating criteria and in considering possible modifications thereto, our basic objective has been to secure a practical approach to the problems of filling Lake Powell, as distinguished from what might be considered a legalistic approach involving an attempt to establish principles and operating criteria on the basis of conclusions as to the perimeter of legal rights and obligations, with the consequent hazards which would attend such an approach. Consequently, we believe that irrespective of what might or might not be conceived by any party as the outer measure of its rights or obligations, the principles and operating criteria should be so framed that their application through a reasonable exercise of Secretarial discretion will result in equity to all concerned. On this basis it was proposed that a fair allowance be made for any deficiency in basic firm energy generation at Hoover powerplant resulting from the filling of the storage unit reservoirs.

At the Boulder City meeting representatives of the upper basin expressed, particularly, concern over the contemplated inclusion of evaporation from the storage unit reservoirs as a part of the reconstructed streamflow (i.e., the theoretical flow absent upstream storage unit reservoirs) used in the formula for computing allowance for deficiency in firm energy generation at Hoover powerplant during the filling period. Other than this general statement of position on the part of upper basin interests, we do not have the detailed views of any basin group on this specific point. Keeping in mind the observations made in the preceding paragraph, it would be helpful to us in further consideration of possible modification of the proposed principles and operating criteria to have a more detailed statement from the upper basin engineering committee containing its views as to the proper handling of evaporation losses in the determination of allowance to be made for deficiency in firm energy generation at Hoover powerplant. A similar request is being made to the lower basin engineering group.

Upon receipt of these views we hope to complete a tentative revision of the proposed principles and operating criteria for submittal to the Colorado River Basin interests for their consideration and comment prior to recommending to the Secretary adoption of final principles and operating criteria for the filling of the storage unit reservoirs.

Sincerely yours,

FLOYD E. DOMINY, *Commissioner.*

UPPER COLORADO RIVER COMMISSION,
Salt Lake City, Utah, January 27, 1961.

Hon. FLOYD E. DOMINY,
Commissioner, Bureau of Reclamation,
Department of the Interior, Washington, D.C.

DEAR COMMISSIONER DOMINY: In your letter of August 26, 1960, you requested that we provide a more detailed statement of our views as to the proper handling of evaporation losses in the determination of allowance to be made for deficiency in firm energy generation at Hoover powerplant. Our engineering committee has had the question of evaporation under study. At our recent meeting on January 9, which was attended by engineers from your staff, the matter was discussed in some detail.

We wish to make it clear, as was done at the Boulder City meeting, that our expression of concern over the inclusion of evaporation from storage project units was cited, not only to call attention to that specific problem, but also to indicate that the upper basin had objections to the proposed "general principles" of January 1960. At Boulder City we did not wish to leave the impression that we were agreeing to the "general principles" by our silence. Likewise, by this reply to your August 26 letter, which is concerned with the evaporation question exclusively, we do not intend to imply that we have no other objections to the proposed "general principles" of January 1960.

Evaporation from upper basin reservoirs should not be included in the reconstructed inflow to Lake Mead that is used in computing the so-called "basic firm" energy and deficiencies in Hoover powerplant generation.

It is a well-documented fact that long-time holdover storage of water in the upper basin is mandatory if the upper basin is to be able to develop the consumptive use of water that has been apportioned to it. There is no doubt in anyone's mind that the negotiators of the pertinent compacts and other documents constituting the "law of the river" recognized this condition and contemplated the storage of water upstream from Lee Ferry. The evaporation from storage units is to be regarded as a diminution of water supply associated with the necessity to store water for consumptive-use purposes in the upper basin. In a sense it is a necessary cost of doing business similar to the cost of snow removal being a necessity cost of providing public transportation. The situation with respect to upper basin reservoirs is no different from that with respect to lower basin reservoirs. Those reservoirs evaporate water, too, and diminish the water supply.

There is no more reason to include evaporation from upper basin storage units in reconstructing the inflow to Lake Mead for the computation of "basic firm" energy than there is for including the water consumptively used by the upper basin participating projects of Public Law 485, or by all of the upstream projects and reservoirs. You would agree that to include these latter mentioned items would be nothing short of ridiculous. In other words, there is no more reason to reconstruct the inflow to partially virgin-flow conditions for the benefit of Hoover powerplants than there is to reconstruct it to absolute virgin-flow conditions.

If upper basin evaporation is to be included in the theoretical Lake Mead inflow, the salvage of water due to the reduction of river losses resulting from the operation of the storage units and additional consumptive-uses in the upper basin should also be considered. This salvage would be substantial during the initial filling period under the proposed general principles.

It should be apparent that our objections to the inclusion of evaporation in the reconstructed inflow are aimed at the principle involved rather than at the amount of water or the magnitude of the additional deficiency in computed Hoover power generation. By the inclusion of evaporation in the inflow, Glen Canyon is forced to pay a penalty for power not generated at Hoover and is also required under the proposed criteria to furnish water during the filling period that is evaporated from the lower basin reservoirs. We fail to see the equity in penalizing the upper basin for exercising a right that belongs to it, the right to store water necessary for its development. It certainly must

have been the intention of the Colorado River compact negotiators to provide equality of opportunity to develop in both basins as well as to protect the deferment of that opportunity in the upper basin.

Perhaps our objection to the method of handling evaporation from upper basin reservoirs should be directed to the definition of "basic firm" of the "general principles" instead of to the method of computation set forth at the Boulder City meeting. If this be the case, "basic firm" should be redefined.

At the January 9, 1961, meeting of Bureau engineers and our committee, the argument was expressed that because all studies made by the engineers representing the Bureau, the lower basin and the upper basin have included evaporation from upper basin reservoirs in the computed inflow to Lake Mead, the reservoir filling criteria should also have the evaporated water included. This line of reasoning is without both foundation and logic. In the first place our office has made studies in which the evaporated water was excluded, and the results of these studies were forwarded to your office. Secondly, at no time has it been intended that the use of any of the basic data constituted an admission of fact. In the very beginning it was emphasized time after time that the studies were to be made for the purpose of determining the relative magnitudes of the effects of various assumed criteria, or, as graphically expressed by one of the Bureau's capable engineers, "to determine the size of the critter."

It was agreed that the same basic data would be used by all engineers in order to have the studies on a comparable basis. The following statement appears on page 8 of the status report "Glen Canyon Filling Studies, March 1959," prepared by the engineering group representing Arizona, Nevada, California, and the Bureau of Reclamation: "The first meeting of the group was devoted to discussing and agreeing upon the basic data and assumptions to be applied in the group studies, in order to provide a greater degree of comparability than was possible in some of the preliminary studies performed separately by the different parties. In all the studies discussed in detail herein the same basic data and assumptions were used. Therefore, results although not absolute owing to inherent limitations in this type of study and in the basic data and assumptions, are comparable and can be used to appraise the advantages and disadvantages of the various filling principles investigated."

Sincerely yours,

IVAL V. GOSLIN,
Chairman, Engineering Committee.

COLORADO RIVER COMMISSION OF NEVADA,
Las Vegas, Nev., October 10, 1960.

Mr. FLOYD E. DOMINY,
Commissioner, Bureau of Reclamation,
Department of the Interior, Washington, D.C.

DEAR MR. DOMINY: Your letter of August 26 addressed to me as chairman of the Colorado River Lower Basin Engineering Group has been reviewed by representatives of the group, particularly with respect to a statement regarding evaporation losses as requested in the third paragraph on page 2.

Paragraph 5 of the filling criteria of January 18, 1960, states, in part, that "* * * deficiency in firm energy shall be computed as the difference between firm energy which, assuming an overall efficiency of 83 percent, would have been generated * * * at Hoover powerplant in that year *if Glen Canyon had not been on the river* and the energy actually generated * * * during that year adjusted to reflect an overall efficiency of 83 percent." [italics added.]

The memorandum of January 18, accompanying the proposed criteria (p. 4), allows for computing deficiencies in Hoover generation which might be caused "* * * by Glen Canyon being on the river." Page 6 refers to Hoover basic firm as that generation which would be produced "without Glen Canyon on the river."

It is the position of the lower basin engineering group that the actual reduction in water supply available for energy generation at Hoover, during the filling period, will amount to the quantity withheld in the Colorado River storage project reservoirs regardless of whether the total quantity remains in storage or is in part lost by evaporation. The evaporation is part and parcel of such total reduction.

It is our understanding that evaporation losses are a part of the formula upon which the Secretary would compute these deficiencies.

Very truly yours,

A. J. SHAVER,
Chairman, Lower Basin Engineering Committee.

SIXTH ANNUAL REPORT
TO
THE CONGRESS OF THE UNITED STATES
COLORADO RIVER
STORAGE PROJECT
AND
PARTICIPATING PROJECTS
FOR THE FISCAL YEAR ENDED JUNE 30, 1962

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
BUREAU OF SPORT FISHERIES AND WILDLIFE
NATIONAL PARK SERVICE

COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

LEGISLATIVE AUTHORIZATION

Colorado River Storage Project and Participating Projects Act of April 11, 1956 (70 Stat. 105), and subsequent legislation.

AUTHORIZED FOR CONSTRUCTION

Storage units

- Curecanti
- Flaming Gorge
- Glen Canyon
- Navajo

Participating projects

- Central Utah (initial phase)
- Emery County
- Florida
- Hammond
- La Barge
- Lyman
- Navajo Indian irrigation
- Paonia
- Pine River extension [1]
- San Juan-Chama
- Seedskadee
- Silt
- Smith Fork

STEWART L. UDALL, Secretary of the Interior
FLOYD E. DOMINY, Commissioner of Reclamation

[1] On Sept. 25, 1959, a recommendation was made to the Congress that construction of this project be deferred indefinitely.

CONTENTS

		Page
Narrative of report:		
Introduction		73
Status of revenues		74
Cost of construction, operating, and maintaining the project		74
Allocation of Federal investment		78
Progress of return and repayment of Federal investment		79
Estimated rate of project repayment, year by year		79
Financial statement and schedules:		
Comparative balance sheets at June 30, 1962, and June 30, 1961.	Exhibit A.	
Notes to comparative balance sheets	Following exhibit A.	
Statement of source and application of funds and other credits.	Exhibit B.	
Construction work in progress	Schedule No. 1.	
Plant in service	Schedule No. 2.	
Service facilities	Schedule No. 3.	
Investigation costs (undistributed)	Schedule No. 4.	
Prepayments and advances	Schedule No. 5.	
Allocation of Federal investment (tentative)	Schedule No. 6.	

SIXTH ANNUAL REPORT, COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

INTRODUCTION

The Colorado River storage project and participating projects were initially authorized by the Congress on April 11, 1956 (70 Stat. 105). This act provided for the basinwide development and utilization of the water and land resources of the Upper Colorado River Basin. The authorized facilities will result in control of the flows of the Upper Colorado River in large reservoirs, will produce sizable blocks of hydroelectric power, will bring about irrigation of lands from upper basin tributary streams, and will supply water for municipal and industrial use.

Construction of the project by the Bureau of Reclamation began in 1956 on Glen Canyon Dam, and in 1958 on Flaming Gorge and Navajo Dams. In following years, construction was started on the Curecanti unit, the transmission system, and on the following participating projects: Emery County, Florida, Hammond, Paonia, Seedskadee, Smith Fork, and the Vernal unit of the central Utah project.

Fiscal year 1962 heralds three significant events in the development of the project. First, the substantial completion of the Paonia participating project in western Colorado. Second, the receipt of the first operating revenues from the sale of water on the Navajo storage unit in New Mexico. Third, authorization on June 13, 1962, by Public Law 87–483 of the Navajo Indian irrigation project and the San Juan-Chama project (initial stage) as participating projects.

Section 6 of the authorizing act stipulates that, on January 1 of each year, the Secretary of the Interior shall report to Congress for the previous fiscal year:

(1) Status of revenues from; and

(2) Cost of constructing, operating, and maintaining the Colorado River storage project and participating projects (hereinafter referred to as the "project").

The report is to be prepared so as to reflect accurately the—

(3) Federal investment allocated at that time to power, to irrigation, and to other purposes;

(4) Progress of return and repayment thereon; and

(5) Estimated rate of progress, year by year, in accomplishing full repayment.

Because of the nature of project activities during the fiscal year, this sixth annual report deals primarily with construction progress to June 30, 1962, and only limited comments are furnished with respect to the remaining items required to be reported upon.

1. Status of Revenues

Revenues received during fiscal year 1962 amounted to $6,529. Of this amount, $3,025 represents operating revenues from the sale of water from the Navajo storage unit under short-term water sales contracts, and $3,504 was collected from miscellaneous sources.

Total revenues to June 30, 1962, amount to $46,389 and were derived from the following sources:

Operating revenues: Sale of water	$3,025
Nonoperating revenues:	
Lease of land for grazing and agricultural use	31,765
Miscellaneous	11,599
Total	46,389

2. Cost of Constructing, Operating, and Maintaining the Project

The cost of constructing the project to June 30, 1962, is reflected in the following attached financial exhibits:

Exhibit A—Comparative balance sheets at June 30, 1962, and June 30, 1961.

Exhibit B—Statement of source and application of funds and other credits as of June 30, 1962.

Exhibit A sets forth comparatively the financial condition of the project at June 30, 1962, and June 30, 1961. The cumulative funds and other credits available to the project at June 30, 1962, and the manner in which such funds and credits were used or applied are set forth on exhibit B.

Activities during fiscal year 1962 were directed mainly to construction work on the storage project units, the transmission system, and on the Emery County, Florida, Hammond, Seedskadee, Smith Fork, Paonia, and Vernal unit participating projects. In addition, advance planning continued on the Crystal Dam, Reservoir, and powerplant of the Curecanti storage unit, and on the central Utah, La Barge, Lyman, and Silt participating projects. Costs incurred for these activities constitute the principal items of cost of constructing the project to June 30, 1962, and are summarized as follows:

Activity:	*Cost to date*
Construction work in progress	$278,240,521
Completed plant in service	7,423,214
Service facilities	14,776,879
Investigation costs (undistributed advance planning)	5,299,824
Total	305,740,438

Details with respect to the foregoing, identified by project or activity, are shown respectively on schedules Nos. 1, 2, 3, and 4, attached.

Highlights of certain of the major activities are set forth in the following paragraphs:

CURECANTI STORAGE UNIT, COLORADO

Construction work continued on the relocation of segments of U.S. Highway 50 and Colorado State Highway 92 to bypass the Blue Mesa Reservoir site. The prime contract for construction of the Blue Mesa Dam, powerplant, and switchyard was awarded in April 1962 for $13,706,230. In addition, contracts were awarded for construction of

temporary field office, laboratory, warehouse, and garage buildings. Surveys and preparation of designs are underway for the Morrow Point Dam, powerplant, and switchyard. The prime contract for the Morrow Point Dam will be awarded in the spring of 1963.

FLAMING GORGE STORAGE UNIT, UTAH

Construction of the concrete arch dam on the upper Green River in Utah is 82 percent complete, and by November 1962 the dam will be "topped out" at a height of 502 feet above bedrock. A separate contract was awarded in February 1962 for completion of the powerplant and switchyard. Fabrication of powerplant turbines and generators was well underway with the turbines 64 percent complete and generators 55 percent complete. Closure of the single diversion tunnel will be accomplished in the fall of 1962, and filling of the 91-mile-long reservoir will begin. The first of the three power-generating units is expected to be placed on the line in September 1963. The remaining two units will be in service by March 1964. The powerplant will have a total generating capacity of 108,000 kilowatts.

GLEN CANYON STORAGE UNIT, ARIZONA

Progress on the $133,793,000 prime contract for construction of the 710-foot-high concrete arch dam and the 900,000-kilowatt powerplant is slightly ahead of schedule with physical completion estimated at 75 percent. Glen Canyon Dam is expected to be completed in March 1964.

The contractor has placed 3.4 million cubic yards of concrete of the total 5.4 million required to complete the dam and appurtenant works. Completion of the powerplant, switchyard, and appurtenant works will be under a separate contract for $7,891,272 awarded in June 1962.

Fabrication of the eight powerplant turbines and generators is 22 percent and 7 percent completed, respectively. According to present plans, initial power generation will begin in June 1964.

Closure of Glen Canyon Dam is scheduled early in 1963.

NAVAJO STORAGE UNIT, NEW MEXICO

Navajo Dam has been under construction for 4 years and is nearing completion at June 30, 1962, with 96 percent of the work completed under the $26,196,000 contract. It is expected that the earthfill dam will be substantially completed in August 1962.

Minor work remains under relocation contracts for relocation of powerlines, county roads, and segments of Denver & Rio Grande Western Railroad around the reservoir area.

Navajo Dam will be the first major feature of the storage unit to be completed. Storage of water in the 35-mile-long reservoir began in June 1962. The impoundment of water at Navajo will be the first at any of the storage units of the Colorado River storage project.

TRANSMISSION DIVISION

Construction of the Flaming Gorge to Green Mountain 138-kilovolt transmission lines continued during the year and was 95 percent complete at June 30, 1962. Work was started on the Glen Canyon-Shiprock 230-kilovolt transmission line, the Morrow Point-Curecanti

230-kilovolt line, and the Gunnison-Blue Mesa-Curecanti-Montrose 115-kilovolt transmission line. A contract was awarded in April 1962 for construction of the Vernal substation with completion scheduled for June 1963. Construction contracts were awarded in fiscal year 1962 for the construction of the Glen Canyon-Pinnacle Peak 345-kilovolt line, the Shiprock-Cortez-Curecanti 230-kilovolt line, and the Curecanti-Hayden 230-kilovolt line.

Preconstruction activities are underway on various other transmission lines and interconnection facilities in accordance with the agreements reached with the private utilities and preference customers.

CENTRAL UTAH PARTICIPATING PROJECT, VERNAL UNIT, UTAH

Work on the Steinaker service canal was nearly complete with progress to date estimated at 96 percent. Construction of the Ashley Valley water system is 98 percent complete at June 30, 1962. The earthfill Steinaker Dam, the Fort Thornburgh diversion dam, and the Steinaker feeder canal were all substantially completed in fiscal year 1961.

Irrigation water and municipal water supply will be available from the project works beginning with the 1963 irrigation season.

EMERY COUNTY PARTICIPATING PROJECT, UTAH

Funds were appropriated in fiscal year 1962 to initiate construction activities. Activity during the fiscal year was directed mainly to designs and surveys of project features and the construction of temporary service facilities.

Construction of Joes Valley Dam and Reservoir, the project's main storage facility, is scheduled to begin in fiscal year 1963. Construction of the other major features, including Huntington North Dam and Reservoir, the Swasey diversion dam, about 20 miles of new canals, 10 miles of lining in existing canals, and nearly 25 miles of drains, will follow.

FLORIDA PARTICIPATING PROJECT, COLORADO

Lemon Dam and Reservoir, the major feature of the Florida project, is now under construction, and progress to date is estimated at 40 percent.

A contract for construction of irrigation facilities to be operated in conjunction with the Lemon Dam and Reservoir was awarded in March 1962. These facilities, when completed, will include the Florida Farmers diversion dam on the Florida River which will divert water for irrigation into the existing Florida Farmers Ditch and Florida Canal, both of which will be enlarged and relocated under the contract.

Construction of this project is scheduled for completion before the start of the 1964 irrigation season.

HAMMOND PARTICIPATING PROJECT, NEW MEXICO

Work on the principal features of the Hammond project had been completed by June 30, 1962. These completed features include the Hammond diversion dam on the San Juan River which will divert natural streamflows into the 29-mile-long main canal. Additional

construction work remains on the laterals and the hydraulic pumping plant.

Completion of the entire project except for minor cleanup activities is scheduled for fiscal year 1963. Irrigation water was available in limited amounts beginning with the 1962 irrigation season.

PAONIA PARTICIPATING PROJECT, COLORADO

Construction of the Paonia Dam on the North Fork of the Gunnison River was essentially completed early in 1962, and the 21,000 acre-foot Paonia Reservoir was filled during the spring runoff. Paonia Dam is the main feature of the Paonia project, which has the distinction of being the first participating unit of the five-State Colorado River storage project to be placed in operation. The completed portions of the project were turned over to the North Fork Water Conservancy District on June 1, 1962, for operation and maintenance. Other project features include the Fire Mountain diversion dam and several miles of irrigation canal.

SEEDSKADEE PARTICIPATING PROJECT, WYOMING

The principal features of the Seedskadee project are the Fontenelle Dam and Reservoir on the Green River, a 10,000-kilowatt powerplant and switchyard, a system of canals, two pumping plants, laterals and drainage facilities. Construction of the Fontenelle Dam is 34 percent complete under a construction contract for $8,145,545 awarded in June 1961. Other construction activities were directed mainly to construction of the Fontenelle community.

The community is essentially completed and includes housing, both permanent and temporary, for about 30 Reclamation employees and their families, along with shops, garages, an office, fire station, and a laboratory. The permanent facilities will serve as the project operation headquarters after completion of the project.

SMITH FORK PARTICIPATING PROJECT, COLORADO

The Crawford Dam on Iron Creek in west-central Colorado is 88 percent completed at June 30, 1962. Construction is underway on the other project features including the Smith Fork diversion dam which will divert surplus flows from the Smith Fork, a 2¾-mile feeder canal to carry the surplus flow from the Smith Fork to the reservoir, and a new 6.6-mile Aspen Canal to deliver the water to the farmlands in the project area. Work on these features is estimated 81 percent complete.

Initial storage of water is scheduled to begin in the fall of 1962, and irrigation water will be available in limited amounts during the 1963 irrigation season.

ADVANCE PLANNING ACTIVITIES

Definite plan reports on the Silt participating project in Colorado, the Emery County participating project in Utah, and the economic justification report on Crystal Dam, reservoir, and powerplant of the Curecanti unit were completed during the year. Advance planning studies continued on the central Utah project and in Wyoming on

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the Lyman project. Quality of water studies were continued in the Upper Colorado River Basin as authorized by law.

FISH AND WILDLIFE FACILITIES

Fishery rehabilitation programs were initiated on the San Juan and Green Rivers prior to closure of the Navajo and Flaming Gorge Dams. The rough-fish eradication program for approximately 67 miles of the San Juan River and its tributaries was completed in September 1961 in cooperation with both the Colorado and New Mexico fish and game departments. Work was begun under a $150,000 contract with the Utah and Wyoming fish and game departments for a similar program in a 445-mile stretch of the Green River and its tributaries. These measures are intended to assure improved populations of game fish in the rivers and to establish an optimum reservoir fishery during the initial years of impoundment.

A contract was awarded in June for the installation of a pump at the Stewart Lake State Waterfowl Refuge in Utah to replace the source of water impaired by project operations.

Planning activities for future facilities, including appraisal of water supply and site locations for wildlife management areas and fish hatcheries, continued throughout fiscal year 1962.

PUBLIC RECREATION FACILITIES

Activities relative to the provision of visitor facilities consisted primarily of the planning and designing of developments in the Glen Canyon, Flaming Gorge, and Navajo Reservoir areas. These include roads, parking areas, boat-launching ramps, campgrounds, picnic areas, utilities, comfort stations, beach developments, and miscellaneous administrative facilities.

In addition, in the Glen Canyon National Recreation Area, construction of utility and campground projects has been completed and two employee residences are 60-percent complete. In the Flaming Gorge Recreation Area, a temporary office building was completed; and in the Navajo Reservoir Recreation Area, a contract was awarded for construction of the boat-launching ramp.

3. Allocation of Federal Investment

Section 6 of the authorizing act states that upon completion of each unit, participating project, or separable feature thereof, the Secretary shall allocate the total cost of constructing said unit, project, or feature to the various purposes authorized in the act or authorized under reclamation law. No formal allocations to the several purposes to be served by the project have been made of the cost to June 30, 1962. However, tentative allocations have been made of the total estimated cost of projects now under construction (schedule No. 6). The tentative allocations are summarized as follows:

Purpose	Amount (thousands)	Percent
Reimbursable allocations:		
Irrigation	$163,893	19.6
Power	606,057	72.3
Municipal and industrial water	1,469	.2
Total	771,419	92.1
Nonreimbursable allocations:		
Flood control	1,889	.2
Fish and wildlife	30,289	3.6
Recreation	30,267	3.6
Other nonreimbursable costs: Colorado River development fund investigations and non-Federal contributions	4,187	.5
Total	66,632	7.9
Total	838,051	100.0

NOTE.—The above allocation includes only those projects now under construction

4. PROGRESS OF RETURN AND REPAYMENT OF FEDERAL INVESTMENT.

No progress has been made on repayment of the Federal investment as a result of operations. However, repayment contracts which schedule annual payments on irrigation construction facilities have been negotiated and executed with water users organizations on the following participating projects:

	Amount
Central Utah, Vernal unit: Uintah Water Conservancy District, July 14, 1958	$1,500,000
Emery County: Emery Water Conservancy District, May 15, 1962	2,935,000
Hammond: Hammond Conservancy District, Oct. 20, 1959	450,000
Paonia: North Fork Water Conservancy District, Aug. 21, 1957	2,320,000
Smith Fork: Crawford Water Conservancy District, May 10, 1960	1,025,000
Florida: Florida Water Conservancy District, Dec. 29, 1960	1,900,000
Total	10,130,000

5. ESTIMATED RATE OF PROJECT REPAYMENT, YEAR BY YEAR

Final cost allocations of the Federal investment to power, irrigation, and to other purposes have not been made. Accordingly, no estimated rate of progress of project repayment year by year of the investment to be so allocated is included.

80 COLORADO RIVER STORAGE PROJECT

COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

Exhibit A.—Comparative balance sheets

ASSETS

	June 30—		Increase (decrease)
	1962	1961	
Construction work in progress (schedule No. 1) [1]	$278,240,521	$183,307,024	$94,933,497
Plant in service (schedule No. 2)	7,423,214	1,599,704	5,823,510
Service facilities (schedule No. 3)	14,776,879	14,175,124	601,755
Investigation costs (schedule No. 4)	5,299,824	4,348,207	951,617
Current assets:			
Cash and fund balances with U.S. Treasury:			
Operating funds [2]	27,500,671	65,182,547	(37,681,876)
Deposit funds [3]	4,415,751	6,194,466	(1,778,715)
Accounts receivable:			
Government agencies	46,864	14,234	32,630
Other	66,175	64,194	1,981
Materials and supplies	312,542	252,272	60,270
Prepayments and advances (schedule No. 5)	571,336	457,255	114,081
Total current assets	32,913,339	72,164,968	(39,251,629)
Other assets:			
Undistributed and deferred charges	470,787	186,767	284,020
Deferred and unmatured receivables	150,757	305,812	(155,055)
Total other assets	621,544	492,579	128,965
Total assets	339,275,321	276,087,606	63,187,715

LIABILITIES

Net investment:			
United States:			
Congressional appropriations [4]	$307,374,248	$251,981,177	$55,393,071
Transfer of property and services	4,344,490	4,257,029	87,461
Interest during construction capitalized	10,366,381	4,748,975	5,617,406
Total	322,085,119	260,987,181	61,097,938
Less:			
Funds returned to U.S. Treasury	52,175	52,175	
Nonreimbursable expense [5]	206,581	141,530	65,051
Total	258,756	193,705	65,051
Total net investment, United States	321,826,363	260,793,476	61,032,887
Non-Federal contributions	201,740	249,733	(47,993)
Accumulated net nonoperating income	46,389	39,860	6,529
Total net investment	322,074,492	261,083,069	60,991,423
Current liabilities:			
Accrued liabilities	4,415,751	6,189,016	(1,773,265)
Accounts payable:			
Government agencies	280,060	137,761	142,299
Other	12,488,002	8,672,280	3,815,722
Total current liabilities	17,183,813	14,999,057	2,184,756
Other deferred credits	17,016	5,480	11,536
Total liabilities	339,275,321	276,087,606	63,187,715

[1] Construction work in progress: Construction work in progress includes certain completed features, e.g., Glen Canyon bridge and access road, etc., aggregating $13,296,853.

[2] Operating funds:

Amount committed to payment of unliquidated obligations and accounts payable	$23,271,840
Other unobligated balance	4,228,831
Total	27,500,671

[3] Deposit funds:

Retained percentages of contractors' earnings	$4,412,836
Utility deposits	2,915
Total	4,415,751

[1] Congressional appropriations: Total congressional appropriations for the Colorado River storage project amounted to $55,468,000 in fiscal year 1962. During this fiscal year appropriation transfers amounting to $74,929 were turned over to Public Buildings Service, General Services Administration, for lease space rentals in accordance with Public Law 87-141, approved Aug. 17, 1961 (75 Stat. 353), and Bureau of the Budget Bulletin No. 62-4, dated Sept. 29, 1961.

[2] Nonreimbursable expense: Cost of quality of water studies required by sec. 15, Public Law 485, 84th Cong., $206,581.

GENERAL NOTE

Value of repayment contracts: Long-term repayment contracts, no part of which have matured at June 30, 1962, have been executed with water users' organizations for the repayment of the portion of the investment in irrigation. At that date such contracts amounted to $10,130,000.

EXHIBIT B.—*Statement of source and application of funds and other credits, June 30, 1962*

	Total	Storage project units			
		Curecanti	Flaming Gorge	Glen Canyon	Navajo
Source of funds and other credits:					
Congressional appropriations:					
Prior fiscal years	$251,381,177	$2,400,000	$40,213,335	$146,491,358	$31,911,525
Fiscal year 1962	55,393,071	4,652,127	6,278,284	13,736,406	3,630,500
Total direct appropriations	[1] 306,774,248	7,052,127	46,491,619	160,227,764	35,542,025
Transfer appropriations, Bureau of Public Roads	600,000			600,000	
Total congressional appropriations	307,374,248	7,052,127	46,491,619	160,827,764	35,542,025
Non-Federal contributions	201,740	35,000	43,043	60,065	
Net transfers-in of property or services without charge	4,344,490	453,605	230,433	1,040,710	133,958
Interest during construction capitalized	10,366,381	91,610	1,596,647	8,402,224	
Net nonoperating income	46,389		5,343	3,038	4,094
Total	322,333,248	7,632,342	48,367,085	170,333,801	35,680,077
Application of funds and other credits:					
Plant in service:					
Irrigation	2,076,301				
Multipurpose	5,346,913				
Construction work in progress	278,240,521	6,051,943	43,075,623	157,384,450	34,428,337
Service facilities (net)	14,776,879	646,941	3,824,500	8,561,268	239,096
Investigation costs	5,299,824			117,133	
Nonreimbursable expense: Quality-of-water studies	206,581				
Funds returned to U.S. Treasury	52,175		4,882	3,038	910
Working capital (see below)	16,334,054	933,458	1,462,080	4,267,912	1,011,734
Total	322,333,248	7,632,342	48,367,085	170,333,801	35,680,077
Analysis of working capital:					
Current and deferred assets:					
Operating fund balance with U.S. Treasury	27,500,671	2,190,276	3,891,082	8,875,790	1,993,774
Deposit funds with U.S. Treasury	4,415,751	37,720	794,290	2,177,448	407,633
Accounts receivable	113,039	50	53,832	25,618	25,344
Inventories	312,542	149	30,848	274,279	2,892
Prepayments and advances	571,336	103,816	12,379	87,707	18,531
Deferred and unmatured receivables	150,757			150,757	
Deferred and undistributed charges	470,787	107	47,238	18,548	21,279
Total	33,534,883	2,332,118	4,829,669	11,610,153	2,459,453

Current and deferred liabilities:					
Accounts payable	12,768,062	1,360,940	2,573,209	5,153,227	1,040,086
Trust and deposit liabilities	4,415,751	37,720	794,290	2,177,448	407,633
Deferred and undistributed credits	17,016			11,566	
Total	17,200,829	1,398,660	3,367,589	7,342,241	1,447,719
Working capital	16,334,054	933,458	1,462,080	4,267,912	1,011,734

[1] Includes $2,046,067 appropriated to the original Paonia project (authorized June 25, 1947).
[2] Does not include $74,929 representing appropriation transfers to GSA for lease space requirements.

EXHIBIT B.—*Statement of source and application of funds and other credits, June 30, 1962*—Continued

	Participating projects							Transmission division	Advance planning	Fish and wildlife development	Recreational development
	Central Utah	Emery County	Florida	Hammond	Paonia	Seedskadee	Smith Fork				
Source of funds and other credits:											
Congressional appropriations:											
Prior fiscal years	$5,174,000		$862,500	$1,592,500	[1] $7,080,442	$2,200,570	$1,850,500	$6,207,003	$5,388,444		
Fiscal year 1962	1,418,000	$450,000	3,699,228	1,702,500	223,000	3,776,861	2,027,000	9,586,665	1,279,000	$663,000	$2,270,500
Total direct appropriations	6,592,000	450,000	4,561,728	3,295,000	7,303,442	5,986,431	3,877,500	15,793,668	6,667,444	663,000	2,270,500
Transfer appropriations, Bureau of Public Roads											
Total congressional appropriations	6,592,000	450,000	4,561,728	3,295,000	7,303,442	5,986,431	3,877,500	15,793,668	6,667,444	663,000	2,270,500
Non-Federal contributions	3,565	1,436						27	58,604		
Net transfers-in of property or services without charge	501,879	371,732	332,877	286,152	199,023	1,248,386	343,206	164,467	(961,939)		
Interest during construction capitalized	33,582					5,086		237,232			
Net nonoperating income					24,368	8,022			1,524		
Total	7,131,026	823,168	4,894,605	3,581,152	7,526,833	7,247,925	4,220,706	16,195,394	5,765,634	663,000	2,270,500
Application of funds and other credits:											
Plant in service:											
Irrigation					2,076,301						
Multipurpose					5,346,913						
Construction work in progress	6,844,348	475,307	4,717,157	3,272,350		5,656,558	3,934,549	11,742,135		212,284	445,480
Service facilities (net)	52,362	37,519	57,379	91		887,578	142,392	132,313	195,440		
Investigation costs					18,794				5,163,897		
Nonreimbursable expense: Quality-of-water studies									206,581		
Funds returned to U.S. Treasury					30,683	5,397			1,265		
Working capital (see below)	234,315	310,343	120,070	308,710	48,142	698,392	143,765	4,320,946	198,451	450,716	1,825,020
Total	7,131,025	823,169	4,894,606	3,581,151	7,526,833	7,247,925	4,220,706	16,195,394	5,765,634	663,000	2,270,500

Analysis of working capital:											
Current and deferred assets:											
Operating fund balance with U.S. Treasury	372,132	303,962	488,418	363,974	95,659	1,216,527	320,218	4,022,746	241,596	610,663	1,623,848
Deposit funds with U.S. Treasury	104,846	166	266,546	29,590	47,508	235,012	71,941	233,131	9,920	.....	.....
Accounts receivable	932	.....	.....	.....	.....	1,059	.....	5,612	892	.....	.....
Inventories	.....	.....	.....	.....	.....	1,656	.....	.....	2,718	.....	.....
Prepayments and advances	13,768	23,529	22,309	18,380	10,667	72,302	26,176	97,713	64,059	.....	.....
Deferred and unmatured receivables	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Deferred and undistributed charges	2,069	272	927	33	12	183,061	16	(2,391)	(1,556)	.....	201,172
Total	493,747	327,929	778,200	411,977	153,846	1,709,617	418,351	5,256,811	317,329	610,663	1,825,020
Current and deferred liabilities:											
Accounts payable	154,586	17,420	391,564	73,677	52,746	776,213	202,645	702,734	108,958	159,947	.....
Trust and deposit liabilities	104,846	166	266,546	29,590	47,508	235,012	71,941	233,131	9,920	.....	.....
Deferred and undistributed credits	.....	.....	.....	.....	5,450	.....	.....	.....	.....	.....	.....
Total	259,432	17,586	658,130	103,267	105,704	1,011,225	274,586	935,865	118,878	159,947	.....
Working capital	234,315	310,343	120,070	308,710	48,142	698,392	143,765	4,320,946	198,451	450,716	1,825,020

SCHEDULE No. 1.—*Construction work in progress, June 30, 1962*

Property class	Total	Storage units			
		Curecanti	Flaming Gorge	Glen Canyon	Navajo
Dams and reservoirs	$202,306,570	$5,671,906	$32,804,939	$112,770,180	$34,428,337
Diversion works	660,488				
Pumping plants	383,004				
Canals and conduits	6,280,603				
Laterals	615,937				
Drains	233,418				
Powerplants, hydro	43,885,149	278,520	7,935,410	35,621,934	
Transmission lines, switchyards, substations	12,835,000	9,907	726,023	590,112	
General property	16,148		12,604		
Interest during construction capitalized	10,366,380	91,610	1,596,647	8,402,224	
Subtotal	277,582,757	6,051,943	43,075,623	157,384,450	34,428,337
Public recreation facilities	445,480		4,734	431,333	9,413
Fish and wildlife facilities	212,284	1,438	172,820		26,378
Total	278,240,521	6,053,381	43,253,177	157,815,783	34,464,128
Summary:					
Total June 30, 1961	183,307,024	1,777,676	25,103,052	110,816,708	27,386,280
Fiscal year activity:					
Additions	100,835,407	4,275,705	18,150,125	46,999,075	7,077,848
Transfers of completed work	(5,901,910)				
Total	278,240,521	6,053,381	43,253,177	157,815,783	34,464,128

[1] Project completed and construction cost transferred to plant-in-service accounts.

Property class	Participating projects							Transmission division
	Central Utah	Emery County	Florida	Hammond	Paonia	Seedskadee	Smith Fork	
Dams and reservoirs	$4,181,340	$305,203	$4,405,027			$4,484,798	$3,284,840	
Diversion works		11,840	46,284	$902,364				
Pumping plants				286,781		96,283		
Canals and conduits	2,596,871	121,304	198,362	2,112,909		601,388	649,709	
Laterals			67,484	265,592		282,861		
Drains	62,555	36,960		1,100		132,803		
Powerplants, hydro						49,285		
Transmission lines, switchyards, substations						4,054		$11,504,904
General property				3,544				
Interest during construction capitalized	83,582					5,086		237,231
Subtotal	6,844,348	475,307	4,717,157	3,272,350		5,656,558	3,934,549	11,742,135
Public recreation facilities								
Fish and wildlife facilities	10,211			1,437				
Total	6,854,559	475,307	4,717,157	3,273,787	(1)	5,656,558	3,934,549	11,742,135
Summary:								
Total June 30, 1961	4,838,512		1,032,253	1,441,949	$5,340,881	1,918,201	1,763,130	1,888,382
Fiscal year activity:								
Additions	2,016,047	475,307	3,684,904	1,831,838	561,029	3,738,357	2,171,419	9,853,753
Transfers of completed work					(5,901,910)			
Total	6,854,559	475,307	4,717,157	3,273,787		5,656,558	3,934,549	11,742,135

SCHEDULE NO. 2.—*Plant in service, June 30, 1962*

Property class	Amount
Paonia participating project:	
Dams and reservoirs	$5,346,913
Diversion works	129,489
Canals and conduits	1,946,812
Total	7,423,214

SCHEDULE NO. 3.—*Service facilities, June 30, 1962*

Structures	Total	Storage units			
		Curecanti	Flaming Gorge	Glen Canyon	Navajo
Permanent housing	$5,410,159		$1,347,965	$3,670,086	$210,965
Temporary housing	868,779	$60,000	180,199	373,517	
Warehouse buildings	642,171		75,261	540,302	
Administration buildings	525,359		124,053	305,126	
Municipal building	116,001			116,001	
Police buildings, garages, fire stations	409,173	49,710	77,165	239,612	7,884
Sewers, water systems, electrical distribution	3,428,569	15,521	1,153,569	2,080,258	157,486
Streets, street improvements, access roads	3,493,348		1,164,653	2,118,850	
Airstrip	322,650			322,650	
Other structures	1,430,089	442,214	218,513	579,601	85,863
Miscellaneous equipment	2,368,458	95,419	538,961	742,946	134,021
Total	19,014,756	662,864	4,880,339	11,088,949	596,219
Less accumulated depreciation to date (transferred to construction work in progress)	4,237,877	15,923	1,055,839	2,527,681	357,123
Total	14,776,879	646,941	3,824,500	8,561,268	239,096
Additions:					
Prior fiscal years	14,175,124	22,891	4,136,390	8,897,282	344,694
Fiscal year 1962	601,755	624,050	(311,890)	(336,014)	(105,598)
Total	14,776,879	646,941	3,824,500	8,561,268	239,096

SCHEDULE No. 3.—*Service facilities, June 30, 1962*—Continued

Structures	Participating projects							Transmission division	Advance planning
	Central Utah	Emery County	Florida	Hammond	Paonia	Seedskadee	Smith Fork		
Permanent housing						$181,143			
Temporary housing		$4,999				149,835	$100,229		
Warehouse buildings						19,793	6,815		
Administration buildings						92,750	3,430		
Municipal building									
Police buildings, garages, fire stations						34,802			
Sewers, water systems, electrical distribution						21,735			
Streets, street improvements, access roads						206,446	3,399		
Airstrip									
Other structures	$17,629	10,595				72,161			3,513
Miscellaneous equipment	56,746	22,090	$63,529	$109		122,725	29,443	$175,306	$387,163
Total	74,375	37,684	63,529	109		901,390	143,316	175,306	390,676
Less accumulated depreciation to date (transferred to construction work in progress)	22,013	165	6,150	18		13,812	924	42,993	195,236
Total	52,362	37,519	57,379	91		887,578	142,392	132,313	195,440
Additions:									
Prior fiscal years	60,836		41,562	103	$167,201	217,731	11,025	74,024	201,385
Fiscal year 1962	(8,474)	37,519	15,817	(12)	(167,201)	669,847	131,367	58,289	(5,945)
Total	52,362	37,519	57,379	91		887,578	142,392	132,313	195,440

Colorado River storage project and participating projects

SCHEDULE NO. 4.—*Investigation Costs, June 30, 1962 (undistributed)*

Description	Amount
Curecanti storage unit (Crystal)	$145,709
Glen Canyon storage unit (Rainbow Bridge protective works)	117,133
Participating projects:	
Central Utah (excludes Vernal unit)	3,655,565
Lyman	661,586
La Barge	221,707
Pine River extension	136,496
Silt	342,834
Paonia	18,794
Total	5,299,824

Colorado River storage project and participating projects

SCHEDULE NO. 5.—*Prepayments and advances, June 30, 1962*

Advances to other Bureau of Reclamation activities performing services for the project are reflected in the accounting records of such entities in the following manner:

Fund balances with U.S. Treasury:	
Centralized projects activities	$166,045
Denver office	558,843
Accounts receivable: Centralized projects activities	9,314
Accounts payable: Centralized projects activities	(162,866)
Total	571,336

SCHEDULE No. 6.—*Preliminary allocation of Federal investment for units and projects under construction*

[Dollars in thousands]

	Total	Allocation to purposes									
		Reimbursable costs					Nonreimbursable costs			Sec. 8 costs	
		Irrigation	Power]		Municipal and industrial water		Flood control	Fish and wildlife	Other [1]	Fish and wildlife	Recreation
			Construction cost	Interest during construction	Construction cost	Interest during construction					
Storage project:											
Curecanti unit, Colorado	$82,133	$2,192	$66,095	$4,074			$1,444		$119	$3,235	$4,974
Flaming Gorge unit, Utah	77,344	12,054	47,949	3,306				$3,679	87	1,194	6,075
Glen Canyon unit, Arizona	363,769	40,545	274,424	23,743				6,122	3,043	200	15,692
Navajo unit, New Mexico	40,228	31,059					197	5,751	65	562	2,594
Transmission division	182,388		176,145	6,143					100		
Total	745,862	85,850	564,613	37,266			1,641	18,552	3,414	5,191	29,335
Participating projects:											
State of Colorado:											
Florida	10,961	9,031					176	1,641	22	10	81
Paonia	7,842	7,541					72		156	10	63
Smith Fork	4,616	4,241						189	72	10	104
State of New Mexico: Hammond	3,838	3,713						107	8	10	
State of Utah:											
Central Utah, Vernal unit	8,043	6,980			$542	$35		148	86	28	224
Emery County	11,910	9,277						2,340	18	205	70
State of Wyoming: Seedskadee	44,979	37,200	4,075	103	837	55		607	411	1,241	390
Subtotal	92,189	78,043	4,075	103	1,379	90	248	5,032	773	1,514	932
Total	838,051	163,893	568,688	37,369	1,379	90	1,889	23,584	4,187	6,705	30,267

[1] Colorado River development fund investigations and non-Federal contributions.

○

602

PART I. BASIC DOCUMENTS

GENERAL PRINCIPLES TO GOVERN, AND OPERATING CRITERIA FOR, GLEN CANYON RESERVOIR (LAKE POWELL) AND LAKE MEAD DURING THE LAKE POWELL FILLING PERIOD

1. The following principles and criteria are based on the exercise, consistent with the law of the river, of reasonable discretion by the Secretary of the Interior in the operation of the Federal projects involved. The case generally *"Arizona* v. *California, et al. No. 9 Original"* is in litigation before the Supreme Court of the United States. Anything which is provided for herein subject to change consistent with whatever rulings are made by the Supreme Court which might affect the principles and criteria herein set out. They may also be subject to change due to future acts of the Congress.

2. The principles and criteria set forth hereinafter are applicable during the Lake Powell filling period, which is defined as that time interval between the date Lake Powell is first capable of storing water (estimated to occur in the spring of 1963) and the date Lake Powell storage first attains elevation 3,700 (content 28.0 million acre-feet total surface storage) and Lake Mead storage is simultaneously at or above elevation 1,146 (content 17.0 million acre-feet available surface storage), or May 31, 1987, whichever occurs first. If, in the judgment of the Secretary, the contents of Lake Powell and Lake Mead warrant such action, and after consultation with appropriate interests of the Upper Colorado River Basin and the Lower Colorado River Basin, the Secretary may declare that in not less than 1 year from and after the date of such declaration these principles and criteria are no longer applicable.

3. Sufficient water will be passed through or released from either or both Lake Mead and Lake Powell, as circumstances require under the provisions of principles 7 and 8 hereof, to satisfy downstream uses of water (other than for power) below Hoover Dam which uses include the following:

(a) Net river losses.

(b) Net reservoir losses.

(c) Regulatory wastes.

(d) The Mexican Treaty obligation limited to a scheduled 1.5 million acre-feet per year.

(e) The diversion requirements of mainstream projects in the United States.

4. All uses of water from the main stem of the Colorado River between Glen Canyon Dam and Lake Mead will be met by releases from or water passed through Lake Powell and/or by tributary inflow occurring below Glen Canyon Dam. Diversions of water directly out of Lake Mead will be met in a similar manner or, if application of the criteria of principles 7 and 8 hereof should so require, by water stored in Lake Mead.

5. The United States will make a fair allowance for any deficiency, computed by the method herein set forth, in firm energy generation at Hoover powerplant. For each operating year deficiency in firm energy shall be computed as the difference between firm energy which, assuming an overall efficiency of 83 percent, would have been generated and delivered at transmission voltage at Hoover powerplant in that year if water has not been impounded in the reservoirs of the Colorado River storage project storage units (Glen Canyon, Flaming Gorge, Navajo, and Curecanti), but excluding the effects of evaporation from the surface of such reservoirs, and the energy actually generated and delivered at transmission voltage at Hoover powerplant during that year adjusted to reflect an overall efficiency of 83 percent. At the discretion of the Secretary, allowance will be accomplished by the United States delivering energy, either at Hoover powerplant or at points acceptable to both the Secretary and the affected Hoover power contractors, or monetarily in an amount equal to the incremental cost of generating substitute energy. To the extent the Upper Colorado River Basin fund is utilized the moneys expended therefrom in accomplishing the allowance, either through the delivery of purchased energy or by direct monetary payments, shall be reimbursed to said fund from the separate fund identified in section 5 of the act of December 21, 1928 (45 Stat. 1057), to the extent such reimbursement is consistent with the expenditures Congress may authorize from said separate fund pursuant

to said act. The attached additional regulation No. 1 for generation and sale of power in accordance with the Boulder Canyon Project Adjustment Act, upon issuance, will be made a part of these principles and criteria.

6. In accomplishing the foregoing, Lake Powell will be operated in general accordance with the provisions of principles 7 and 8.

7. Storage capacity in Lake Powell to elevation 3,490 (6.5 million acre-feet surface storage) shall be obtained at the earliest practicable time in accordance with the following procedure:

Until elevation 3,490 is first reached, any water stored in Lake Powell shall be available to maintain rated head on Hoover powerplant. When stored water in Lake Powell has reached elevation 3,490, it will not be subject to release or diminution below elevation 3,490. The obtaining of this storage level in Lake Powell will be in such manner as not to cause Lake Mead to be drawn down below elevation 1,123 (14.5 million acre-feet available surface storage), which corresponds to rated head on the Hoover powerplant. In the process of gaining storage to elevation 3,490, the release from Glen Canyon Dam shall not be less than 1.0 million acre-feet per year and 1,000 cubic feet per second, as long as inflow and storage will permit.

The operation of Lake Powell above elevation 3,490 and Lake Mead will be coordinated and integrated so as to produce the greatest practical amount of power and energy. In view of the provision for allowance set forth in principle 5 hereof, the quantity of water released through each powerplant will be determined by the Secretary in a manner appropriate to meet the filling criteria.

9. In general, it is not anticipated that secondary energy will be generated at Hoover during the filling period. However, any secondary energy, as defined in the Hoover contracts, which may be generated and delivered at transmission voltage at Hoover powerplant will be disposed of under the terms of such contracts.

10. In the annual application of the flood control regulations to the operation of Lake Mead, recognition shall be given to available capacity in upstream reservoirs.

Approved, April 2, 1962.

STEWART L. UDALL,
Secretary of the Interior.

(Published in Federal Register, 27 F.R. 6851 (July 19, 1962).)

603

ADDITIONAL REGULATION No. 1 TO THE GENERAL REGULATIONS FOR GENERATION AND SALE OF POWER IN ACCORDANCE WITH THE BOULDER CANYON PROJECT ADJUSTMENT ACT

In accordance with the terms and conditions of the act of July 19, 1940 (54 Stat. 774), and article 27 of the General Regulations promulgated May 20, 1941, the following additional Regulation No. 1 is hereby promulgated:

"Commencing with June 1, 1987, charges for electrical energy in addition to such other components as may then be authorized or required under the then existing laws and regulations, and to the extent not inconsistent therewith, shall include a component to return to the United States funds adequate to reimburse the Upper Colorado River Basin Fund for moneys expended from such fund on account of allowances for Hoover diminution during the filling period of the storage project reservoirs authorized by the Act of April 11, 1956 (70 Stat. 105), in accordance with paragraph 5 of the General Principles to Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead during the Lake Powell Filling Period, approved April 2, 1962. Such component shall be sufficient, but not more than sufficient, to provide said reimbursement in equal annual installments over a period of years equal to the number of years over which costs on account of allowance were incurred by the said Upper Colorado River Basin Fund."

(Adopted by Secretary of the Interior Stewart L. Udall on July 12, 1962. Published in Federal Register, 27 F.R. 6850 (July 19, 1962).)

APPENDIX VII - OPERATING CRITERIA

701 - Secretary's Operating Criteria - June 8, 1970

702 - Commissioner of Reclamation's explanation - June 9, 1970

701

United States Department of the Interior
BUREAU OF RECLAMATION
WASHINGTON, D.C. 20240

JUN 8 - 1970

Dear Governor Hathaway:

Enclosed is a copy of the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs" which I have adopted and which is being published in the Federal Register in accordance with Section 602 of the Colorado River Basin Project Act of September 30, 1968, Public Law 90-537 (82 Stat. 885).

The adopted criteria represent largely the contributions of a task group of State and Federal representatives which held five meetings from July through November 1969. The valuable input of information furnished by your representatives and our various contractors for water and power is appreciated.

Comments from the Upper and Lower Division States concerning the proposed operating criteria enclosed with my letter dated December 16, 1969, also have been helpful in preparing the adopted criteria. A detailed explanation of decisions on each of the suggestions and recommendations is being furnished to your representatives and others who participated in the various task force meetings.

In that letter you were advised that we expected to make a decision prior to July 1, 1970, regarding the proposed termination of the "General Principles to Govern, and Operating Criteria for, Glen Canyon Reservoir (Lake Powell) and Lake Mead During the Lake Powell Filling Period."

The avenue available to me for such a termination is provided in the option of Principle No. 2 of the Filling Criteria, which reads:

> ". . . If, in the judgment of the Secretary, the contents of Lake Powell and Lake Mead warrant such action, and after consultation with appropriate interests of the Upper Colorado River Basin and the Lower Colorado River Basin, the Secretary may declare that in not less than 1 year from and after the date of such declaration these principles and criteria are no longer applicable."

All of the comments submitted which relate to my exercise of this option have been carefully reviewed, and in my judgment the contents of Lake Powell and Lake Mead do not warrant termination of the Filling Criteria at this time.

The major objection expressed by Upper Basin interests to continuing the Filling Criteria has been the use of Colorado River Storage Project (CRSP) generated energy to replace Hoover deficiencies and the resultant impact upon the Upper Colorado River Basin Fund. Under current water and power marketing conditions, all CRSP generation is required to meet firm energy obligation of the United States and all energy needed to satisfy Hoover deficiencies must be purchased. Except for minor variations, the operating condition is expected to continue.

The net result is that increased revenues will accrue to the Upper Colorado River Basin Fund from power sales, and money expended from that fund to replace Hoover deficiencies will be reimbursed from the Colorado River Development Fund pursuant to Section 502, Public Law 90-537.

In accordance with the provisions of the Filling Criteria, the modification thereof dated May 11, 1964, and consistent with said Section 502, the Upper Colorado River Basin Fund will not be reimbursed for costs incurred in connection with impairment of capacity and energy resulting from the drawdown of Lake Mead below elevation 1,123 feet incident to the attainment of minimum power pool in Lake Powell. Neither will there be reimbursement for energy furnished from CRSP generation utilized in meeting energy deficiencies and impairments in Hoover generation.

I know of your vital interest in these matters. The efforts of you and your representatives have assisted us in making decisions which we believe are in the best interest of the entire Colorado River Basin.

Sincerely yours,

(Sgd) WALTER J. HICKEL

Secretary of the Interior

Hon. Stanley K. Hathaway
Governor of Wyoming
Cheyenne, Wyoming 82001

Enclosure

CRITERIA FOR COORDINATED LONG-RANGE OPERATION OF COLORADO RIVER RESERVOIRS PURSUANT TO THE COLORADO RIVER BASIN PROJECT ACT OF SEPTEMBER 30, 1968 (P. L. 90-537)

These Operating Criteria are promulgated in compliance with Section 602 of Public Law 90-537. They are to control the coordinated long-range operation of the storage reservoirs in the Colorado River Basin constructed under the authority of the Colorado River Storage Project Act (hereinafter "Upper Basin Storage Reservoirs") and the Boulder Canyon Project Act (Lake Mead). The Operating Criteria will be administered consistent with applicable Federal laws, the Mexican Water Treaty, interstate compacts, and decrees relating to the use of the waters of the Colorado River.

The Secretary of the Interior (hereinafter the "Secretary") may modify the Operating Criteria from time to time in accordance with Section 602(b) of P. L. 90-537. The Secretary will sponsor a formal review of the Operating Criteria at least every 5 years, with participation by State representatives as each Governor may designate and such other parties and agencies as the Secretary may deem appropriate.

I. ANNUAL REPORT

(1) On January 1, 1972, and on January 1 of each year thereafter, the Secretary shall transmit to the Congress and to the Governors of the Colorado River Basin States a report describing the actual operation under the adopted criteria for the preceding compact water year and the projected plan of operation for the current year.

(2) The plan of operation shall include such detailed rules and quantities as may be necessary and consistent with the criteria contained herein, and shall reflect appropriate consideration of the uses of the reservoirs for all purposes, including flood control, river regulation, beneficial consumptive uses, power production, water quality control, recreation, enhancement of fish and wildlife, and other environmental factors. The projected plan of operation may be revised to reflect the current hydrologic conditions, and the Congress and the Governors of the Colorado River Basin States shall be advised of any changes by June of each year.

II. OPERATION OF UPPER BASIN RESERVOIRS

(1) The annual plan of operation shall include a determination by the Secretary of the quantity of water considered necessary as of September 30 of that year to be in storage as required by Section 602(a) of P.L. 90-537 (hereinafter "602(a) Storage"). The quantity of 602(a) Storage shall be determined by the Secretary after consideration of 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 not be impaired because of failure to store sufficient water to assure deliveries under Section 602(a)(1) and (2) of P. L. 90-537.

(2) If in the plan of operation, either:

(a) the Upper Basin Storage Reservoirs active storage forecast for September 30 of the current year is less than the quantity of 602(a) Storage determined by the Secretary under Article II(1) hereof, for that date; or
(b) the Lake Powell active storage forecast for that date is less than the Lake Mead active storage forecast for that date:

the objective shall be to maintain a minimum release of water from Lake Powell of 8.23 million acre-feet for that year. However, for the years ending September 30, 1971 and 1972, the release may be greater than 8.23 million acre-feet if necessary to deliver 75,000,000 acre-feet at Lee Ferry for the 10-year period ending September 30, 1972.

(3) If, in the plan of operation, the Upper Basin Storage Reservoirs active storage forecast for September 30 of the current water year is greater than the quantity of 602(a) Storage determination for that date, water shall be released annually from Lake Powell at a rate greater than 8.23 million acre-feet per year to the extent necessary to accomplish any or all of the following objectives:

(a) to the extent it can be reasonably applied in the States of the Lower Division to the uses specified in Article III(e) of the Colorado River Compact, but no such releases shall be made when the active storage in Lake Powell is less than the active storage in Lake Mead,
(b) to maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell, and
(c) to avoid anticipated spills from Lake Powell.

(4) In the application of Article II(3)(b) herein, the annual release will be made to the extent that it can be passed through Glen Canyon Powerplant when operated at the available capability of the powerplant. Any water thus retained in Lake Powell to avoid bypass of water at the Glen Canyon Powerplant will be released through the Glen Canyon Powerplant as soon as practicable to equalize the active storage in Lake Powell and Lake Mead.

(5) Releases from Lake Powell pursuant to these criteria shall not prejudice the position of either the upper or lower basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact.

III. OPERATION OF LAKE MEAD

(1) Water released from Lake Powell, plus the tributary inflows between Lake Powell and Lake Mead, shall be regulated in Lake Mead and either pumped from Lake Mead or released to the Colorado River to meet requirements as follows:

(a) Mexican Treaty obligations;
(b) Reasonable consumptive use requirements of mainstream users in the Lower Basin;
(c) Net river losses;
(d) Net reservoir losses;
(e) Regulatory wastes.

(2) Until such time as mainstream water is delivered by means of the Central Arizona Project, the consumptive use requirements of Article III(1)(b) of these Operating Criteria will be met.

(3) After commencement of delivery of mainstream water by means of the Central Arizona Project, the consumptive use requirements of Article III(1)(b) of these Operating Criteria will be met to the following extent:

(a) *Normal*: The annual pumping and release from Lake Mead will be sufficient to satisfy 7,500,000 acre-feet of annual consumptive use in accordance with the decree in *Arizona* v. *California*, 376 U.S. 340 (1964).
(b) *Surplus*: The Secretary shall determine from time to time when water in quantities greater than "Normal" is available for either pumping or release from Lake Mead pursuant to Article II(b) (2) of the decree in *Arizona* v. *California* after consideration of all relevant factors, including, but not limited to, the following:

(i) the requirements stated in Article III(1) of these Operating Criteria;
(ii) requests for water by holders of water delivery contracts with the United States, and of other rights recognized in the decree in *Arizona* v. *California*;
(iii) actual and forecast quantities of active storage in Lake Mead and the Upper Basin Storage Reservoirs; and
(iv) estimated net inflow to Lake Mead.

(c) *Storage*: The Secretary shall determine from time to time when insufficient mainstream water is available to satisfy annual consumptive use requirements of 7,500,000 acre-feet after consideration of all relevant factors, including, but not limited to, the following:

(i) the requirements stated in Article III(1) of these Operating Criteria;
(ii) actual and forecast quantities of active storage in Lake Mead;
(iii) estimate of net inflow to Lake Mead for the current year;
(iv) historic streamflows, including the most critical period of record;
(v) priorities set forth in Article II(A) of the decree in *Arizona* v. *California*; and
(vi) the purposes stated in Article I(2) of these Operating Criteria.

The shortage provisions of Article II(B)(3) of the decree in *Arizona* v. *California* shall thereupon become effective and consumptive uses from the mainstream shall be restricted to the extent determined by the Secretary to be required by Section 301(b) of Public Law 90-537.

IV. DEFINITIONS

(1) In addition to the definitions in Section 606 of P. L. 90-537, the following shall also apply:

(a) "Spills," as used in Article II(3)(c) herein, means water released from Lake Powell which cannot be utilized for project purposes, including, but not limited to, the generation of power and energy.
(b) "Surplus," as used in Article III(3)(b) herein, is water which can be used to meet consumptive use demands in the three Lower Division States in excess of 7,500,000 acre-feet annually. The term "surplus" as used in these Operating Criteria is not to be construed as applied to, being interpretive of, or in any manner having reference to the term "surplus" in the Colorado River Compact.
(c) "Net inflow to Lake Mead," as used in Article III(3) (b)(iv) and (c)(iii) herein, represents the annual inflow to Lake Mead in excess of losses from Lake Mead.
(d) "Available capability," as used in Article II(4) herein, means that portion of the total capacity of the powerplant that is physically available for generation.

United States Department of the Interior
BUREAU OF RECLAMATION
WASHINGTON, D.C. 20240

IN REPLY
REFER TO: 430

JUN 9 1970

Mr. Roy Peck
Executive Director
Wyoming State Department of Economic
Planning and Development
210 West 23rdStreet
Cheyenne, Wyoming 82001

Dear Mr. Peck:

Enclosed is a copy of a self-explanatory letter by which the Secretary transmitted the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs" to the Governors of the seven Colorado River Basin States.

Also enclosed is a detailed explanation of the decisions reached and the actions taken on the collective comments made by the Governors of the Upper and Lower Division States of the Colorado River Basin. The series of five major task force meetings and the many subtask group meetings extending from July 25 to November 24, 1969, played a large part in shaping the background for the proposed operating criteria which were sent to the Governors by Secretary Hickel's letter of December 16, 1969. This same background and the comments of the Governors of the Upper and Lower Basin States contributed greatly to guiding the recommendations to the Secretary on the criteria now being published in the *Federal Register*.

Your participation in those deliberations is appreciated, and I take this means of expressing a personal "thank you."

Sincerely,

ELLIS L. ARMSTRONG

Ellis L. Armstrong
Commissioner

Enclosure

Solicitor
Assoc. Sol. - Reclamation & Power

cc: Chief Engineer, Denver, Colorado
Regional Solicitor, Los Angeles, Calif.
Regional Solicitor, Salt Lake City, Utah
Regional Director, Boulder City, Nevada
Regional Director, Salt Lake City, Utah
Asst. Reg. Dir., Phoenix, Ariz.

DEPARTMENTAL ACTIONS ON COMMENTS FROM UPPER AND LOWER DIVISION STATES ON PROPOSED CRITERIA FOR COORDINATED LONG-RANGE OPERATION OF COLORADO RIVER RESERVOIRS PURSUANT TO THE COLORADO RIVER BASIN PROJECT ACT OF SEPTEMBER 30, 1968 (P.L. 90-537)

The title of the Operating Criteria has been modified slightly from "Coordinated Long-Range Operating Criteria for Colorado River Reservoirs . . ." to "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs. . ." to accord with the provisions of Section 602(a) of P.L. 90-537.

The second sentence of the first paragraph of the Operating Criteria has been revised in accordance with the Lower Division proposal that the word "Upper" be deleted from the phrase that the Operating Criteria are to control the "operation of the storage reservoirs in the [Upper][1] Colorado River Basin . . ." since the reservoirs referred to are in both the Upper and Lower Basins. In the last sentence of the first paragraph, a Lower Division suggestion was adopted that "consistent" be inserted in lieu of "consonant". In this same sentence an Upper Division proposal was adopted that "contracts" be deleted. These changes are reflected as follows:

> "The Operating Criteria will be administered [consonant] *consistent* with applicable Federal laws, [contracts,] the Mexican Water Treaty, interstate compacts, and decrees relating to the use of the waters of the Colorado River."

While "contracts" are pertinent in the context of the sentence, the deletion of the word makes this sentence consistent with the provisions of Sections 601(c) and 602(a) of the Colorado Basin Project Act in which the word "contracts" is not included. In this connection, the Upper Basin proposal to refer to the several Compacts, the Mexican Water Treaty and court decrees as constituting "the law of the river" was not adopted since the phrase "the law of the river" cannot be said to exclude "contracts". The Upper Division also proposed that the import of Sub-article II(1)(f) be incorporated in the preamble to the Operating Criteria "in order to express the indispensable reason" for the criteria. This refers to the necessity to assure that upper basin consumptive uses not be impaired because of failure to store sufficient water to assure deliveries under Section 602(a)(1) and (2) of P.L. 90-537. This proposal was not adopted because this provision is more appropriately retained in its present position as one of the factors to be considered by the Secretary in determining the quantity of Section 602(a) storage.

The Upper Division proposal with regard to the second paragraph of the Operating Criteria was adopted because it is consistent with Section 602(b) of P.L. 90-537. This revises the provision that the Secretary "reserves the right to modify the Operating Criteria" to provide that the Secretary "may" modify the Operating Criteria. The Upper Division proposed addition that the formal review will include "participation by State representatives as each Governor may designate" was added since this is also provided for in Section 602(b). However, the word "once" was deleted from the phrase "that the review would be made at least [once] every five years" as being unnecessary. The statement that the participation in the review would include "such other parties and agencies as the Secretary may deem appropriate" was retained since this participation is provided for in Section 602(b) with regard to the initial review of the proposed criteria and these same parties should participate in the formal review thereafter.

To be consistent with the format of the balance of the Operating criteria, the second paragraph of Article I, which previously was unnumbered, has been designated Subarticle I(2). In Subarticle I(1), which concerns the Secretary's annual report of actual operation for the "preceding compact water year and the projected operation for the current year", the Lower Division proposal that the reference to "current year" be changed

[1]Words in [brackets] are deleted and words *italicized* are added.

to "current *calendar* year" was not adopted because the existing language comports with the exact language of Section 602(b) of P.L. 90-537. In the last sentence of Subarticle I(2) the reference to "projected plans of operation" has been revised to "projected plan" as suggested by both Divisions. Upper Division proposals in Subarticle I(2) were adopted that the reerence to "water quality" as one of the uses of the reservoirs to which appropriate consideration shall be given be revised to "water quality control" and the phrase that the projected plan of operation "shall be revised as necessary" was changed to "may be revised". Also, the phrase in the last sentence of Subarticle I(2) that the "Governors of the Colorado River Basin States advised of any changes. . ." was changed to "Governors of the Colorado River Basin States *shall be* advised of any changes. . ." so that it now reads:

> "The projected plan of operation may be revised to reflect the current hydrologic conditions, and the Congress and the Governors of the Colorado River Basin States shall be advised of any changes by June of each year."

The Upper Basin proposal that a reference to "the primary objectives of Section 602(a) of P.L. 90-537" be inserted in the first sentence of Subarticle I(2) has been rejected because it would then be incumbent to explain what are considered "primary objectives" as opposed to "secondary objectives" and it is unnecessary to become involved in these concepts at this time. An Upper Division proposal was rejected that "designated representatives" of the Governors be included in the parties to be advised of changes in the projected plan of operation because this is not a statutory requirement with regard to the plan of operation although it is a requirement of Section 602(b) that there be consultation regarding modification of the criteria.

In the first sentence of Subarticle II(1), designated "Operation of Upper Basin Reservoirs", a Lower Division proposal was adopted in order to be consistent with the language of Section 602(a) of P.L. 90-537 and, in accordance therewith, the reference to the Secretary's determination of the quantity of water considered necessary as of September 30 to be in storage "after consideration of and compliance with the provisions" of Section 602(a) was revised to delete the above-quoted portion and to substitute therefor "as required by". In Subarticle II(1)(d), one of the factors to be considered in the Secretary's determination of the quantity of 602(a) storage of Lower Division proposal would have provided:

> "Estimated future depletions in the Upper Basin, [including] assuming recurrence of critical periods of water supply;. . ."

However, this was rejected although a change was made by inserting "the effects of" between "including" and "recurrence" so that Subarticle II(1)(d) now reads:

> "Estimated future depletions in the Upper Basin, including the effects of recurrence of critical periods of water supply;. . ."

In Subarticle II(1)(e) which included a reference to the "Report of the Committee on Probabilities and Test Studies" as another of the factors to be considered by the Secretary in determining the quantity of Section 602(a) storage, the Upper Division proposed to limit the effect of the report "to the extent it is applicable to the 98.4 + % rule curve developed therein". This was rejected because such a reference is unnecessarily restrictive and because the entire report and not only a portion thereof should be considered at this time. The Upper Division also advocated the immediate application of the 98.4 + % rule curve to determine the amount of storage needed in the Upper Basin reservoirs to meet the requirements of Section 602(a) of P.L. 90-537. Test operation studies referred to in Subarticle II(1)(e) of the Operating Criteria show that factors other than a rule curve will, for many years, govern the storage of water in the Upper Basin reservoirs. Hence, a rule curve is not now included in the Operating Criteria. Experience gained under the Operating Criteria will assist in formulating an appropriate rule curve. Also, an Upper Division proposal to substitute

consideration of "future" instead of "additional" studies as the Secretary deems necessary as a part of the provision in Subarticle II(1)(e) dealing with the aforementioned Report of the Committee on Probabilities and Test Studies was rejected since it would add no new meaning thereto.

A Lower Division proposal to modify Subarticle II(1)(f) which had the effect of de-emphasizing the provision that Upper Basin consumptive uses not be impaired because of failure to store sufficient water to assure deliveries under Section 602(a)(1) and (2) of P.L. 90-537, was rejected since it added nothing of substance. As indicated heretofore, Subarticle II(1)(f) is retained in its present position and the Upper Division proposal that it be removed and made a part of the preamble to the Operating Criteria was not adopted.

A Lower Division proposal was rejected that a new Subarticle II(1)(g) be included which would provide that one of the factors to be considered by the Secretary in determining the quantity of 602(a) storage would be:

> "The maximum production of firm power and energy in conformity with Section 7 of P.L. 84-485 and consistent with Section 602(c) of P.L. 90-537 and these Operating Criteria."

The reasons for not adopting this proposal are that the provision was proposed for inclusion in the Subarticle entitled "Operation of Upper Basin Reservoirs" whereas, in order to be relevant, the provision should apply to both Upper and Lower Basin reservoirs. Moreover, "power production" is already included in Subarticle I(2), which is applicable to both Basins, as one of the uses of the reservoirs to which the Secretary will be given appropriate consideration. Finally, the proposal appears unnecessary in that the Operating Criteria must be administered consistent with applicable Federal laws as is stated in the first paragraph of the Operating Criteria.

A portion of an Upper Division proposal for the introductory paragraph of Subarticle II(2) was adopted, but is more appropriately inserted as a new Subarticle II(5) and reads as follows:

> "Releases from Lake Powell pursuant to these criteria shall not prejudice the position of either the Upper or Lower Basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact."

The Upper Division concept that the releases described in Subarticle II(2) are "interim" was not adopted because, in a broad sense, the entire long-range Operating Criteria are "interim" pending augmentation of the waters of the Colorado River. When the flows of the Colorado River are augmented, as contemplated in Section 602 of P.L. 90-537, the Operating Criteria will be revised.

Revised punctuation in Subarticle II(2) clarifies those provisions. An Upper Division proposal was rejected that the concluding paragraph of Subarticle II(2) be revised to reduce the figure of 8.23 million acre-feet to 8 million acre-feet or less, because no valid reason has been advanced for making such a change and because the figure of 8.23 million acre-feet has been utilized consistent both in Congressional testimony and in basic studies. Furthermore, adoption of the new Subarticle II(5), as quoted above, provides the necessary protection to both Basins. For the same reasons, the figure of 8.23 million acre-feet was not changed to 8 million acre-feet in Subarticle II(3) as was proposed by the Upper Division. In this connection, the Operating Criteria imposes no firm or fixed obligation that 8.23 million acre-feet be released each year from Lake Powell. That quantity is stated as an "objective" of the Operating Criteria.

In Subarticle II(4) two Lower Division proposals have not been adopted that "will" in lines 2 and 6 be changed to "shall" and that "in subsequent years" be replaced by "as expeditiously as possible" in referring to the subsequent release of water retained in Lake Powell to avoid bypass of water at the powerplant. However, the phrase "in subsequent years" has been replaced by "as soon as practicable".

The Lower Division suggested that Subarticle II(3), which, as proposed, provided "After commencement of delivery of mainstream water by means of the Central Arizona Project, . . ." be revised to read: "After commencement of delivery of mainstream water *into central Arizona* by means of the Central Arizona Project, . . ." since "into central Arizona" previously appears in Subarticle III(2). This suggestion was not adopted but, in lieu thereof, the phrase "into central Arizona" was deleted from Subarticle III(2) as unnecessary. The word "will" was not changed to "shall" in Subarticle III(2) as was suggested by the Lower Division.

In Subarticle III(3)(a) the statutory citation has been added to the reference to *"Arizona* v. *California"* for clarity.

In Subarticle III(3)(b) the Lower Division proposal that the reference to "Normal" be followed by "as defined above" in Subarticle III(3)(a) was not considered necessary. However, a Lower Division proposal was adopted that the reference to "factors" in Subarticle III(3)(b)(i) and in Subarticle III(3)(c)(i) be changed to "requirements" in order to be consistent with Subarticle III(1) which is the reference point and since "requirements" is the term used therein. The Lower Division proposal that Subarticle III(3)(c)(iv), which refers to "historic stream flows, including the most critical period of record;" be expanded by the addition of "and its probability of occurrence" as not adopted because the suggested addition was considered redundant. However, the Lower Division proposed Article III(3)(c)(v) was adopted and reads:

"(v) Priorities set forth in Article II(A) of the Decree in *Arizona* v. *California*; and"

The Lower Division proposal that former Subarticle III(3)(c)(v), redesignated as Subarticle III(3)(c)(vi), which referred to "water quality factors, environmental conditions, and usefulness of Lake Mead for recreational and fishery purposes.", be revised as follows was adopted, except that the word "purposes" was substituted for "factors":

"(vi) The [factors] *purposes* stated in Article I(1) of these Operating Criteria."

In Subarticle IV(1)(b) the Upper Division proposal was adopted that the definition of "surplus" be expanded by a statement that the term "surplus" as used in these criteria is not to be construed as applying to, being interpretive of, or in any manner having reference to the term "surplus" in The Colorado River Compact. However, the reference therein to "these criteria" was changed to "these Operating Criteria".

In Subarticle IV(1)(c) the definition of " 'Net inflow to Lake Mead' as used in Subarticle III(3)(b)(iv) herein. . ." has been expanded to include as omitted reference to "and (c)(iii)" following the reference to "Article III(c)(b)(iv)."

The Lower Division proposal for a new Article IV(1)(d) definition of "Available capability" was adopted except that the phrase "at any time" was deleted therefrom so that it provides:

"(d) 'Available capability', as used in Article II(4) herein, means that portion of the total capacity of the powerplant that is physically available [at any time] for generation."

Finally, the Lower Division definition of "Release from Lake Mead" which was designed to encompass "water either pumped from Lake Mead or delivered to the Colorado River below Lake Mead" was not adopted because the relevant statements in Article III concerning water either pumped from Lake Mead or released from Lake Mead are well understood and adequately covered the factual situation.

APPENDIX VIII - ARIZONA v. CALIFORNIA

801 - Special Master's Analysis of Compact

802 - Special Master's Decree Recommended to Supreme Court

PARTIAL DOCUMENT
Special Master's Analysis of Compact

I therefore conclude that the provisions of the Compact, unless made operative by relevant statutes or contracts, do not control the disposition of this case. Nevertheless, in view of the urgent arguments of the sovereign parties and against the eventuality that the Court may take a different view of the matter, I set forth my views regarding the meaning of some provisions of the Compact.

The limits established by the Compact on the acquisition of appropriative rights are applicable to the mainstream of the Colorado River and to its tributaries. Arizona has contended otherwise, claiming that the Compact relates to the mainstream exclusively. To support this contention, Arizona advances a number of arguments:

1. That the events leading to the adoption of the Compact, already mentioned in this Report, reveal an intention to deal with mainstream problems rather than with problems on the tributaries;
2. That the Upper Basin could physically control and acquire rights, against the Lower Basin, in mainstream and Upper Basin tributary water only, and hence was not interested in Lower Basin tributaries;
3. That the Compact purports to apportion only part and not all of the water in the River System;
4. That the obligation specified in Article III(d) necessarily refers to mainstream water only;
5. That subdivisions (a) and (d) of Article III are correlative and that III(b) refers to additional mainstream water;
6. That Article VIII deals with mainstream water.

At best, these arguments suggest two things: (1) that some provisions of the Compact relate to mainstream water exclusively, and (2) that the Compact might have been limited to the mainstream in all of its provisions if the negotiators had chosen to have it so confined. However, the plain words of the Compact permit only one interpretation —that Article III(a), (b), (c), (f) and (g) deal with both the mainstream and the tributaries. Article II(a) states: "The term 'Colorado River System' means that portion of the Colorado river and its tributaries within the United States of America." Article III(a) apportions "from the Colorado River System . . . the exclusive beneficial consumptive use . . . of water." Article III(b) allows the Lower Basin "to increase its beneficial consumptive use of *such waters*. . . ." "Such waters" can only refer to System waters, that is, to mainstream and tributary water as defined in Article II(a). In Article III(c), (f) and (g) System water is specified by name.

The various arguments of Arizona fail before this unmistakable language of the Compact. The historical fact that the Upper Basin was primarily concerned with the mainstream will not nullify language of the Compact that subjugates both mainstream and tributaries to its rule. Nor is the argument persuasive that because some provisions deal only with the mainstream, all provisions are so limited. It is certainly true that the second sentence of Article VIII deals with the mainstream only. It very clearly says so. The preceding and the following sentences, however, speak of the Colorado River System, indicating the draftsmen's intent to distinguish the two terms.

Article I states that "an apportionment of the use of part of the water of the Colorado River System is made" by the Compact, and Article VI speaks of "waters of the Colorado River System not covered by the terms of this Compact". From this Arizona would have me infer that tributaries are not subject to the limitations of Article III(a) and (b). The provisions of Articles I and VI can be given full effect without thus overriding the plain language of Article II(a). Article I is consistent with Article III(f) and (g) which provides for further equitable apportionment of the use of System water. The 1922 Compact apportioned the use of 16,000,000 acre-feet of water to the two Basins; a later compact could make a "further equitable apportionment" of remaining System water. Article VI demonstrates that the Compact governs inter-basin and not interstate relations. If a controversy should arise, for example, between two Lower Basin states over the mainstream, or over a tributary, that Article provides for alternative modes of adjusting the dispute. As

between Lower Basin states "the waters of the Colorado River System [are] not covered by the terms" of the Compact. (Colorado River Compact, Art. VI(a); see Ariz. Exs. 46, 49.)

Lastly, Arizona argues that Article III(a) relates to the mainstream only because III(a) and III(d) are correlative, III(d) being III(a) multiplied by ten, and Article III(d) is clearly a mainstream measurement. This argument is unacceptable. Since Article III(a) imposes a limit upon appropriation whereas III(d) deals with supply at Lee Ferry, an interpretation which makes these two provisions correlative one to another is inadmissible. Since a substantial quantity of water is lost through reservoir evaporation and channel losses as it flows from Lee Ferry, the point where the III(d) obligation is measured, to the diversion points downstream from Hoover Dam, where most of the appropriations are made, 7,500,000 acre-feet of water at Lee Ferry will supply a considerably smaller amount of appropriations below Hoover Dam. Moreover, III(a) extends to appropriations on Lower Basin tributaries as well as the mainstream. Such appropriations cannot possibly have any relation to the quantitative measurement of the flow of water at Lee Ferry.

The Compact does affect the supply of water available to the Lower Basin. Two provisions of the Compact relate to supply, Article III(c) and Article III(d). Article III(d) presents no questions of interpretation. Under it, the Upper Division states may "not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years, reckoned in progressive series beginning with the first day of October...."

With the storage provided by Lake Mead, and barring a drought unprecedented in the recorded history of the River, the Lower Basin has, under the guarantee of the Compact, available for use at Hoover Dam a minimum of 7,500,000 acre-feet of water per year, less transit losses between Lee Ferry and the dam, evaporation loss from Lake Mead, and its share of the Mexican treaty obligation.

The Compact provides for the delivery of water by the states of the Upper Division at Lee Ferry, in addition to the supply guaranteed by III(d), when the obligation to Mexico cannot be satisfied "from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b) [of Article III of the Compact]. . . ." In that event, "the burden of such deficiency shall be equally borne by the upper basin and the lower basin, and whenever necessary the states of the upper division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d)" of Article III. At the time the Compact was signed (1922) and when it became effective (1929), the United States was under no treaty obligation to Mexico and the Compact created no obligation. However, in 1944 the United States and Mexico negotiated a treaty, proclaimed in 1945, under which the United States has the duty to deliver 1,500,000 acre-feet annually to the United States of Mexico at the international boundary.[13]

Several questions arise regarding the effect of Article III(c), and the parties have offered various suggestions regarding its interpretation. These questions include: (1) what is the meaning of the word "surplus"? (2) if surplus is not sufficient to supply Mexico, how should the Upper Basin's further delivery obligation be measured under the language of Article III(c)? In my judgment, the various questions advanced by the parties concerning construction of this subdivision ought not to be answered in the absence of the states of the Upper Basin; nor need they be answered in order to dispose of this litigation affecting only Lower Basin interests. Under the interpretation which I propose of the Boulder Canyon Project Act and the water delivery contracts made by the Secretary of the Interior pursuant thereto, it is unnecessary to predict the supply of water in the mainstream, in the Lower Basin, in order to adjudicate the present controversy.[14]

Arizona argues that Article III(b), relating exclusively to appropriations in the Lower Basin, imposes an additional delivery burden on the Upper Basin. She reasons that after the III(a) apportionment is exhausted, the Lower Basin may, under Article III(b), increase its uses by 1,000,000 acre-feet and that the Upper Basin is obliged to furnish water for this increased III(b) use, subject only to the Upper Basin's first right to 7,500,000 acre-feet of water under Article III(a).

[13]This obligation is subject to several qualifications; the treaty is discussed *infra* at pages 295-296.

[14]Stream flow at Lee Ferry has historically exceeded the maximum delivery obligation under III(c) and III(d). Whether this condition will continue upon full development of the Upper Basin is a subject of dispute among the experts which need not be resolved here.

Historic stream flows at Lee Ferry were as follows:

TEN-YEAR TOTALS OF COLORADO RIVER WATER AT LEE FERRY (In Acre-Feet)

Ten-Year Period	Stream Flow in Acre-Feet	Ten-Year Period	Stream Flow in Acre-Feet
1896-1905	133,700,000	1923-1932	139,969,500
1897-1906	141,904,000	1924-1933	133,453,600
1898-1907	146,407,000	1925-1934	125,368,900
1899-1908	144,870,000	1926-1935	123,939,900
1900-1909	151,326,000	1927-1936	121,901,700
1901-1910	151,695,000	1928-1937	117,211,700
1902-1911	153,417,000	1929-1938	117,328,400
1903-1912	163,557,000	1930-1939	107,498,700
1904-1913	162,601,000	1931-1940	101,510,200
1905-1914	167,235,800	1932-1941	111,174,700
1906-1915	164,736,200	1933-1942	112,917,800
1907-1916	164,097,000	1934-1943	114,435,400
1908-1917	163,987,100	1935-1944	123,260,400
1909-1918	165,873,700	1936-1945	124,893,700
1910-1919	155,026,100	1937-1946	121,668,100
1911-1920	161,795,800	1938-1947	123,285,600
1912-1921	167,888,600	1939-1948	121,532,800
1913-1922	165,311,000	1940-1949	126,498,100
1914-1923	168,578,300	1941-1950	130,473,700
1915-1924	161,724,600	1942-1951	124,252,400
1916-1925	160,565,300	1943-1952	125,203,000
1917-1926	157,249,000	1944-1953	122,745,000
1918-1927	151,942,800	1945-1954	115,639,600
1919-1928	153,616,500	1946-1955	111,401,200
1920-1929	161,981,500	1947-1956	111,410,500
1921-1930	155,312,900	1948-1957	115,243,100
1922-1931	140,985,600	1949-1958	116,555,900

Article III(b) cannot be stretched so far. Whatever may account for its segregation as a separate provision of the Compact, there is nothing to suggest that III(b) imposes an affirmative duty on the Upper Basin. Rather, it imposes for the benefit of the Upper Basin, a ceiling on Lower Basin appropriations, albeit that the Lower Basin is privileged to have a higher ceiling than the Upper Basin.

It is my conclusion that Article III(b) has the same effect as Article III(a), and this conclusion is supported by the reports of the Compact commissioners, who spoke of III(a) and III(b) as apportioning 7,500,000 acre-feet to the Upper Basin and 8,500,000 acre-feet to the Lower Basin. (See Ariz. Exs. 46, 49, 53, 55, 57).

"Beneficial consumptive use" is a term used throughout the Compact although, regrettably, it is not defined in Article II or elsewhere in the document. In the early stages of the hearing, Arizona spent a vast amount of effort in seeking to establish the term as a word of art. She now contends that it has no special meaning and never did.

California argues that the term is used in the Compact as a word of art and means:

> "the loss of Colorado River System water in processes useful to man by evaporation, transpiration or diversion out of the drainage basin, or otherwise, whereby such water becomes unavailable for use within the natural drainage basin in the United States, or unavailable for delivery to Mexico in satisfaction of requirements imposed by the Mexican Treaty. The term includes but is not limited to incidental consumption of water such as evaporation and transpiration from water surfaces and banks of irrigation and drainage canals, and on or along seeped areas, when such incidental consumption is associated with beneficial consumptive use of water, even though such incidental consumption is not, in itself, useful."[15]

[15]Calif. Brief, Vol. II, p. A1-4.

Further refinements of this definition are contained in a 70-page brief, labeled Appendix 1 of California's Opening Brief. Other parties have contributed suggestions for construing the term.

As used in the Compact, beneficial consumptive use was intended to provide a standard for measuring the amount of water each Basin might appropriate. This was necessary since Article III(a) and (b) imposed limits on appropriative rights. In early applications of the western law of appropriation, diversions were regarded as the measure of water use.[16] By 1922, however, it was recognized that the amount of water diverted for irrigation purposes was not necessarily the amount consumed and lost to the stream. Some water applied to the ground would usually reappear in the stream as return flow. The term beneficial consumptive use as employed in the Compact was intended to give each Basin credit for return flow. Thus whether the limits fixed by Article III(a) and (b) have been reached or exceeded is to be determined by measuring the amount of each Basin's total appropriations through the formula, diversions less return flows. In the Compact, "beneficial consumptive use" means consumptive use (as opposed to non-consumptive use, *e.g.* water power) measured by the formula of diversions less return flows, for a beneficial (that is, non-wasteful) purpose. This understanding of the term is reflected in several of the commissioner's reports. (See Ariz. Exs. 46, 52, 54, 57.)[17]

As the foregoing discussion indicates, I regard Article III(a) and (b) as a limitation on appropriative rights and not as a source of supply. So far as the Compact is concerned, Lower Basin supply stems from Article III(c) and (d). There are, of course, other sources of supply, for example, Lower Basin tributary inflow, but these are not dealt with as supply items in the Compact. Thus when referring to the Compact, it is accurate to speak of III(c) and III(d) water, but it is inaccurate and indeed meaningless to speak of III(a) and III(b) water. For Compact purposes, Article III(a) and (b) can refer only to limits on appropriations, not to the supply of water itself.

It is true that Congress in Section 4(a) of the Project Act, treated Article III(a) as a source of supply rather than as a limitation on appropriations. The Act speaks of "the waters apportioned to the lower basin States by paragraph (a) of Article III of the Colorado River compact...." Later in this Report I shall develop at some length the meaning of this language and the confusion it has produced in this litigation. Suffice it now to say that the congressional meaning is different from the Compact meaning. One may properly speak of III(a) water in the Project Act sense, but not in the Compact sense. Much of the confusion in this case may be traced to this difference between the two writings, for the parties speak of III(a) water without differentiating between the Compact and the Project Act.

One other contention relating to the Compact may be noticed here. Under Section 4(a) of the Project Act, California, in addition to consuming a part of the so-called III(a) water, may share in "excess or surplus waters unapportioned by said Compact." California contends that III(b) uses are unapportioned by the Compact. The argument is based primarily on the fact that Article III(b) does not use the word "apportioned" which appears in Article III(a). Article III(b) gives the Lower Basin "the right to increase its beneficial consumptive use of" water by 1,000,000 acre-feet per annum. I have already indicated my view that subdivisions (a) and (b) of Article III operate in identical fashion; that the net effect of the two sections is to limit appropriations in the Upper Basin to 7,500,000 acre-feet and in the Lower Basin to 8,500,000 acre-feet. That both sections effect an apportionment is made clear by Article III(f), which provides for "further equitable apportionment of the beneficial uses of the waters of the Colorado River System unapportioned by paragraphs (a), (b) and (c)" of Article III. California argues that apportionment has no precise or consistent meaning in the Compact, since in the foregoing provision Article III(a) and (b) are lumped together with Article III(c) which, according to the argument, clearly does not apportion water to Mexico. California's argument has no merit. Article III(c), while apportioning no water to Mexico, does apportion the burden of a deficiency resulting from the Mexican obligation between the Upper and Lower Basins, and hence effects an apportionment. Moreover, as I have previously had occasion to observe, the reports of the Compact commissioners describe Article III(b) as an apportionment (See Ariz. Exs. 46, 49, 53, 55, 57).

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[16]See Hutchins, Selected Problems in the Law of Water Rights in the West 331 (1942).

[17]The term has since been adopted by branches of the engineering profession to express highly sophisticated formulae useful in the planning of irrigation projects. One such is the Blany-Criddle formula U=KF—R. For an explanation of this formula, see Tr. 13417—13428 (Criddle). Such meanings have no bearing on the term as used in the Compact.

By these observations I do not mean to rule on California's rights under Section 4(a) of the Project Act. That III(b) uses are apportioned for Compact purposes does not control the interpretation of the statute, and I shall discuss its interpretation in this regard later in the Report.

PART THREE

Recommended Decree

It is ORDERED, ADJUDGED AND DECREED that

I. For purposes of this decree:

(A) "Consumptive use" means diversions from the stream less such return flow thereto as is available for consumptive use in the United States or in satisfaction of the Mexican treaty obligation;

(B) "Mainstream" means Lake Mead and the mainstream of the Colorado River downstream from Lake Mead within the United States;

(C) Consumptive use from the mainstream within a state shall include all uses of water of the mainstream within that state, including but not limited to, uses made by persons, by agencies of the state, and by the United States for the benefit of Indian Reservations and other federal establishments within the state;

(D) "Regulatory structures controlled by the United States" refers to Hoover Dam, Davis Dam, Parker Dam, Headgate Rock Dam, Palo Verde Weir, Imperial Dam, Laguna Dam and all other dams and works controlled or operated by the United States which regulate the flow of water in the mainstream or the diversion of water from the mainstream;

(E) "Water controlled by the United States" refers to the water in Lake Mead, Lake Mohave, Lake Havasu and all other water in the mainstream below Hoover Dam and within the United States of America;

(F) "Tributaries" means all stream systems in the Lower Basin of the Colorado River the waters of which naturally drain into the main Colorado River and also means that portion of the main Colorado River in the Lower Basin above Lake Mead;

(G) "Perfected right" means a water right acquired in accordance with state law, which right has been exercised by the actual diversion of a specific quantity of water that has been applied to a defined area of land or to definite municipal or industrial works, and in addition shall include water rights created by the reservation of mainstream water for the use of federal establishments under federal law whether or not the water has been applied to beneficial use;

(H) "Present perfected rights" means perfected rights, as here defined, existing as of June 25, 1929, the effective date of the Boulder Canyon Project Act;

(I) "Domestic use" shall include the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but shall exclude the generation of electrical power;

(J) "Annual" and "Year," except where the context may otherwise require, refer to calendar years;

(K) Consumptive use of water diverted in one state for consumptive use in another statre shall be treated as if diverted in the state for whose benefit it is consumed.

II. The United States, its officers, attorneys, agents and employees, be, and they are hereby severally enjoined:

(A) From operating regulatory structures controlled by the United States and from releasing water controlled by the United States other than in accordance with the following order of priority:

(1) For river regulation, improvement of navigation, and flood control,

(2) For irrigation and domestic use, and

(3) For power;

Provided, however, that the United States may release water in satisfaction of its obligations to the United States of Mexico under the treaty dated February 3, 1944, without regard to the priorities specified above;

(B) From releasing water controlled by the United States for irrigation and domestic use in the States of Arizona, California and Nevada, except as follows:

(1) If sufficient mainstream water is available for release, as determined by the Secretary of the Interior, to satisfy 7,500,000 acre-feet of annual consumptive use in the aforesaid three states, then of such 7,500,000 acre-feet of consumptive use, there shall be apportioned 2,800,000 acre-feet for use in Arizona, 4,400,000 acre-feet for use in California, and 300,000 acre-feet for use in Nevada;

(2) If sufficient mainstream water is available for release, as determined by the Secretary of the Interior, to satisfy annual consumptive use in the aforesaid states in excess of 7,500,000 acre-feet, such excess consumptive use is surplus, and 50% thereof shall be apportioned for use in Arizona and 50% for use in California; provided, however, that if the United States so contracts with Nevada, then 46% of such surplus shall be apportioned for use in Arizona and 4% for use in Nevada;

(3) If insufficient mainstream water is available for release, as determined by the Secretary of the Interior, to satisfy annual consumptive use of 7,500,000 acre-feet in the aforesaid three states, then the available annual consumptive use shall be apportioned as follows:

(a) For use in Arizona $\frac{2.8}{7.5,}$

(b) For use in California $\frac{4.4}{7.5,}$

(c) For use in Nevada $\frac{.3}{7.5;}$

(4) Any mainstream water consumptively used within a state shall be charged to its apportionment, regardless of the purpose for which it was released;

(5) If the water apportioned for consumptive use in any of said states in any year is insufficient to satisfy present perfected rights in that state, the deficiency shall first be supplied out of water apportioned for use in the other two states but not consumed in those states, and any remaining deficiency shall be supplied by each of the remaining states, out of water apportioned for consumptive use in such states which is in excess of the quantity necessary to satisfy present perfected rights in such states, in proportion to the ratios heretofore established between them, to wit: if water must be supplied to satisfy present

perfected rights in two of the three states, then the third state shall, out of such excess, supply all the necessary water, and if water must be supplied to satisfy present perfected rights in one state, then each of the other two states shall out of such excess supply that proportion of the necessary water that its apportionment of the first 7,500,000 acre-feet of consumptive use bears to the aggregate apportionment of the two states;[1] provided, however, that present perfected rights in California shall not exceed 4,400,000 acre-feet of consumptive use per annum;

(6) If the mainstream water apportioned for consumptive use in any year is insufficient to satisfy present perfected rights in each and all of the three states, then such water shall be allocated for consumptive use in accordance with the priority of present perfected rights without regard to state lines; provided, however, that present perfected rights in California shall not exceed, 4,400,000 acre-feet of consumptive use per annum;

(7) Notwithstanding the provisions of Paragraphs (1) through (6) of this subdivision (B), mainstream water shall be delivered to users in Arizona, California and Nevada only if contracts have been made by the Secretary of the Interior, pursuant to Section 5 of the Boulder Canyon Project Act, for delivery of such water;

(8) If, in any one year, water apportioned for consumptive use in a state will not be consumed in that state, whether for the reason that delivery contracts for the full amount of the state's apportionment are not in effect or that users cannot apply all of such water to beneficial uses, or for any other reason, nothing in this decree shall be construed as prohibiting the Secretary of the Interior from releasing such apportioned but unused water during such year for consumptive use in the other states. No rights to the recurrent use of such water shall accrue by reason of the use thereof;

(C) From releasing water controlled by the United States for use in the States of Arizona, California and Nevada for:

(1) Any use or user in violation of state law, except as specified in Article II (B) (5) and (6) of this decree and except as federal statutes may otherwise specifically direct;

(2) The benefit of any federal establishment, except as specified hereinafter; provided, however, that such release may be made notwithstanding the provisions of Paragraph (7) of subdivision (B) of this Article and of Paragraph (1) of this subdivision (C) and provided further that nothing herein shall prohibit the United States from making future additional reservations of unappropriated mainstream water as may be authorized by law:

(a) The Chemehuevi Indian Reservation in annual quantities not to exceed (i) 11,340 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 1,900 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of February 2, 1907;

(b) The Cocopah Indian Reservation in annual quantities not to exceed (i) 2,744 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 431 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of September 27, 1917;

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[1]Thus if water is to be supplied from the other states' apportionment, Arizona shall contribute $\frac{2.8}{3.1}$ and Nevada $\frac{.3}{3.1}$ of the total amount supplied.

(c) The Yuma Indian Reservation in annual quantities not to exceed (i) 51,616 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 7,743 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of January 9, 1884;

(d) The Colorado River Indian Reservation in annual quantities not to exceed (i) 717,148 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 107,588 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with priority dates of March 3, 1865, for lands reserved by the Act of March 3, 1865 (13 Stat. 541, 599); November 22, 1873, for lands reserved by the Executive Order of said date; November 16, 1874, for lands reserved by the Executive Order of said date, except as later modified; May 15, 1876, for lands reserved by the Executive Order of said date; November 22, 1915, for lands reserved by the Executive Order of said date;

(e) The Fort Mohave Indian Reservation in annual quantities not to exceed (i) 122,648 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 18,974 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, and, subject to the next succeeding proviso, with priority dates of September 18, 1890, for lands transferred by the Executive Order of said date; February 2, 1911, for lands reserved by the Executive Order of said date; provided, however, that lands conveyed to the State of California pursuant to the Swamp and Overflowed Lands Act (9 Stat. 519 (1850)] as well as any accretions thereto to which the owners of such land may be entitled, and lands patented to the Southern Pacific Railroad pursuant to the Act of July 27, 1866 (14 Stat. 292) shall not be included as irrigable acreage within the Reservation and that the above specified diversion requirement shall be reduced by 6.4 acre-feet per acre of such land that is irrigable;

(f) The Lake Mead National Recreation Area in annual quantities reasonably necessary to fulfill the purposes of the Recreation Area, with priority dates of March 3, 1929, for lands reserved by the Executive Order of said date (No. 5105), and April 25, 1930, for lands reserved by the Executive Order of said date (No. 5339);

(g) The Havasu Lake National Wildlife Refuge in annual quantities reasonably necessary to fulfill the purposes of the Refuge, not to exceed (i) 41,839 acre-feet of water diverted from the mainstream or (ii) 37,339 acre-feet of consumptive use of mainstream water, whichever of (i) or (ii) is less, with a priority date of January 22, 1941, for lands reserved by the Executive Order of said date (No. 8647), and a priority date of February 11, 1949, for land reserved by the Public Land Order of said date (No. 559);

(h) The Imperial National Wildlife Refuge in annual quantities reasonably necessary to fulfill the purposes of the Refuge not to exceed (i) 28,000 acre-feet of water diverted from the mainstream or (ii) 23,000 acre-feet of consumptive use of mainstream water, whichever of (i) or (ii) is less, with a priority date of February 14, 1941.

Provided further, that consumptive uses for the benefit of the above named federal establishments shall be satisfied only out of water allocated, as provided in subdivision (B) of this Article, to each state wherein such uses occur, and only to the extent that their priorities specified herein are senior to other priorities within the state.

III. The States of Arizona, California and Nevada, Palo Verde Irrigation District, Imperial Irrigation District, Coachella Valley County Water District, Metropolitan Water District of Southern California, City of Los Angeles, City of San Diego, and County of San Diego, their officers, attorneys, agents and employees, be and they are hereby severally enjoined:

(A) From interfering with the management and operation, in conformity with Article II of this decree, of regulatory structures controlled by the United States;

(B) From interfering with or permitting the interference with releases and deliveries, in conformity with Article II of this decree, of water controlled by the United States;

(C) From diverting or permitting the diversion of water from the mainstream the diversion of which has not been authorized by the United States for use in the respective states; and provided further that none of the above named political subdivisions of the State of California shall divert or permit the diversion of water from the mainstream the diversion of which has not been authorized by the United States for its particular use;

(D) From consuming or permitting the consumptive use of water from the mainstream in excess of the quantities specified in Article II of this decree.

IV. The State of New Mexico, its officers, attorneys, agents and employees, be and they are after four years from the date of this decree hereby severally enjoined:

(A) From diverting or permitting the diversion of water from San Simon Creek, its tributaries and underground water sources for the irrigation of more than a total of 2,900 acres during any one year, and from exceeding a total consumptive use of such water, for whatever purpose, of 72,000 acre-feet during any period of ten consecutive years; and from exceeding a total consumptive use of such water, for whatever purpose, of 8,220 acre-feet during any one year;

(B) From diverting or permitting the diversion of water from the San Francisco River, its tributaries and underground water sources for the irrigation within each of the following areas of more than the following number of acres during any one year:

Luna Area	225
Apache Creek-Aragon Area	316
Reserve Area	725
Glenwood Area	1,003;

and from exceeding a total consumptive use of such water, for whatever purpose, of 31,870 acre-feet during any period of ten consecutive years; and from exceeding a total consumptive use of such water, for whatever purpose, of 4,112 acre-feet during any one year;

(C) From diverting or permitting the diversion of water from the Gila River, its tributaries (exclusive of the San Francisco River and San Simon Creek and their tributaries) and underground water sources for the irrigation within each of the following areas of more than the following number of acres during any one year:

Upper Gila Area	287
Cliff-Gila and Buckhorn-Duck Creek Area	5,314
Red Rock Area	1,456;

and from exceeding a total consumptive use of such water (exclusive of uses in Virden Valley, New Mexico), for whatever purpose, of 136,620 acre-feet during any period of ten consecutive years; and from exceeding a total consumptive use of such water (exclusive of uses in Virden Valley, New Mexico), for whatever purpose, of 15,895 acre-feet during any one year;

(D) From diverting or permitting the diversion of water from the Gila River and its underground water sources in the Virden Valley, New Mexico, except for use on lands determined to have the right to the use of such water by the decree entered by the United States District Court for the District of Arizona on June 29, 1935, in *United States v. Gila Valley Irrigation District, et al.* (Globe Equity No. 59) (herein referred to as the Gila Decree), and except pursuant to and in accordance with the terms and provisions of the Gila Decree; provided, however, that:

(1) This decree shall not enjoin the use of underground water on any of the following lands:

Owner	Subdivision	Legal Description	Sec.	Twp.	Rng.	Acreage
Marvin Arnett and J. C. O'Dell.	Part Lot 3		6	19S	21W	33.84
	Part Lot 4		6	19S	21W	52.33
	NW¼SW¼		5	19S	21W	38.36
	SW¼SW¼		5	19S	21W	39.80
	Part Lot 1		7	19S	21W	50.68
	NW¼NW¼		8	19S	21W	38.03
Hyrum M. Pace, Ray Richardson, Harry Day and N. O. Pace, Est.	SW¼NE¼		12	19S	21W	8.00
	SW¼NE¼		12	19S	21W	15.00
	SE¼NE¼		12	19S	21W	7.00
C. C. Martin	S. part SE¼SW¼SE¼		1	19S	21W	0.93
	W½W½W½NE¼NE¼		12	19S	21W	0.51
	NW¼NE¼		12	19S	21W	18.01
A. E. Jacobson	SW part Lot 1		6	19S	21W	11.58
W. LeRoss Jones	E. Central part: E½E½E½NW¼NW¼		12	19S	21W	0.70
	SW part NE¼NW¼		12	19S	21W	8.93
	N. Central part: N½N½NW¼SE¼NW¼		12	19S	21W	0.51
Conrad and James R. Donaldson	N½N½N½SE¼		18	19S	20W	8.00
James D. Freestone	Part W½NW¼		33	18S	21W	7.79
Virgil W. Jones	N½SE¼NW¼; SE¼NE¼NW¼		12	19S	21W	7.40
Darrell Brooks	SE¼SW¼		32	18S	21W	6.15
Floyd Jones	Part N½SE¼NE¼		13	19S	21W	4.00
	Part NW¼SW¼NW¼		18	19S	20W	1.70
L. M. Hatch	SW¼SW¼		32	18S	21W	4.40
	Virden Townsite		...	...	...	3.90
Carl M. Donaldson	SW¼SE¼		12	19S	21W	3.40

Owner	Subdivision	Legal Description	Sec.	Twp.	Rng.	Acreage
Mack Johnson	Part	NW¼NW¼NE¼	10	19S	21W	2.80
	Part	NE¼NW¼NE¼	10	19S	21W	0.30
	Part	N½N½S½NW¼NE¼	10	19S	21W	0.10
Chris Dotz	SE¼SE¼;	SW¼SE¼	3	19S	21W	2.66
			10	19S	21W	
Roy A. Johnson	NW¼SE¼SE¼		4	19S	21W	1.00
Ivan and Antone Thygerson	NE¼SE¼SE¼		32	18S	21W	1.00
John W. Bonine	SW¼SE¼SW¼		34	18S	21W	1.00
Marion K. Mortenson	SW¼SW¼SE¼		33	18S	21W	1.00
Total				...	...	380.81

or on lands or for other uses in the Virden Valley to which such use may be transferred or substituted on retirement from irrigation of any of said specifically described lands, up to a maximum total consumptive use of such water of 838.2 acre-feet per annum, unless and until such uses are adjudged by a court of competent jurisdiction to be an infringement or impairment of rights confirmed by the Gila Decree; and

(2) This decree shall not prohibit domestic use of water from the Gila River and its underground water sources on lands with rights confirmed by the Gila Decree, or on farmsteads located adjacent to said lands, or in the Virden Townsite, up to a total consumptive use of 265 acre-feet per annum in addition to the uses confirmed by the Gila Decree, unless and until such use is adjudged by a court of competent jurisdiction to be an infringement or impairment of rights confirmed by the Gila Decree;

(E) Provided, however, that nothing in this Article IV shall be construed to affect rights as between individual water users in the State of New Mexico; nor shall anything in this Article be construed to affect possible superior rights of the United States asserted on behalf of National Forests, Parks, Memorials, Monuments and lands administered by the Bureau of Land Management; and provided further that in addition to the diversions authorized herein the United States has the right to divert water from the mainstream of the Gila and San Francisco Rivers in quantities reasonably necessary to fulfill the purposes of the Gila National Forest with priority dates as of the date of withdrawal for forest purposes of each area of the Forest within which the water is used.

V. The United States shall prepare and maintain, or provide for the preparation and maintenance of, and shall make available, annually and at such shorter intervals as the Secretary of the Interior shall deem necessary or advisable, for inspection at all reasonable times and at a reasonable place or places, complete, detailed and accurate records of:

(A) Releases of water through regulatory structures controlled by the United States;

(B) Diversions of water from the mainstream, return flow of such water to the stream as is available for consumptive use in the United States or in satisfaction of the Mexican treaty obligation, and consumptive use of such water. These quantities shall be stated separately as to each diverter from the mainstream, each point of diversion, and each of the States of Arizona, California and Nevada;

(C) Releases of mainstream water pursuant to orders therefor but not diverted by the party ordering the same, and the quantity of such water delivered to Mexico in satisfaction of the Mexican Treaty or diverted by others in satisfaction of rights decreed herein. These quantities shall be stated separately as to each diverter from the mainstream, each point of diversion, and each of the States of Arizona, California and Nevada;

(D) Deliveries to Mexico of water in satisfaction of the obligations of Part III of the Treaty of February 3, 1944, and, separately stated, water passing to Mexico in excess of treaty requirements;

(E) Diversions of water from the mainstream of the Gila and San Francisco Rivers and the consumptive use of such water, for the benefit of the Gila National Forest.

VI. Within two years from the date of this decree, the States of Arizona, California, and Nevada shall furnish to this Court and to the Secretary of the Interior a list of the present perfected rights, with their priority dates, in waters of the mainstream within each state, respectively, in terms of consumptive use, except those relating to federal establishments. The Secretary of the Interior shall supply similar information, within a similar period of time, with respect to federal establishments within each state. If the three states and the Secretary of the Interior are unable at that time to agree on the present perfected rights to the use of mainstream water in each state, any state or the United States may apply to the Court for the determination of such rights by the Court.

VII. The State of New Mexico shall, within four years from the date of this decree, prepare and maintain, or provide for the preparation and maintenance of, and shall annually thereafter make available for inspection at all reasonable times and at a reasonable place or places, complete, detailed and accurate records of:

(A) The acreages of all lands in New Mexico irrigated each year from the Gila River, the San Francisco River, San Simon Creek and their tributaries and all of their underground water sources, stated by legal description and component acreages and separately as to each of the areas designated in Article IV of this decree and as to each of the three streams;

(B) Annual diversions and consumptive uses of water, in New Mexico, from the Gila River, the San Francisco River and San Simon Creek and their tributaries, and all their underground water sources, stated separately as to each of the three streams.

VIII. This decree shall not affect:

(A) The relative rights *inter sese* of water users within any one of the states, except as otherwise specifically provided herein;

(B) The rights or priorities to water in any of the Lower Basin tributaries of the Colorado River in the States of Arizona, California, Nevada, New Mexico and Utah except the Gila River System;

(C) The rights or priorities, whether under state law or federal law, except as specific provision is made herein, of any Indian Reservation; National Forest, Park, Recreation Area, Monument or Memorial; or lands administered by the Bureau of Land Management.

IX. Any of the parties may apply at the foot of this decree for its amendment or for further relief. The Court retains jurisdiction of this suit for the purpose of any order, direction, or modification of the decree, or any supplementary decree, that may at any time be deemed proper in relation to the subject matter in controversy.

This Report, together with the Findings of Fact and Conclusions of Law therein contained, and the recommended decree thereto annexed are

Respectfully submitted,

SIMON H. RIFKIND
Special Master

New York, N.Y.
December 5, 1960

APPENDIX IX - SUPREME COURT OPINION (June 3, 1963, 373 U.S. 546) and DECREE (March 9, 1964, 376 U.S. 340) in ARIZONA v. CALIFORNIA

901 - Supreme Court Opinion

902 - Supreme Court Decree

OCTOBER TERM, 1962

ARIZONA *v.* CALIFORNIA ET AL.

ON EXCEPTIONS TO SPECIAL MASTER'S REPORT AND RECOMMENDED DECREE.

No. 8, Original. Argued January 8-11, 1962.—Restored to calendar for reargument June 4, 1962.—Reargued November 13-14, 1962.—Decided June 3, 1963.

This original suit was brought in this Court by the State of Arizona against the State of California and seven of its public agencies. Later Nevada, New Mexico, Utah and the United States became parties. The basic controversy is over how much water each State has a legal right to use out of the waters of the Colorado River and its tributaries. A Special Master appointed by the Court conducted a lengthy trial and filed a report containing his findings, conclusions and recommended decree, to which various parties took exceptions. *Held:*

1. In passing the Boulder Canyon Project Act, Congress intended to, and did, create its own comprehensive scheme for the apportionment among California, Arizona and Nevada of the Lower Basin's share of the mainstream waters of the Colorado River, leaving each State her own tributaries. It decided that a fair division of the first 7,500,000 acre-feet of such mainstream waters would give 4,400,000 acre-feet to California, 2,800,000 to Arizona, and 300,000 to Nevada, and that Arizona and California should each get one-half of any surplus. Congress gave the Secretary of the Interior adequate authority to accomplish this division by giving him power to make contracts for the delivery of water and by providing that no person could have water without a contract. Pp. 546-590.

(a) Apportionment among the Lower Basin States of that Basin's Colorado River water is not controlled by the doctrine of equitable apportionment or by the Colorado River Compact. Pp. 565-567.

(b) No matter what waters the Compact apportioned, the Project Act itself dealt only with water of the mainstream and reserved to each State the exclusive use of the waters of her own tributaries. Pp. 567-565.

(c) The legislative history of the Act, its language and the scheme established by it for the storage and delivery of water show that Congress intended to provide its own method for a complete apportionment of the Lower Basin's share of the mainstream water among Arizona, California and Nevada; and Congress intended the Secretary of the Interior, through his contracts under § 5, both to carry out the allocation of the waters of the main Colorado River among the Lower Basin States and to decide which users within each State would get water. Pp. 575-585.

(d) It is the Act and the contracts made by the Secretary of the Interior under § 5, not the law of prior appropriation, that control the apportionment of water among the States; and the Secretary, in choosing between the users within each State and in settling the terms of his contracts, is not required by §§ 14 and 18 of the Act to follow state law. Pp. 585-586.

(e) Section 8 of the Reclamation Act does not require the United States, in the delivery of water, to follow priorities laid down by state law; and the Secretary is not bound by state law in disposing of water under the Project Act. Pp. 586-587.

(f) The general saving language of § 18 of the Project Act does not bind the Secretary by state law or nullify the contract power expressly conferred upon him by § 5 Pp. 587-588.

(g) Congress has put the Secretary of the Interior in charge of a whole network of useful projects constructed by the Federal Government up and down the Colorado River, and it has entrusted him with sufficient power, principally the § 5 contract power, to direct, manage and coordinate their operation. This power must be construed to permit him to allocate and distribute the waters of the mainstream of the Colorado River within the boundaries set down by the Act. Pp. 588-590.

2. Certain provisions in the Secretary's contracts are sustained, with one exception. Pp. 590-592.

(a) The Secretary's contracts with Arizona and Nevada are sustained, insofar as they provide that any waters diverted by those States out of the mainstream above Lake Mead must be charged to their respective Lower Basin apportionments; but he cannot reduce water deliveries to those States by the amount of their uses from tributaries above Lake Mead, since Congress intended to apportion only the mainstream, leaving to each State her own tributaries. Pp. 590-591.

(b) The fact that the Secretary has made a contract directly with the State of Nevada, through her Colorado River Commission, for the delivery of water does not impair the Secretary's power to require Nevada water users, other than the State, to make further contracts. Pp. 591-592.

3. In case of water shortage, the Secretary is not bound to require a pro rata sharing of shortages. He must follow the standards set out in the Act; but he is free to choose among the recognized methods of apportionment or to devise reasonable methods of his own, since Congress has given him full power to control, manage and operate the Government's Colorado River works and to make contracts for the sale and delivery of water on such terms as are not prohibited by the Act. Pp. 592-594.

4. With respect to the conflicting claims of Arizona and New Mexico to water in the Gila River, the compromise settlement agreed upon by those States and incorporated in the Master's recommended decree is accepted by this Court. Pp. 594-595.

5. As to the claims asserted by the United States to waters in the main river and some of its tributaries for use on Indian reservations, national forests, recreational and wildlife areas and other government lands and works, this Court approves the Master's decision as to which claims required adjudication, and it approves the decree he recommended for the government claims he did decide. Pp. 595-601.

(a) This Court sustains the Master's finding that, when the United States created the Chemehuevi, Cocopah, Yuma, Colorado River and Fort Mohave Indian Reservations in Arizona, California and Nevada, or added to them, it reserved not only the land but also the use of enough water from the Colorado River to irrigte the irrigable portions of the reserved lands. Pp. 595-597.

(1) The doctrine of equitable apportionment should not be used to divide the water between the Indians and the other people in the State of Arizona. P. 597.

(2) Under its broad powers to regulate navigable waters under the Commerce Clause and to regulate government lands under Art. IV, § 3, of the Constitution, the United States had power to reserve water rights for its reservations and its property. Pp. 597-598.

(3) The reservations of land and water are not invalid though they were originally set apart by Executive Order. P. 598.

(4) The United States reserved the water rights for the Indians, effective as of the time the Indian reservations were created, and these water rights, having vested before the Act became effective in 1929, are "present perfected rights" and as such are entitled to priority under the Act. Pp. 598-600.

(5) This Court sustains the Master's conclusions that enough water was intended to be reserved to satisfy the future, as well as the present, needs of the Indian reservations and that enough water was reserved to irrigate all the practicably irrigable acreage on the reservations, and also his findings as to the various acreages of irrigable land existing on the different reservations. Pp. 600-601.

(b) This Court disagrees with the Master's decision to determine the disputed boundaries of the Colorado River Indian Reservation and the Fort Mohave Indian Reservation, since it is not necessary to resolve those disputes here. P. 601.

(c) This Court agrees with the Master's conclusions that the United States intended to reserve water sufficient for the future requirements of the Lake Mead National Recreational Area, the Havasu Lake National Wildlife Refuge, the Imperial National Wildlife Refuge and the Gila National Forest. P. 601.

(d) This Court rejects the claim of the United States that it is entitled to the use, without charge against its consumption, of any waters that would have been wasted but for salvage by the Government on its wildlife preserves. P. 601.

(e) This Court agrees with the Master that all uses of mainstream water within a State are to be charged against that State's apportionment, which, of course, includes uses by the United States. P. 601.

Mark Wilmer reargued the cause for complainant. With him on the briefs were *Chas. H. Reed, William R. Meagher, Burr Sutter, John E. Madden, Calvin H. Udall, John Geoffrey Will, W. H. Roberts* and *Theodore Kiendl.*

Northcutt Ely, Special Assistant Attorney General of California, reargued the cause for the State of California et al., defendants. With him on the briefs were *Stanley Mosk,* Attorney General, *Charles E. Corker* and *Gilbert F. Nelson,* Assistant Attorneys General, *Burton J. Gindler, John R. Alexander* and *Gerald Malkan,* Deputy Attorneys General, *Shirley M. Hufstedler, Howard I. Friedman, C. Emerson Duncan II, Jerome C. Muys, Francis E. Jenney, Stanley C. Lagerlof, Roy H. Mann, Harry W. Horton, R. L. Knox, Jr., Earl Redwine, James H. Howard, Charles C. Cooper, Jr., H. Kenneth Hutchinson, Frank P. Doherty, Roger Arnebergh, Gilmore Tillman, Alan M. Firestone, Jean F. DuPaul* and *Henry A. Dietz.*

Solicitor General Cox reargued the cause for the United States, intervener. With him on the briefs were *John F. Davis, David R. Warner, Walker Kiechel, Jr.* and *Warren R. Wise.*

R. P. Parry reargued the cause for the State of Nevada, intervener. With him on the briefs were *Roger D. Foley,* Attorney General, *W. T. Mathews* and *Clifford E. Fix.*

Walter L. Budge, Attorney General of Utah, and *Dennis McCarthy,* Special Assistant Attorney General, filed a statement on behalf of the State of Utah.

Earl E. Hartley, Attorney General of New Mexico, *Thomas O. Olson,* First Assistant Attorney General, and *Claude S. Mann* and *Dudley Cornell,* Special Assistant Attorneys General, filed a brief for the State of New Mexico.

MR. JUSTICE BLACK delivered the opinion of the Court.

In 1952 the State of Arizona invoked the original jurisdiction of this Court[1] by filing a complaint against the State of California and seven of its public agencies.[2] Later, Nevada, New Mexico, Utah, and the United States were added as parties either voluntarily or on motion.[3] The basic controversy in the case is over how much water each State has a legal right to use out of the waters of the Colorado River and its tributaries. After preliminary pleadings, we referred the case to George I. Haight, Esquire, and upon his death in 1955 to Simon H. Rifkind, Esquire, as Special Master to take evidence, find facts, state conclusions of law, and recommend a decree, all "subject to consideration, revision, or approval by the Court."[4] The Master conducted a trial lasting from June 14, 1956, to August 28, 1958, during which 340 witnesses were heard orally or by deposition, thousands of exhibits were received, and 25,000 pages of transcript were filled. Following many motions, arguments, and briefs, the Master in a 433-page volume reported his findings, conclusions, and recommended decree, received by the Court on January 16, 1961.[5] The case has been extensively briefed here and orally argued twice, the first time about 16 hours, the second, over six. As we see this case, the question of each State's share of the waters of the Colorado and its tributaries turns on the meaning and the scope of the Boulder Canyon Project Act passed by Congress in 1928.[6] That meaning and scope can be better understood when the Act is set against its background—the gravity of the Southwest's water problems; the inability of local groups or individual States to deal with these enormous problems; the continued failure of the States to agree on how to conserve and divide the waters; and the ultimate action by Congress at the request of the States creating a great system of dams and public works nationally built, controlled, and operated for the purpose of conserving and distributing the water.

The Colorado River itself rises in the mountains of Colorado and flows generally in a southwesterly direction for about 1,300 miles through Colorado, Utah, and Arizona and along the Arizona-Nevada and Arizona-California boundaries, after which it passes into Mexico and empties into the Mexican waters of the Gulf of California. On its way to the sea it receives tributary waters from Wyoming, Colorado, Utah, Nevada, New Mexico, and Arizona. The river and its tributaries flow in a natural basin almost surrounded by large mountain ranges and drain 242,000 square miles, an area about 900 miles long from north to south and 300 to 500 miles wide from east to west—practically one-twelfth the area of the continental United States excluding Alaska. Much of this large basin is so arid that it is, as it always has been, largely dependent upon managed use of the waters of the Colorado River System to make it productive and inhabitable. The Master refers to archaeological evidence that as long as 2,000 years ago the ancient Hohokam tribe built and maintained irrigation canals near what is now Phoenix, Arizona, and that American Indians were practicing irrigation in that region at the time white men first explored it. In the second half of the nineteenth century a group of people interested in California's Imperial Valley conceived plans to divert water from the mainstream of the Colorado to give life and growth to the parched and barren soil of that valley. As the most feasible route was through

[1] "The judicial Power shall extend . . . to Controversies between two or more States . . . .
"In all Cases . . . in which a State shall be Party, the supreme Court shall have original Jurisdiction." U.S. Const., Art. III, § 2. See also 28 U.S.C. § 1251 (a) (1).
Three times previously Arizona has instituted actions in this Court concerning the Colorado River. *Arizona* v. *California,* 283 U.S. 423 (1931); *Arizona* v. *California,* 292 U.S. 341 (1934); *Arizona* v. *California,* 298 U.S. 558 (1936). See also *United States* v. *Arizona,* 295 U.S. 174 (1935).

[2] Palo Verde Irrigation District, Imperial Irrigation District, Coachella Valley County Water District, Metropolitan Water District of Southern California, City of Los Angeles, City of San Diego, and County of San Diego.

[3] 344 U.S. 919 (1953) (intervention by United States); 347 U.S. 985 (1954) (intervention by Nevada); 350 U.S. 114 (1955) (joinder of Utah and New Mexico).

[4] The two orders are reported at 347 U.S. 986 (1954), and 350 U.S. 812 (1955).

[5] 364 U.S. 940 (1961).

[6] Boulder Canyon Project Act, 45 Stat. 1057 (1928), 43 U.S.C. §§ 617-617t.

Mexico, a Mexican corporation was formed and a canal dug partly in Mexico and partly in the United States. Difficulties which arose because the canal was subject to the sovreignty of both countries generated hopes in this country that some day there would be a canal wholly within the United States, an all-American canal.[7]

During the latter part of the nineteenth and the first part of the twentieth centuries, people in the Southwest continued to seek new ways to satisfy their water needs, which by that time were increasing rapidly as new settlers moved into this fast-developing region. But none of the more or less primitive diversions made from the mainstream of the Colorado conserved enough water to meet the growing needs of the basin. The natural flow of the Colorado was too erratic, the river at many places in canyons too deep, and the engineering and economic hurdles too great for amll farmers, larger groups, or even States to build storage dams, construct canals, and install the expensive works necessary for a dependable year-round water supply. Nor were droughts the basin's only problem; spring floods due to melting snows and seasonal storms were a recurring menace, especially disastrous in California's Imperial Valley where, even after the Mexican canal provided a more dependable water supply, the threat of flood remained at least as serious as before. Another troublesome problem was the erosion of land and the deposit of silt which fouled waters, choked irrigation works, and damaged good farmland and crops.

It is not surprising that the pressing necessity to transform the erratic and often destructive flow of the Colorado River into a controlled and dependable water supply desperately needed in so many States began to be talked about and recognized as far more than a purely local problem which could be solved on a farmer-by-farmer, group-by-group, or even state-by-state basis, desirable as this kind of solution might have been. The inadequacy of a local solution was recognized in the Report of the All-American Canal Board of the United States Department of the Interior on July 22, 1919, which detailed the widespread benefits that could be expected from construction by the United States of a large reservoir on the mainstream of the Colorado and an all-American canal to the Imperial Valley.[8] Some months later, May 18, 1920, Congress passed a bill offered by Congressman Kinkaid of Nebraska directing the Secretary of the Interior to make a study and report of diversions which might be made from the Colorado River for irrigation in the Imperial Valley.[9] The Fall-Davis Report,[10] submitted to Congress in compliance with the Kinkaid Act, began by declaring, "The control of the floods and development of the resources of the Colorado River are peculiarly national problems . . ."[11] and then went on to give reasons why this was so, concluding with the statement that the job was so big that only the Federal Government could do it.[12] Quite naturally, therefore, the Report recommended that the United States construct as a government project not only an all-American canal from the Colorado River to the Imperial Valley but also a dam and reservoir at or near Boulder Canyon.[13]

The prospect that the United States would undertake to build as a national project the necessary works to control floods and store river waters for irrigation was apparently a welcome one for the basin States. But it brought to life strong fears in the northern basin States that additional waters made available by the storage and canal projects might be gobbled up in perpetuity by faster growing lower basin areas, particularly California, before the upper States could appropriate what they believed to be their fair share. These fears were not without foundation, since the law of prior appropriation prevailed in most of the Western States.[14] Under that

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[7]"[The All-American Canal] will end an intolerable situation, under which the Imperial Valley now secures its sole water supply from a canal running for many miles through Mexico . . . ." S. Rep. No. 592, 70th Cong., 1st Sess. 8 (1928).

[8]Department of the Interior, Report of the All-American Canal Board (1919), 23-33. The three members of the Board were engineers with long experience in Western water problems.

[9]41 Stat. 600 (1920).

[10]S. Doc. No. 142, 67th Cong., 2d Sess. (1922).

[11]*Id.*, at 1.

[12]The reasons given were:

"1. The Colorado Rier is international.

"2. The stream and many of its tributaries are interstate.

"3. It is a navigable river.

"4. Its waters may be made to serve large areas of public lands naturally desert in character.

"5. Its problems are of such magnitude as to be beyond the reach of other than national solution." *Ibid.*

[13]*Id.*, at 21.

[14]This law prevails exclusively in all the basin States except California. See I Wiel, Water Rights in the Western States § 66 (3d ed., 1911); Hutchins, Selected Problems in the Law of Water Rights in the West 30-31 (1942) (U.S. Dept. of Agriculture Misc. Pub. No. 418). Even in California it is important. See 51 Cal. Jur. 2d Waters §§ 257-264 (1959).

law the one who first appropriates water and puts it to beneficial use thereby acquires a vested right to continue to divert and use that quantity of water against all claimants junior to him in point of time.[15] "First in time, first in right" is the shorthand expression of this legal principle. In 1922, only four months after the Fall-Davis Report, this Court in *Wyoming* v. *Colorado*, 259 U.S. 419, held that the doctrine of prior appropriation could be given interstate effect.[16] This decision intensified fears of Upper Basin States that they would not get their fair share of Colorado River water.[17] In view of California's phenomenal growth, the Upper Basin States had particular reason to fear that California, by appropriating and using Colorado River water before the upper States, would, under the interstate application of the prior appropriation doctrine, be "first in time" and therefore "first in right." Nor were such fears limited to the northernmost States. Nevada, Utah, and especially Arizona were all apprehensive that California's rapid declaration of appropriative claims would deprive them of their just share of basin water available after construction of the proposed United States project. It seemed for a time that these fears would keep the States from agreeing on any kind of division of the river waters. Hoping to prevent "conflicts" and "expensive litigation" which would hold up or prevent the tremendous benefits expected from extensive federal development of the river,[18] the basin States requested and Congress passed an Act on August 19, 1921, giving the States consent to negotiate and enter into a compact for the "equitable division and apportionment . . . of the water supply of the Colorado River."[19]

Pursuant to this congressional authority, the seven States appointed Commissioners who, after negotiating for the better part of a year, reached an agreement at Santa Fe, New Mexico, on November 24, 1922. The agreement, known as the Colorado River Compact,[20] failed to fulfill the hope of Congress that the States would themselves agree on each State's share of the water. The most the Commissioners were able to accomplish in the Compact was to adopt a compromise suggestion of Secretary of Commerce Herbert Hoover, specially designated as United States representative.[21] This compromise divides the entire basin into two parts, the Upper Basin and the Lower Basin, separated at a point on the river in northern Arizona known as Lee Ferry. (A map showing the two basins and other points of interest in this controversy is printed as an Appendix facing p. 602.) Article III (a) of the Compact apportions to each basin in perpetuity 7,500,000 acre-feet of water[22] a year from the Colorado River System, defined in Article II (a) as "the Colorado River and its tributaries within the United States of America." In addition, Article III (b) gives the Lower Basin "the right to increase its beneficial consumptive use[23] of such waters by one million acre-feet per annum." Article III (c) provides that future Mexican water rights recognized by the United States shall be supplied first out of surplus over and above the aggregate of the quantities specified in (a) and (b), and if this surplus is not enough the deficiency shall be borne equally by the two basins. Article III (d) requires the Upper Basin not to deplete the Lee Ferry flow below an aggregate of 75,000,000 acre-feet for any 10 consecutive years. Article III (f) and (g) provide a way for further apportionment by a compact of "Colorado River System" waters at any time after October 1, 1963. While these allocations quieted rivalries between the Upper and Lower Basins, major differences between the States in the Lower Basin continued. Failure of the Compact to determine each State's share of the water left Nevada and Arizona with their fears that the law of prior appropriation would be not a protection but a menace because California could use that law to get for herself the lion's share of the waters

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[15] *Hinderlider* v. *La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92, 98 (1938); *Arizona* v. *California*, 283 U.S. 423, 459 (1931).

[16] The doctrine continues to be applied interstate. *E.g.*, *Nebraska* v. *Wyoming*, 325 U.S. 589, 617-618 (1945).

[17] "Delph E. Carpenter, Colorado River Commissioner for the State of Colorado, summarized the situation produced by that decision as follows:

" 'The upper state has but one alternative, that of using every means to retard development in the lower state until the uses within the upper state have reached their maximum. The states may avoid this unfortunate situation by determining their respective rights by interstate compact before further development in either state, thus permitting freedom of development in the lower state without injury to future growth in the upper.'

"The final negotiation of the compact took place in the atmosphere produced by that decision." H.R. Doc. No. 717, 80th Cong., 2d Sess. 22 (1948).

[18] H.R. Rep. No. 191, 67th Cong., 1st Sess. (1921).

[19] 42 Stat. 171 (1921).

[20] The Compact can be found at 70 Cong. Rec. 324 (1928), and U.S. Dept. of the Interior, Documents on the Use and Control of the Waters of Interstate and International Streams 39 (1956).

[21] H. R. Doc. No. 717, 80th Cong., 2d Sess. 22 (1948).

[22] An acre-foot of water is enough to cover an acre of land with one foot of water.

[23] "Beneficial consumptive use" means consumptive use measured by diversions less return flows, for a beneficial (nonwasteful) purpose.

allotted to the Lower Basin. Moreover, Arizona, because of her particularly strong interest in the Gila, intensely resented the Compact's inclusion of the Colorado River tributaries in its allocation scheme and was bitterly hostile to having Arizona tributaries, again particularly the Gila, forced to contribute to the Mexican burden. Largely for these reasons, Arizona alone, of all the States in both basins, refused to ratify the Compact.[24]

Seeking means which would permit ratification by all seven basin States, the Governors of those States met at Denver in 1925 and again in 1927. As a result of these meetings the Governors of the upper States suggested, as a fair apportionment of water among the Lower Basin States, that out of the average annual delivery of water at Lee Ferry required by the Compact—7,500,000 acre-feet—Nevada be given 300,000 acre-feet, Arizona 3,000,000, and California 4,200,000, and that unapportioned waters, subject to reapportionment after 1963, be shared equally by Arizona and California. Each Lower Basin State would have "the exclusive beneficial consumptive use of such tributaries within its boundaries before the same empty into the main stream," except that Arizona tributary waters in excess of 1,000,000 acre-feet could under some circumstances be subject to diminution by reason of a United States treaty with Mexico. This proposal foundered because California held out for 4,600,000 acre-feet instead of 4,200,000[25] and because Arizona held out for complete exemption of its tributaries from any part of the Mexican burden.[26]

Between 1922 and 1927 Congressman Philip Swing and Senator Hiram Johnson, both of California, made three attempts to have Swing-Johnson bills enacted, authorizing construction of a dam in the canyon section of the Colorado River and an all-American canal.[27] These bills would have carried out the original Fall-Davis Report's recommendations that the river problem be recognized and treated as national, not local. Arizona's Senators and Congressmen, still insisting upon a definite guaranty of water from the mainstream, bitterly fought these proposals because they failed to provide for exclusive use of her own tributaries, particularly the Gila, and for exemption of these tributaries from the Mexican burden.

Finally, the fourth Swing-Johnson bill passed both Houses and became the Boulder Canyon Project Act of December 21, 1928, 45 Stat. 1057. The Act authorized the Secretary of the Interior to construct, operate, and maintain a dam and other works in order to control floods, improve navigation, regulate the river's flow, store and distribute waters for reclamation and other beneficial uses, and generate electrical power.[28] The projects authorized by the Act were the same as those provided for in the prior defeated measures, but in other significant respects the Act was strikingly different. The earlier bills had offered no method whatever of apportioning the waters among the States of the Lower Basin. The Act as finally passed did provide such a method, and, as we view it, the method chosen was a complete statutory apportionment intended to put an end to the long-standing dispute over Colorado River waters. To protect the Upper Basin against California should Arizona still refuse to ratify the Compact,[29] § 4 (a) of the Act as finally passed provided that, if fewer than seven States ratified within six months, the Act should not take effect unless six States including California ratified and unless California, by its legislature, agreed "irrevocably and unconditionally . . . as an express covenant" to a limit on its annual consumption of Colorado River water of "four million four hundred thousand acre-feet of the waters apportioned to the lower basin States by paragraph (a) of Article III of the Colorado River compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact." Congress in the same section showed its continuing desire to have California, Arizona, and Nevada settle their own differences by authorizing them to make an agreement apportioning to Nevada 300,000 acre-feet, and to Arizona 2,800,000 acre-feet plus half of any surplus waters unapportioned by the Compact. The permitted agreement also was to allow Arizona exclusive use of the Gila River, wholly free

[24]Arizona did ratify the Compact in 1944, after it had already become effective by six-state ratification as permitted by the Boulder Canyon Project Act.

[25]Hearings on H. R. 5773 before the House Committee on Irrigation and Reclamation, 70th Cong., 1st Sess. 402-405 (1928).

[26]*Id.*, at 30-31. Arizona also objected to the provisions concerning electrical power.

[27]H. R. 11449, 67th Cong., 2d Sess. (1922); H. R. 2903, S. 727, 68th Cong., 1st Sess. (1923); H. R. 9826, S. 3331, 69th Cong., 1st Sess. (1926).

[28]Another purpose of the Act was to approve the Colorado River Compact, which had allocated the water between the two basins.

[29]The Upper Basin States feared that, if Arizona did not ratify the Compact, the division of water between the Upper and Lower Basins agreed on in the Compact would be nullified. The reasoning was that Arizona's uses would not be charged against the Lower Basin's apportionment and that California would therefore be free to exhaust that apportionment herself. Total Lower Basin uses would then be more than permitted in the Compact, leaving less water for the Upper Basin.

from any Mexican obligation, a position Arizona had taken from the beginning. Sections 5 and 8 (b) of the Project Act made provisions for the sale of the stored waters. The Secretary of the Interior was authorized by § 5 "under such general regulations as he may prescribe, to contract for the storage of water in said reservoir and for the delivery thereoff at such points on the river and on said canal as may be agreed upon, for irrigation and domestic uses . . . ." Section 5 required these contracts to be "for permanent service" and further provided, "No person shall have or be entitled to have the use for any purpose of the water stored as aforesaid except by contract made as herein stated." Section 8 (b) provided that the Secretary's contracts would be subject to any compact dividing the benefits of the water between Arizona, California, and Nevada, or any two of them, approved by Congress on or before January 1, 1929, but that any such compact approved after that date should be "subject to all contracts, if any, made by the Secretary of the Interior under section 5 hereof prior to the date of such approval and consent by Congress."

The Project Act became effective on June 25, 1929, by Presidential Proclamation,[30] after six States, including California, had ratified the Colorado River Compact and the California legislature had accepted the limitation of 4,400,000 acre-feet[31] as required by the Act. Neither the three States nor any two of them ever entered into any apportionment compact as authorized by §§ 4 (a) and 8 (b). After the construction of Boulder Dam the Secretary of the Interior, purporting to act under the authority of the Project Act, made contracts with various water users in California for 5,362,000 acre-feet, with Nevada for 300,000 acre-feet, and with Arizona for 2,800,000 acre-feet of water from that stored at Lake Mead.

The Special Master appointed by this Court found that the Colorado River Compact, the law of prior appropriation, and the doctrine of equitable apportionment—by which doctrine this Court in the absence of statute resolves interstate claims according to the equities—do not control the issues in this case. The Master concluded that, since the Lower Basin States had failed to make a compact to allocate the waters among themselves as authorized by §§ 4 (a) and 8 (b), the Secretary's contracts with the States had within the statutory scheme of §§ 4 (a), 5, and 8 (b) effected an apportionment of the waters of the mainstream which, according to the Master, were the only waters to be apportioned under the Act. The Master further held that, in the event of a shortage of water making it impossible for the Secretary to supply all the water due California, Arizona, and Nevada under their contracts, the burden of the shortage must be borne by each State in proportion to her share of the first 7,500,000 acre-feet allocated to the Lower Basin, that is, $\frac{4.4}{7.5}$ by California, $\frac{2.8}{7.5}$ by Arizona, and $\frac{.3}{7.5}$ by Nevada, without regard to the law of prior appropriation.

Arizona, Nevada, and the United States support with few exceptions the analysis, conclusions, and recommendations of the Special Master's report. These parties agree that Congress did not leave division of the waters to an equitable apportionment by this Court but instead created a comprehensive statutory scheme for the allocation of mainstream waters. Arizona, however, believes that the allocation formula established by the Secretary's contracts was in fact the formula required by the Act. The United States, along with California, thinks the Master should not have invalidated the provisions of the Arizona and Nevada water contracts requiring those States to deduct from their allocations any diversions of water above Lake Mead which reduce the flow into that lake.

California is in basic disagreement with almost all of the Master's Report. She argues that the Project Act, like the Colorado River Compact, deals with the entire Colorado River System, not just the mainstream. This would mean that diversions within Arizona and Nevada of tributary waters flowing in those States would be charged against their apportionments and that, because tributary water would be added to the mainstream water in computing the first 7,500,000 acre-feet available to the States, there would be a greater likelihood of a surplus, of which California gets one-half. The result of California's argument would be much more water for California and much less for Arizona. California also argues that the Act neither allocates the Colorado River waters nor gives the Secretary authority to make an allocation. Rather she takes the position that the judicial doctrine of equitable apportionment giving full interstate effect to the traditional western water law of prior appropriation should determine the rights of the parties to the water. Finally, California claims that in any event the Act does not control in time of shortage. Under such circumstances, she says, this Court should

[30] 46 Stat. 3000 (1929).

[31] California Limitation Act, Cal. Stat. 1929, c. 16, at 38.

divide the waters according to the doctrine of equitable apportionment or the law of prior appropriation, either of which, she argues, should result in protecting her prior uses.

Our jurisdiction to entertain this suit is not challenged and could not well be since Art. III, § 2, of the Constitution gives this Court original jurisdiction of actions in which States are parties. In exercising that jurisdiction, we are mindful of this Court's often expressed preference that, where possible, States settle their controversies by "mutual accommodation and agreement."[32] Those cases and others[33] make it clear, however, that this Court does have a serious responsibility to adjudicate cases where there are actual, existing controversies over how interstate streams should be apportioned among States. This case is the most recent phase of a continuing controversy over the water of the Colorado River, which the States despite repeated efforts have been unable to settle. Resolution of this dispute requires a determination of what apportionment, if any, is made by the Project Act and what powers are conferred by the Act upon the Secretary of the Interior. Unless many of the issues presented here are adjudicated, the conflicting claims of the parties will continue, as they do now, to raise serious doubts as to the extent of each State's right to appropriate water from the Colorado River System for existing or new uses. In this situation we should and do exercise our jurisdiction.

I

ALLOCATION OF WATER AMONG THE STATES AND DISTRIBUTION TO USERS.

We have concluded, for reasons to be stated, that Congress in passing the Project Act intended to and did create its own comprehensive scheme for the apportionment among California, Arizona, and Nevada of the Lower Basin's share of the mainstream waters of the Colorado River, leaving each State its tributaries. Congress decided that a fair division of the first 7,500,000 acre-feet of such mainstream waters would give 4,400,000 acre-feet to California, 2,800,000 to Arizona, and 300,000 to Nevada; Arizona and California would each get one-half of any surplus. Prior approval was therefore given in the Act for a tri-state compact to incorporate these terms. The States, subject to subsequent congressional approval, were also permitted to agree on a compact with different terms. Division of the water did not, however, depend on the States' agreeing to a compact, for Congress gave the Secretary of the Interior adequate authority to accomplish the division. Congresss did this by giving the Secretary power to make contracts for the delivery of water and by providing that no person could have water without a contract.

A. *Relevancy of Judicial Apportionment and Colorado River Compact.*—We agree with the Master that apportionment of the Lower Basin waters of the Colorado River is not controlled by the doctrine of equitable apportionment or by the Colorado River Compact. It is true that the Court has used the doctrine of equitable apportionment to decide river controversies between States.[34] But in those cases Congress had not made any statutory apportionment. In this case, we have decided that Congress has provided its own method for allocating among the Lower Basin States the mainstream water to which they are entitled under the Compact. Where Congress has so exercised its constitutional power over waters, courts have no power to substitute their own notions of an "equitable apportionment" for the apportionment chosen by Congress. Nor does the Colorado River Compact control this case. Nothing in that Compact purports to divide water among the Lower Basin States nor in any way to affect or control any future apportionment among those States or any distribution of water within a State. That the Commissioners were able to accomplish even a division of water between the basins is due to what is generally known as the "Hoover Compromise."

> "Participants [in the Compact negotiations] have stated that the negotiations would have broken up but for Mr. Hoover's proposal: that the Commission limit its efforts to a division of water between the upper basin and the lower basin, leaving to each basin the future internal allocation of its share."[35]

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[32] *Colorado* v. *Kansas*, 320 U.S. 383, 392 (1943); *Nebraska* v. *Wyoming*, 325 U.S. 589, 616 (1945).

[33] E.g., *Kansas* v. *Colorado*, 185 U.S. 125 (1902); *New Jersey* v. *New York*, 283 U.S. 336 (1931).

[34] E.g., *Wyoming* v. *Colorado*, 259 U.S. 419 (1922); *Nebraska* v. *Wyoming*, 325 U.S. 589 (1945).

[35] H. R. Doc. No. 717, 80th Cong., 2d Sess. 22 (1948).

And in fact this is all the Compact did. However, the Project Act, by referring to the Compact in several places, does make the Compact relevent to a limited extent. To begin with, the Act explicitly approves the Compact and thereby fixes a division of the waters between the basins which must be respected. Further, in several places the Act refers to terms contained in the Compact. For example, § 12 of the Act adopts the Compact definition of "domestic,"[36] and § 6 requires satisfaction of "present perfected rights" as used in the Compact.[37] Obviously, therefore, those particular terms, though originally formulated only for the Compact's allocation of water between basins, are incorporated into the Act and are made applicable to the Project Act's allocation among Lower Basin States. The Act also declares that the Secretary of the Interior and the United States in the construction, operation, and maintenance of the dam and other works and in the making of contracts shall be subject to and controlled by the Colorado River Compact.[38] These latter references to the Compact are quite different from the Act's adoption of Compact terms. Such references, unlike the explicit adoption of terms, were used only to show that the Act and its provisions were in no way to upset, alter, or affect the Compact's congressionally approved division of water between the basins. They were not intended to make the Compact and its provisions control or affect the Act's allocation among and distribution of water within the States of the Lower Basin. Therefore, we look to the Compact for terms specifically incorporated in the Act, and we would also look to it to resolve disputes between the Upper and Lower Basins, were any involved in this case. But no such questions are here. We must determine what apportionment and delivery scheme in the Lower Basin has been effected through the Secretary's contracts. For that determination, we look to the Project Act alone.

B. *Mainstream Apportionment.*—The congressional scheme of apportionment cannot be understood without knowing what water Congress wanted apportioned. Under California's view, which we reject, the first 7,500,000 acre-feet of Lower Basin water, of which California has agreed to use only 4,400,000, is made up of both mainstream and tributary water, not just mainstream water. Under the view of Arizona, Nevada, and the United States, with which we agree, the tributaries are not included in the waters to be divided but remain for the exclusive use of each State. Assuming 7,500,000 acre-feet or more in the mainstream and 2,000,000 in the tributaries, California would get 1,000,000 acre-feet more if the tributaries are included and Arizona 1,000,000 less.[39]

California's argument that the Project Act, like the Colorado River Compact, deals with the main river and all its tributaries rests on § 4 (a) of the Act, which limits California to 4,400,000 acre-feet "of the waters apportioned to the lower basin States by paragraph (a) of Article III of the Colorado River compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact . . . ." And Article III(a), referred to by § 4 (a), apportioned in perpetuity to the Lower Basin the use of 7,500,000 acre-feet of water per annum "from the Colorado River System," which was defined in the Compact as "that portion of the Colorado River and its tributaries within the United States of America."

Arizona argues that the Compact apportions between basins only the waters of the mainstream, not the mainstream and the tributaries. We need not reach that question, however, for we have concluded that whatever waters the Compact apportioned the Project Act itself dealt only with water of the mainstream. In the first place, the Act, in § 4 (a), states that the California limitation, which is in reality her share of the first 7,500,000 acre-feet of Lower Basin water, is on "water of and from the Colorado River," not of and from the "Colorado River System." But more importantly, the negotiations among the States and the congressional debates leading to the passage of the Project Act clearly show that the language used by Congress in the Act was meant to refer to mainstream waters only. Inclusion of the tributaries in the Compact was natural in view of the upper States' strong feeling that the Lower Basin tributaries should be made to share the burden of any obligation to deliver water to Mexico which a future treaty might impose. But when it came to an apportionment among the Lower Basin States, the Gila, by far the most important Lower Basin tributary, would not logically be included, since Arizona alone of the States could effectively use that river.[40] Therefore, with

[36]" 'Domestic' whenever employed in this Act shall include water uses defined as 'domestic' in said Colorado River compact."

[37]The dam and reservoir shall be used, among other things, for "satisfaction of present perfected rights in pursuance of Article VIII of said Colorado River compact."

[38]§§ 1, 8 (a), 13 (b) and (c).

[39]Also, California would reduce Nevada's share of the mainstream waters from 300,000 acre-feet to 120,500 acre-feet.

[40]Not only does the Gila enter the Colorado almost at the Mexican border, but also in dry seasons it virtually evaporates before reaching the Colorado.

minor exceptions, the proposals and counterproposals over the years, culminating in the Project Act, consistently provided for division of the mainstream only, reserving the tributaries to each State's exclusive use.

The most important negotiations among the States, which in fact formed the basis of the debates leading to passage of the Act, took place in 1927 when the Governors of the seven basin States met at Denver in an effort to work out an allocation of the Lower Basin waters acceptable to Arizona, California, and Nevada. Arizona and California made proposals,[41] both of which suggested giving Nevada 300,000 acre-feet out of the mainstream of the Colorado River and reserving to each State the exclusive use of her own tributaries. Arizona proposed that all remaining mainstream water be divided equally between herself and California, which would give each State 3,600,000 acre-feet out of the first 7,500,000 acre-feet of mainstream water. California rejected the proposed equal division of the water, suggesting figures that would result in her getting about 4,600,000 out of the 7,500,000. The Governors of the four Upper Basin States, trying to bring Arizona and California together, asked each State to reduce its demands and suggested this compromise: Nevada 300,000 acre-feet, Arizona 3,000,000, and California 4,200,000.[42] These allocations were to come only out of the mainstream, that is, as stated by the Governors, out of "the average annual delivery of water to be provided by the states of the upper division at Lees Ferry, under the terms of the Colorado River Compact." The Governors' suggestions, like those of the States, explicitly reserved to each State as against the other States the exclusive use of her own tributaries. Arizona agreed to the Governors' proposal, but she wanted it made clear that her tributaries were to be exempted from any Mexican obligation.[43] California rejected the whole proposal, insisting that she must have 4,600,000 acre-feet from the mainstream, or, as she put it, "from the waters to be provided by the States of the upper division at Lee Ferry under the Colorado River compact."[44] Neither in the States' original offers, nor in the Governors' suggestions, nor in the States' responses was the "Colorado River System"—mainstream plus tributaries—ever used as the basis for Lower Basin allocations; rather, it was always mainstream water, or the water to be delivered by the upper States at Lee Ferry, that is to say, an annual average of 7,500,000 acre-feet of mainstream water.

With the continued failure of Arizona and California to reach accord, there was mounting impetus for a congressional solution. A Swing-Johnson bill containing no limitation on California's uses finally passed the House in 1928 over objections by Representatives from Arizona and Utah.[45] When the bill reached the Senate, it was amended in committee to provide that the Secretary in his water delivery contracts must limit California to 4,600,000 acre-feet "of the water allocated to the lower basin by the Colorado River compact . . . and one-half of the unallocated, excess, and/or surplus water . . . ."[46] On the floor, Senator Phipps of Colorado proposed an amendment which would allow the Act to go into effect without any limitation on California if seven States ratified the Compact; if only six States ratified and if the California Legislature accepted the limitation, the Act could still become effective.[47] Arizona's Senator Hayden had already proposed an amendment reducing California's share to 4,200,000 acre-feet (the Governors' proposal), plus half of the surplus, leaving Arizona exclusive use of the Gila free from any Mexican obligation,[48] but this the Senate rejected.[49] Senator Bratton of New Mexico, noting that only 400,000 acre-feet kept Arizona and California apart, immediately suggested an amendment by which they would split the difference, California getting 4,400,000 acre-feet "of the waters apportioned to the lower basin States by the Colorado River compact," plus half of the surplus.[50] It was this Bratton amendment that became part of the Act as passed,[51] which had been amended on the floor so that the limitation referred to waters apportioned to the

[41] See 69 Cong. Rec. 9454 (1928).
[42] See 70 Cong. Rec. 172 (1928).
[43] Hearings on H. R. 5773, *supra* note 25, at 30-31.
[44] *Id.*, at 402.
[45] H. R. 5773, 70th Cong., 1st Sess.; 69 Cong. Rec. 9989-9990 (1928).
[46] S. Rep. No. 592, 70th Cong., 1st Sess. 2 (1928).
[47] 70 Cong. Rec. 324 (1928).
[48] *Id.*, at 162.
[49] *Id.*, at 384.
[50] *Id.*, at 385.
[51] 45 Stat. 1057 (1928). Arizona's Senators Ashurst and Hayden voted against the bill, which did not exempt the Gila from the Mexican burden. 70 Cong. Rec. 603 (1928).

Lower Basin "by paragraph (a) of Article III of the Colorado River compact," instead of waters apportioned "by the Colorado River compact."[52]

Statements made throughout the debates make it quite clear that Congress intended the 7,500,000 acre-feet it was allocating, and out of which California was limited to 4,400,000, to be mainstream water only. In the first place, the basin Senators expressly acknowledged as the starting point for their debate the Denver Governor's proposal that specific allocations be made to Arizona, California, and Nevada from the mainstream, leaving the tributaries to the States. For example, Senator Johnson, leading spokesman for California, and Senator Hayden, leading spokesman for Arizona, agreed that the Governors' recommendations could be used as "a basis for discussion."[53] Hayden went on to observe that the Committee amendment would give California the same 4,600,000 acre-feet she had sought at Denver.[54] Later, Nevada's Senator Pittman stated that the committee "put the amount in there that California demanded before the four governors at Denver," and said that the Bratton amendment would split the 400,000 acre-feet separating the Governors' figure and the Committee's figure.[55] All the leaders in the debate—Johnson, Bratton, King, Hayden, Phipps, and Pittman—expressed a common understanding that the key issue separating Arizona and California was the difference of 400,000 acre-feet,[56] precisely the same 400,000 acre-feet of mainstream water that had separated the States at Denver. Were we to sustain California's argument here that tributaries must be included, California would actually get more than she was willing to settle for at Denver.

That the apportionment was from the mainstream only is also strongly indicated by an analysis of the second paragraph of § 4 (a) of the Act. There Congress authorized Arizona, Nevada, and California to make a compact allocating to Nevada 300,000 acre-feet and to Arizona 2,800,000 plus one-half of the surplus, which, with California's 4,400,000 and half of the surplus, would under California's interpretation of the Act exhaust the Lower Basin waters, both mainstream and tributaries. But Utah and New Mexico, as Congress knew, had interests in Lower Basin tributaries which Congress surely would have protected in some way had it meant for the tributaries of those two States to be included in the water to be divided among Arizona, Nevada, and California. We cannot believe that Congress would have permitted three States to divide among themselves water belonging to five States. Nor can we believe that the representatives of Utah and New Mexico would have sat quietly by and acquiesced in a congressional attempt to include their tributaries in waters given the other three States.

Finally, in considering California's claim to share in the tributaries of other States, it is important that from the beginning of the discussions and negotiations which led to the Project Act, Arizona consistently claimed that she must have sole use of the Gila, upon which her existing economy depended.[57] Arizona's claim was supported by the fact that only she and New Mexico could effectively use the Gila waters, which not only entered the Colorado River too close to Mexico to be of much use to any other State but also was reduced virtually to a trickle in the hot Arizona summers before it could reach the Colorado. In the debates the Senators consistently acknowledged that the tributaries—or at least the waters of the Gila, the only major Arizona tributary—were excluded from the allocation they were making. Senator Hayden, in response to questions by Senator Johnson, said that the California Senator was correct in stating that the Senate had seen fit to give Arizona 2,800,000 acre-feet in addition to all the water in the Gila.[58] Senator Johnson had earlier stated, "[I]t is only the main stream, Senators will recall, that has been discussed," and one of his arguments in favor of California's receiving 4,600,000 acre-feet rather than 4,200,000 was that Arizona was going to keep all her tributaries in addition to whatever portion of the main river was allocated to her.[59] Senator Johnson also

[52]70 Cong. Rec. 459 (1928). That this change was not intended to cause the States to give up their tributaries may reasonably be inferred from the fact that the amendment was agreed to by Senator Hayden, who was a constant opponent of including the tributaries.

[53]*Id.*, at 77.

[54]*Ibid.* Later, Senator Hayden said that his amendment incorporated the Governors' proposal. *Id.*, at 172-173.

[55]*Id.*, at 386.

[56]*Id.*, at 164 (King), 165 (Johnson, Bratton), 382 (Hayden, Phipps), 385 (Bratton), 386 (Pittman). Senator Hayden's statement is representative: "I want to state to the Senate that what I am trying to accomplish is to get a vote on the one particular question of whether the quantity of water which the State of California may divert from the Colorado River should be 4,200,000 acre-feet or 4,600,000 acre-feet." *Id.*, at 382.

[57]E.g., Report, Colorado River Commission of Arizona (1927), reprinted in Hearings on H. R. 5773, *supra* note 25, at 25-31; 69 Cong. Rec. 9454 (1928) (Arizona's proposal at Denver).

[58]70 Cong. Rec. 467-468 (1928). See also *id.*, at 463-464, 465.

[59]*Id.*, at 237.

argued that Arizona should bear more than half the Lower Basin's Mexican burden because in addition to the 2,800,000 acre-feet allotted her by the Act she would get the Gila, which he erroneously estimated at 3,500,000 acre-feet.[60] Senator Pittman, who had sat in on the Governors' conference, likewise understood that the water was being allocated from "the main Colorado River."[61] And other interested Senators similarly distinguished between the mainstream and the tributaries.[62] While the debates, extending over a long period of years, undoubtedly contain statements which support inferences in conflict with those we have drawn, we are persuaded by the legislative history as a whole that the Act was not intended to give California any claim to share in the tributary waters of the other Lower Basin States.

C. *The Project Act's Apportionment and Distribution Scheme.*—The legislative history, the language of the Act, and the scheme established by the Act for the storage and delivery of water convince us also that Congress intended to provide its own method for a complete apportionment of the mainstream water among Arizona, California, and Nevada.

First, the legislative history. In hearings on the House bill that became the Project Act, Congressman Arentz of Nevada, apparently impatient with the delay of this much needed project, told the committee on January 6, 1928, that if the States could not themselves allocate the water, "there must be some power which will say to California 'You can not take any more than this amount and the balance is allocated to the other States.' "[63] Later, May 25, 1928, the House passed the bill,[64] but it did not contain any allocation scheme. When the Senate took up that bill in December, pressure mounted swiftly for amendments that would provide a workable method for apportioning the waters among the Lower Basin States and distributing them to users in the States. The session convened on December 3, 1928, on the fifth the Senate took up the bill,[65] nine days later the bill with significant amendments passed the Senate,[66] four days after that the House concurred in the Senate's action,[67] and on the twenty-first the President signed the bill.[68] When the bill first reached the Senate floor, it had a provision, added in committee, limiting California to 4,600,000 acre-feet,[69] and Senator Hayden on December 6 proposed reducing that share to 4,200,000.[70] The next day, December 7, Mr. Pittman, senior Senator from Nevada, vigorously argued that Congress should settle the matter without delay. He said,

> "What is the difficulty? We have only minor questions involved here. There is practically nothing involved except a dispute between the States of Arizona and California with regard to the division of the increased water that will be impounded behind the proposed dam; that is all. . . . Of the 7,500,000 acre-feet of water let down that river they have gotten together within 400,000 acre-feet. They have got to get together, and if they do not get together Congress should bring them together."[71]

The day after that, December 8, New Mexico's Senator Bratton suggested an amendment splitting the difference between the demands of Arizona and California by limiting California to 4,400,000 acre-feet.[72] On the tenth, reflecting the prevailing sense of urgency for decisive action, Senator Bratton emphasized that this was not a dispute limited simply to two States:

> "The two States have exchanged views, they have negotiated, they have endeavored to reach an agreement, and until now have been unable to do so. This controversy does not affect those two States alone. It affects other States in the Union and the Government as well.

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[60] *Id.*, at 466-467.
[61] *Id.*, at 469. See also *id.*, at 232.
[62] See *id.*, at 463 (Shortridge); *id.*, at 465 (King).
[63] Hearings on H. R. 5773, *supra* note 25, at 50.
[64] 69 Cong. Rec. 9990 (1928).
[65] 70 Cong. Rec. 67 (1928).
[66] *Id.*, at 603.
[67] *Id.*, at 837-838.
[68] 45 Stat. 1057.
[69] See S. Rep. No. 592, 70th Cong., 1st Sess. 2 (1928).
[70] 70 Cong. Rec. 162 (1928).
[71] *Id.*, at 232.
[72] *Id.*, at 277, 385.

"Without undertaking to express my views either way upon the subject, I do think that if the two States are unable to agree upon a figure then that we, as a disinterested and friendly agency, should pass a bill which, according to our combined judgment, will justly and equitably settle the controversy. I suggested 4,400,000 acre-feet with that in view. I still hold to the belief that somewhere between the two figures we must fix the amount, and that this difference of 400,000 acre-feet should not be allowed to bar and preclude the passage of this important measure dealing with the enormous quantity of 15,000,000 acre-feet of water and involving seven States as well as the Government."[73]

The very next day, December 11, this crucial amendment was adopted,[74] and on the twelfth Senator Hayden pointed out that the bill settled the dispute over Lower Basin waters by giving 4,400,000 acre-feet to California and 2,800,000 to Arizona:

"One [dispute] is how the seven and a half million acre-feet shall be divided in the lower basin. The Senate has settled that by a vote—that California may have 4,400,000 acre-feet of that water. It follows logically that if that demand is to be conceded, as everybody agrees, the remainder is 2,800,000 acre-feet for Arizona. That settles that part of the controversy."[75]

On the same day, Senator Pittman, intimately familiar with the whole water problem,[76] summed up the feeling of the Senate that the bill fixed a limit on California and "practically allocated" to Arizona her share of the water:

"The Senate has already determined upon the division of water between those States. How? It has determined how much water California may use, and the rest of it is subject to use by Nevada and Arizona. Nevada has already admitted that it can use only an insignificant quantity, 300,000 acre-feet. That leaves the rest of it to Arizona. As the bill now stands it is just as much divided as if they had mentioned Arizona and Nevada and the amounts they are to get . . . .

"As I understand this amendment, Arizona to-day has practically allocated to it 2,800,000 acre-feet of water in the main Colorado River."[77]

The Senator went on to explain why the Senate had found it necessary to set up his own plan for allocating the water:

"Why do we not leave it to California to say how much water she shall take out of the river or leave it to Arizona to say how much water she shall take out of the river? It is because it happens to become a duty of the United States Senate to settle this matter, and that is the reason."[78]

Not only do the closing days of the debate show that Congress intended an apportionment among the States but also provisions of the Act create machinery plainly adequate to accomplish this purpose, whatever contingencies might occur. As one alternative of the congressional scheme, § 4 (a) of the Act invited Arizona, California, and Nevada to adopt a compact dividing the waters along the identical lines that had formed the basis for the congressional discussions of the Act: 4,400,000 acre-feet to California, 300,000 to Nevada, and

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[73] *Id.*, at 333.

[74] *Id.*, at 387.

[75] *Id.*, at 467. See also *id.*, at 465.

[76] For example, Senator Pittman's active role in resolving the whole Colorado River problem was acknowledged by Senator Hayden on the Senate floor:

"When Congress assembled in December, 1927, no agreement had been made. The senior Senator from Nevada [MR. PITTMAN], in continuation of the earnest efforts that he has made all these years to bring about a settlement of the controversy between the States with respect to the Colorado River, invited a number of us to conferences in his office and there we talked over the situation." *Id.*, at 172.

[77] *Id.*, at 468-469.

[78] *Id.*, at 471. The Senator added, "We have already decided as to the division of the water, and we say that if the States wish they can enter into a subsidiary agreement confirming that." *Ibid.*

2,800,000 to Arizona. Section 8 (b) gave the States power to agree upon some other division, which would have to be approved by Congress. Congress made sure, however, that if the States did not agree on any compact the objects of the Act would be carried out, for the Secretary would then proceed, by making contracts, to apportion water among the States and to allocate the water among users within each State.

In the first section of the Act, the Secretary was authorized to "construct, operate, and maintain a dam and incidental works . . . adequate to create a storage reservoir of a capacity of not less than twenty million acre-feet of water . . ." for the stated purpose of "controlling the floods, improving navigation and regulating the flow of the Colorado River, providing for storage and for the delivery of the stored waters thereof for reclamation of public lands and other beneficial uses . . .," and generating electrical power. The whole point of the Act was to replace the erratic, undependable, often destructive natural flow of the Colorado with the regular, dependable release of waters conserved and stored by the project. Having undertaken this beneficial project, Congress, in several provisions of the Act, made it clear that no one should use mainstream waters save in strict compliance with the scheme set up by the Act. Section 5 authorized the Secretary "under such general regulations as he may prescribe, to contract for the storage of water in said reservoir and for the delivery thereof at such points on the river . . . as may be agreed upon, for irrigation and domestic uses . . . ." To emphasize that water could be obtained from the Secretary alone, § 5 further declared, "No person shall have or be entitled to have the use for any purpose of the water stored as aforesaid except by contract made as herein stated." The supremacy given the Secretary's contracts was made clear in § 8 (b) of the Act, which provided that, while the Lower Basin States were free to negotiate a compact dividing the waters, such a compact if made and approved after January 1, 1929, was to be "subject to all contracts, if any, made by the Secretary of the Interior under section 5" before Congress approved the compact.

These several provisions, even without legislative history, are persuasive that Congress intended the Secretary of the Interior, through his § 5 contracts, both to carry out the allocation of the waters of the main Colorado River among the Lower Basin States and to decide which users within each State would get water. The general authority to make contracts normally includes the power to choose with whom and upon what terms the contracts will be made. When Congress in an Act grants authority to contract, that authority is no less than the general authority, unless Congress has placed some limit on it.[79] In this respect it is of interest that in an earlier version the bill did limit the Secretary's contract power by making the contracts "subject to rights of prior appropriators."[80] But that restriction, which preserved the law of prior appropriation, did not survive. It was stricken from the bill when the requirement that every water user have a contract was added to § 5.[81] Significantly, no phrase or provision indicating that the Secretary's contract power was to be controlled by the law of prior appropriation was substituted either then or at any other time before passage of the Act, and we are persuaded that had Congress intended so to fetter the Secretary's discretion, it would have done so in clear and unequivocal terms, as it did in recognizing "present perfected rights" in § 6.

That the bill was giving the Secretary sufficient power to carry out an allocation of the waters among the States and among the users within each State without regard to the law of prior appropriation was brought out in a colloquy between Montana's Senator Walsh and California's Senator Johnson, whose State had at least as much reason as any other State to bind the Secretary by state laws. Senator Walsh, who was thoroughly versed in western water law and also had previously argued before this Court in a leading case involving the doctrine of prior appropriation,[82] made clear what would follow from the Government's impounding of the Colorado River waters when he said, "I always understood that the interest that stores the water has a right superior to prior appropriations that do not store." He sought Senator Johnson's views on what rights the City of Los Angeles, which had filed claims to large quantities of Colorado River water, would have after the Government had built the dam and impounded the waters. In reply to Senator Walsh's specific question whether the Government might "dispose of the stored water as it sees fit," Senator Johnson said,

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[79]In the debates leading to the passage of the bill, Senator Walsh observed that "to contract means a liberty of contract" and asked if this did not mean that the Secretary could "give the water to them [appropriators] or withhold it from them as he sees fit," to which Senator Johnson answered "certainly." 70 Cong. Rec. 168 (1928).

[80]See Hearings on H. R. 6251 and 9826 before the Committee on Irrigation and Reclamation, 69th Cong., 1st Sess. 12 (1926).

[81]See *id.*, at 97, 115.

[82]*Bean* v. *Morris*, 221 U.S. 485 (1911). This case was relied on by Mr. Justice Van Devanter in *Wyoming* v. *Colorado*, 259 U.S. 419, 466 (1922).

"Yes; under the terms of this bill." Senator Johnson added that "everything in this scheme, plan, or design" was "dependent upon the Secretary of the Interior contracting with those who desire to obtain the benefit of the construction . . . ." He admitted that it was possible that the Secretary could "utterly ignore" Los Angeles' appropriations.[83]

In this same discussion, Senator Hayden emphasized the Secretary's power to allocate the water by making contracts with users. After Senator Walsh said that he understood Senator Johnson to be arguing that the Secretary must satisfy Los Angeles' appropriations, Senator Hayden corrected him, pointing out that Senator Johnson had qualified his statement by saying that "after all, the Secretary of the Interior could allow the city of Los Angeles to have such quantity of water as might be determined by contract." Senator Hayden went on to say that, where domestic and irrigation needs conflicted, "the Secretary of the Interior will naturally decide as between applicants, one who desires to use the water for potable purposes in the city and another who desires to use it for irrigation, if there is not enough water to go around, that the city shall have the preference."[84] It is also significant that two vigorous opponents of the bill, Arizona's Representative Douglas and Utah's Representative Colton, criticized the bill because it gave the Secretary of the Interior "absolute control" over the disposition of the stored waters.[85]

The argument that Congress would not have delegated to the Secretary so much power to apportion and distribute the water overlooks the ways in which his power is limited and channeled by standards in the Project Act. In particular, the Secretary is bound to observe the Act's limitation of 4,400,000 acre-feet on California's consumptive uses out of the first 7,500,000 acre-feet of mainstream water. This necessarily leaves the remaining 3,100,000 acre-feet for the use of Arizona and Nevada, since they are the only other States with access to the main Colorado River. Nevada consistently took the position, accepted by the other States throughout the debates, that her conceivable needs would not exceed 300,000 acre-feet, which, of course, left 2,800,000 acre-feet for Arizona's use. Moreover, Congress indicated that it thought this a proper division of the waters when in the second paragraph of § 4 (a) it gave advance consent to a tri-state compact adopting such division. While no such compact was ever entered into, the Secretary by his contracts has apportioned the water in the approved amounts and thereby followed the guidelines set down by Congress. And, as the Master pointed out, Congress set up other standards and placed other significant limitations upon the Secretary's power to distribute the stored waters. It specifically set out in order the purposes for which the Secretary must use the dam and the reservoir:

> "First, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and satisfaction of present perfected rights in pursuance of Article VIII of said Colorado River compact; and third, for power." § 6.

The Act further requires the Secretary to make revenue provisions in his contracts adequate to ensure the recovery of the expenses of construction, operation, and maintenance of the dam and other works within 50 years after their construction. § 4 (b). The Secretary is directed to make water contracts for irrigation and domestic uses only for "permanent service." §5. He and his permittees, licensees, and contractees are subject

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[83]70 Cong. Rec. 168 (1928). Other statements by Senator Johnson are less damaging to California's claims. For example, the Senator at another point in the colloquy with Senator Walsh said that he doubted if the Secretary either would or could disregard Los Angeles and contract with someone having no appropriation. *Ibid.* It is likely, however, that Senator Johnson was talking about present perfected rights, as a few minutes before he had argued that Los Angeles had taken sufficient steps in perfecting its claims to make them protected. See *id.*, at 167. Present perfected rights, as we have observed in the text, are recognized by the Act. § 6.

[84]70 Cong. Rec. 169 (1928). At one point Senator Hayden seems to say that the Secretary's contracts are to be governed by state law: "The only thing required in this bill is contained in the amendment that I have offered, that there shall be apportioned to each State its share of the water. Then, who shall obtain that water in relative order of priority may be determined by the State courts." *Ibid.* But, in view of the Senator's other statements in the same debate, this remark of a man so knowledgeable in western water law makes sense only if one understands that the "order of priority" being talked about was the order of present perfected rights—rights which Senator Hayden recognized, see *id.*, at 167, and which the Act preserves in § 6.

[85]69 Cong. Rec. 9623, 9648, 9649 (1928). We recognize, of course, that statements of opponents of a bill may not be authoritative, see *Schwegmann Bros.* v. *Calvert Distillers Corp.*, 341 U.S. 384, 394-395 (1951), but they are nevertheless relevant and useful, especially where, as here, the proponents of the bill made no response to the opponents' criticisms.

to the Colorado River Compact, § 8 (a), and therefore can do nothing to upset or encroach upon the Compact's allocation of Colorado River water between the Upper and Lower Basins. In the construction, operation, and management of the works, the Secretary is subject to the provisions of the reclamation law, except as the Act otherwise provides. § 14. One of the most significant limitations in the Act is that the Secretary is required to satisfy present perfected rights, a matter of intense importance to those who had reduced their water rights to actual beneficial use at the time the Act became effective. § 6. And, of course, all of the powers granted by the Act are exercised by the Secretary and his well-established executive department, responsible to Congress and the President and subject to judicial review.[86]

Notwithstanding the Government's construction, ownership, operation, and maintenance of the vast Colorado River works that conserve and store the river's waters and the broad power given by Congress to the Secretary of the Interior to make contracts for the distribution of the water, it is argued that Congress in §§ 14 and 18 of the Act took away practically all the Secretary's power by permitting the States to determine with whom and on what terms the Secretary would make water contracts. Section 18 states:

> "Nothing herein shall be construed as interfering with such rights as the States now have either to the waters within their borders or to adopt such policies and enact such laws as they may deem necessary with respect to the appropriation, control, and use of waters within their borders . . . ."

Section 14 provides that the reclamation law, to which the Act is made a supplement, shall govern the management of the works except as otherwise provided, and § 8 of the Reclamation Act, much like § 18 of the Project Act, provides that it is not to be construed as affecting or interfering with state laws "relating to the control, appropriation, use, or distribution of water used in irrigation . . . ."[87] In our view, nothing in any of these provisions affects our decision, stated earlier, that it is the Act and the Secretary's contracts, not the law of prior appropriation, that control the apportionment of water among the States. Moreover, contrary to the Master's conclusion, we hold that the Secretary in choosing between users within each State and in settling the terms of his contracts is not bound by these sections to follow state law.

The argument that § 8 of the Reclamation Act requires the United States in the delivery of water to follow priorities laid down by State law has already been disposed of by this Court in *Ivanhoe Irr. Dist.* v. *McCracken*, 357 U.S. 275 (1958) and reaffirmed in *City of Fresno* v. *California*, 372 U.S. 627 (1963). In *Ivanhoe* we held that, even though § 8 of the Reclamation Act preserved state law, that general provision could not override a specific provision of the same Act prohibiting a single landowner from getting water for more than 160 acres. We said:

> "As we read § 8, it merely requires the United States to comply with state law when, in the construction and operation of a reclamation project, it becomes necessary for it to acquire water rights or vested interests therein. But the acquisition of water rights must not be confused with the operation of federal projects. As the Court said in *Nebraska* v. *Wyoming, supra*, at 615: 'We do not suggest that where Congress has provided a system of regulation for federal projects it must give way before an inconsistent state system'. . . . We read nothing in § 8 that compels the United States to deliver water on conditions imposed by the State." *Id.*, at 291-292.

Since § 8 of the Reclamation Act did not subject the Secretary to state law in disposing of water in that case, we cannot, consistently with *Ivanhoe*, hold that the Secretary must be bound by state law in disposing of water under the Project Act.

Nor does § 18 of the Project Act require the Secretary to contract according to state law. That Act was passed in the exercise of congressional power to control navigable water for purposes of flood control,

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[86] See, *e.g.*, *Ickes* v. *Fox*, 300 U.S. 82 (1937); *cf. Best* v. *Humboldt Placer Mining Co.*, 371 U.S. 334 (1963); *Boesche* v. *Udall, ante*, p. 472.

[87] "Nothing in . . . [this Act] shall be construed as affecting or intended to affect or to in any way interfere with the laws of any State or Territory relating to the control, appropriation, use, or distribution of water used in irrigation, or any vested right acquired thereunder, and the Secretary of the Interior, in carrying out the provisions of such sections, shall proceed in conformity with such laws, and nothing . . . [herein] shall in any way affect any right of any State or of the Federal Government or of any landowner, appropriator, or user of water in, to, or from any interstate stream or the waters thereof." 43 U.S.C. § 383.

navigation, power generation, and other objects,[88] and is equally sustained by the power of Congress to promote the general welfare through projects for reclamation, irrigation, or other internal improvements.[89] Section 18 merely preserves such rights as the States "now" have, that is, such rights as they had at the time the Act was passed. While the States were generally free to exercise some jurisdiction over these waters before the Act was passed, this right was subject to the Federal Government's right to regulate and develop the river.[90] Where the Government, as here, has exercised this power and undertaken a comprehensive project for the improvement of a great river and for the orderly and beneficial distribution of water, there is no room for inconsistent state laws.[91] As in *Ivanhoe*, where the general provision preserving state law was held not to override a specific provision stating the terms for disposition of the water, here we hold that the general saving language of § 18 cannot bind the Secretary by state law and thereby nullify the contract power expressly conferred upon him by § 5.[92] Section 18 plainly allows the States to do things not inconsistent with the Project Act or with federal control of the river, for example, regulation of the use of tributary water and protection of present perfected rights.[93] What other things the States are free to do can be decided when the occasion arises. But where the Secretary's contracts, as here, carry out a congressional plan for the complete distribution of waters to users, state law has no place.[94]

Before the Project Act was passed, the waters of the Colorado River, though numbered by the millions of acre-feet, flowed too haltingly or too freely resulting in droughts and floods. The problems caused by these conditions proved too immense and the solutions too costly for any one State or all the States together. In addition, the States, despite repeated efforts at a settlement, were unable to agree on how much water each State should get. With the health and growth of the Lower Basin at stake, Congress responded to the pleas of the States to come to their aid. The result was the Project Act and the harnessing of the bountiful waters of the Colorado to sustain growing cities, to support expanding industries, and to transform dry and barren deserts into lands that are livable and productive.

In undertaking this ambitious and expansive project for the welfare of the people of the Lower Basin States and of the Nation, the United States assumed the responsibility for the construction, operation, and supervision of Boulder Dam and a great complex of other dams and works. Behind the dam were stored virtually all the waters of the main river, thus impounding not only the natural flow but also the great quantities of water previously allowed to run waste or to wreak destruction. The impounding of these waters, along with their regulated and systematic release to those with contracts, has promoted the spectacular development of the Lower Basin. Today, the United States operates a whole network of useful projects up and down the river, including the Hoover Dam, Davis Dam, Parker Dam, Headgate Rock Dam, Palo Verde Dam, Imperial Dam, Laguna Dam, Morelos Dam, and the All-American Canal System, and many lesser works. It was only natural that the United States, which was to make the benefits available and which had accepted the responsibility for the project's operation, would want to make certain that the waters were effectively used. All this vast, interlocking machinery—a dozen major works delivering water according to congressionally fixed priorities for home, agricultural, and industrial uses to people spread over thousands of square miles—could function effeciently only under unitary management, able to formulate and supervise a coordinated plan that could take account of the diverse, often conflicting interests of the people and communities of the Lower Basin States. Recognizing this, Congress put the Secretary of the Interior in charge of these works and entrusted him with

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[88] *Arizona* v. *California*, 283 U.S. 423 (1931).

[89] *United States* v. *Gerlach Live Stock Co.*, 339 U.S. 725, 738 (1950).

[90] *First Iowa Hydro-Elec. Coop.* v. *Federal Power Comm'n*, 328 U.S. 152, 171 (1946). See *United States* v. *Chandler-Dunbar Water Power Co.*, 229 U.S. 53, 62-72 (1913); *United States* v. *Willow River Power Co.*, 324 U.S. 499 (1945).

[91] See *Arizona* v. *California*, 283 U.S. 423 (1931); *Nebraska* v. *Wyoming*, 325 U.S. 589, 615 (1945); *First Iowa Hydro-Elec. Coop.* v. *Federal Power Comm'n*, 328 U.S. 152 (1946).

[92] *Nebraska* v. *Wyoming*, 325 U.S. 589 (1945), holds nothing to the contrary. There the Court found it unnecessary to decide what rights the United States had under federal law to the unappropriated water of the North Platte River, since the water rights on which the projects in that case rested had in fact been obtained in compliance with state law.

[93] See *First Iowa Hydro-Elec. Coop.* v. *Federal Power Comm'n*, 328 U.S. 152, 175-176 (1946), where this Court limited the effect of § 27 of the Federal Power Act, which expressly "saved" certain state laws, to vested property rights.

[94] By an Act of September 2, 1958, 72 Stat. 1726, the Secretary must supply water to Boulder City, Nevada. It follows from our conclusions as to the inapplicability of state law that, contrary to the Master's conclusion, Boulder City's priorities are not to be determined by Nevada law.

sufficient power, principally the § 5 contract power, to direct, manage, and coordinate their operation. Subjecting the Secretary to the varying, possibly inconsistent, commands of the different state legislatures could frustrate efficient operation of the project and thwart full realization of the benefits Congress intended this national project to bestow. We are satisfied that the Secretary's power must be construed to permit him, within the boundaries set down in the Act, to allocate and distribute the waters of the mainstream of the Colorado River.

II.

PROVISIONS IN THE SECRETARY'S CONTRACTS.

A. *Diversions above Lake Mead.*—The Secretary's contracts with Arizona and Nevada provide that any waters diverted by those States out of the mainstream or the tributaries above Lake Mead must be charged to their respective Lower Basin apportionments. The Master, however, took the view that the apportionment was to be made out of the waters actually stored at Lake Mead or flowing in the mainstream below Lake Mead. He therefore held that the Secretary was without power to charge Arizona and Nevada for diversions made by them from the 275-mile stretch of river between Lee Ferry and Lake Mead[95] or from the tributaries above Lake Mead. This conclusion was based on the Master's reasoning that the Secretary was given physical control over the waters stored in Lake Mead and not over waters before they reached the lake.

We hold that the Master was correct in deciding that the Secretary cannot reduce water deliveries to Arizona and Nevada by the amount of their uses from tributaries above Lake Mead, for, as we have held, Congress in the Project Act intended to apportion only the mainstream, leaving to each State its own tributaries. We disagree, however, with the Master's holding that the Secretary is powerless to charge States for diversions from the mainstream above Lake Mead. What Congress was doing in the Project Act was providing for an apportionment among the Lower Basin States of the water allocated to that basin by the Colorado River Compact. The Lower Basin, with which Congress was dealing, begins at Lee Ferry, and it was all the water in the mainstream below Lee Ferry that Congress intended to divide among the States. Were we to refuse the Secretary the power to charge States for diversions from the mainstream between Lee Ferry and the damsite, we would allow individual States, by making diversions that deplete the Lower Basin's allocation, to upset the whole plan of apportionment arrived at by Congress to settle the long-standing dispute in the Lower Basin. That the congressional apportionment scheme would be upset can easily be demonstrated. California, for example, has been allotted 4,400,000 acre-feet of mainstream water. If Arizona and Nevada can, without being charged for it, divert water from the river above Lake Mead, then California could not get the share Congress intended her to have.

B. *Nevada Contract.*—Nevada has excepted to her inclusion in Paragraph II (B) (7) of the Master's recommended decree, which provides that "mainstream water shall be delivered to users in Arizona, California and Nevada only if contracts have been made by the Secretary of the Interior, pursuant to Section 5 of the Boulder Canyon Project Act, for delivery of such water." While the California contracts are directly with water users and the Arizona contract specifically contemplates further subcontracts with actual users, it is argued that the Nevada contract, made by the Secretary directly with the State of Nevada through her Colorado River Commission, should be construed as a contract to deliver water to the State without the necessity of subcontracts by the Secretary directly with Nevada water users. The United States disagrees, contending that properly construed the Nevada contract, like the Secretary's general contract with Arizona, does not exhaust the Secretary's power to require Nevada water users other than the State to make further contracts. To construe the Nevada contract otherwise, the Government suggests, would bring it in conflict with the provision of § 5 of the Project Act that "No person shall have or be entitled to have the use for any purpose of the water stored as aforesaid except by contract [with the Secretary] made as herein stated." Acceptance of Nevada's contention here would not only undermine this plain congressional requirement that water users have contracts with the Secretary but would likewise transfer from the Secretary to Nevada a large part, if not

[95]The location of Hoover Dam is a result of engineering decisions. As Senator Pittman pointed out, "There is no place to impound the flood waters except at the lower end of the canyon." 68 Cong. Rec. 4413 (1927).

all, of the Secretary's power to determine with whom he will contract and on what terms. We have already held that the contractual power granted the Secretary cannot be diluted in this manner. We therefore reject Nevada's contention.

III.

APPORTIONMENT AND CONTRACTS IN TIME OF SHORTAGE

We have agreed with the Master that the Secretary's contracts with Arizona for 2,800,000 acre-feet of water and with Nevada for 300,000, together with the limitation of California to 4,400,000 acre-feet, effect a valid apportionment of the first 7,500,000 acre-feet of mainstream water in the Lower Basin. There remains the question of what shall be done in time of shortage. The Master, while declining to make any findings as to what future supply might be expected, nevertheless decided that the Project Act and the Secretary's contracts require the Secretary in case of shortage to divide the burden among the three States in this proportion: California $\frac{4.4}{7.5}$: Arizona $\frac{2.8}{7.5}$; Nevada $\frac{.3}{7.5}$. While pro rata sharing of water shortages seems equitable on its face,[96] more considered judgment may demonstrate quite the contrary. Certainly we should not bind the Secretary to this formula. We have held that the Secretary is vested with considerable control over the apportionment of Colorado River waters. And neither the Project Act nor the water contracts require the use of any particular formula for apportioning shortages. While the Secretary must follow the standards set out in the Act, he nevertheless is free to choose among the recognized methods of apportionment or to devise reasonable methods of his own. This choice, as we see it, is primarily his, not the Master's or even ours. And the Secretary may or may not conclude that a pro rata division is the best solution.

It must be remembered that the Secretary's decision may have an effect not only on irrigation uses but also on other important functions for which Congress brought this great project into being—flood control, improvement of navigation, regulation of flow, and generation and distribution of electric power. Requiring the Secretary to prorate shortages would strip him of the very power of choice which we think Congress, for reasons satisfactory to it, vested in him and which we should not impair or take away from him. For the same reasons we cannot accept California's contention that in case of shortage each State's share of water should be determined by the judicial doctrine of equitable apportionment or by the law of prior appropriation. These principles, while they may provide some guidance, are not binding upon the Secretary where, as here, Congress, with full power to do so, has provided that the waters of a navigable stream shall be harnessed, conserved, stored, and distributed through a government agency under a statutory scheme.

None of this is to say that in case of shortage, the Secretary cannot adopt a method of proration or that he may not lay stress upon priority of use, local laws and customs, or any other factors that might be helpful in reaching an informed judgment in harmony with the Act, the best interests of the Basin States, and the welfare of the Nation. It will be time enough for the courts to intervene when and if the Secretary, in making apportionments or contracts, deviates from the standards Congress has set for him to follow, including his obligation to respect "present perfected rights" as of the date the Act was passed. At this time the Secretary has made no decision at all based on an actual or anticipated shortage of water, and so there is no action of his in this respect for us to review. Finally, as the Master pointed out, Congress still has broad powers over this navigable international stream. Congress can undoubtedly reduce or enlarge the Secretary's power if it wishes. Unless and until it does, we leave in the hands of the Secretary, where Congress placed it, full power to control, manage, and operate the Government's Colorado River works and to make contracts for the sale and delivery of water on such terms as are not prohibited by the Project Act.

[96]Proration of shortage is the method agreed upon by the United States and Mexico to adjust Mexico's share of Colorado River water should there be insufficient water to supply each country's apportionment.

IV.

ARIZONA-NEW MEXICO GILA CONTROVERSY.

Arizona and New Mexico presented the Master with conflicting claims to water in the Gila River, the tributary that rises in New Mexico and flows through Arizona. Having determined that tributaries are not within the regulatory provisions of the Project Act the Master held that this interstate dispute should be decided under the principles of equitable apportionment. After hearing evidence on this issue, the Master accepted a compromise settlement agreed upon by these States and incorporated that settlement in his findings and conclusions, and in Part IV (A) (B) (C) (D) of his recommended decree. No exceptions have been filed to these recommendations by any of the parties and they are accordingly accepted by us. Except for those discussed in Part V, we are not required to decide any other disputes between tributary users or between mainstream and tributary users.

V.

CLAIMS OF THE UNITED STATES.

In these proceedings, the United States has asserted claims to waters in the main river and in some of the tributaries for use on Indian Reservations, National Forests, Recreational and Wildlife Areas and other government lands and works. While the Master passed upon some of these claims, he declined to reach others, particularly those relating to tributaries. We approve his decision as to which claims required adjudication, and likewise we approve the decree he recommended for the government claims he did decide. We shall discuss only the claims of the United States on behalf of the Indian Reservations.

The Government, on behalf of five Indian Reservations in Arizona, California, and Nevada, asserted rights to water in the mainstream of the Colorado River.[97] The Colorado River Reservation, located partly in Arizona and partly in California, is the largest. It was originally created by an Act of Congress in 1865,[98] but its area was later increased by Executive Order.[99] Other reservations were created by Executive Orders and amendments to them, ranging in dates from 1870 to 1907.[100] The Master found both as a matter of fact and law that when the United States created these reservations or added to them, it reserved not only land but also the use of enough water from the Colorado to irrigate the irrigable portions of the reserved lands. The aggregate quantity of water which the Master held was reserved for all the reservations is about 1,000,000 acre-feet, to be used on around 135,000 irrigable acres of land. Here, as before the Master, Arizona argues that the United States had no power to make a reservation of navigable waters after Arizona became a State; that navigable waters could not be reserved by Executive Orders; that the United States did not intend to reserve water for the Indian Reservations; that the amount of water reserved should be measured by the reasonably foreseeable needs of the Indians living on the reservation rather than by the number of irrigable acres; and, finally, that the judicial doctrine of equitable apportionment should be used to divide the water between the Indians and the other people in the State of Arizona.

The last argument is easily answered. The doctrine of equitable apportionment is a method of resolving water disputes between States. It was created by this Court in the exercise of its original jurisdiction over controversies in which States are parties. An Indian Reservation is not a State. And while Congress has sometimes left Indian Reservations considerable power to manage their own affairs, we are not convinced by Arizona's argument that each reservation is so much like a State that its rights to water should be determined

[97]The Reservations were Chemehuevi, Cocopah, Yuma, Colorado River and Fort Mohave.

[98]Act of March 3, 1865, 13 Stat. 541, 559.

[99]See Executive Orders of November 22, 1873, November 16, 1874, and May 15, 1876. See also Executive Order of November 22, 1915. These orders may be found in 1 U.S. Dept. of the Interior, Executive Orders Relating to Indian Reservations 6-7 (1912); 2 *id.*, at 5-6 (1922).

[100]Executive Orders of January 9, 1884 (Yuma), September 19, 1890 (Fort Mohave), February 2, 1911 (Fort Mohave), September 27, 1917 (Cocopah). For these orders, see 1 *id.*, at 12-13, 63-64 (1912); 2 *id.*, at 5 (1922). The Chemehuevi Reservation was established by the Secretary of the Interior on February 2, 1907, pending congressional approval.

by the doctrine of equitable apportionment. Moreover, even were we to treat an Indian Reservation like a State, equitable apportionment would still not control since, under our view, the Indian claims here are governed by the statutes and Executive Orders creating the reservations.

Arizona's contention that the Federal Government had no power, after Arizona became a State, to reserve waters for the use and benefit of federally reserved lands rests largely upon statements in *Pollard's Lessee* v. *Hagan*, 3 How. 212 (1845), and *Shively* v. *Bowlby*, 152 U.S. 1 (1894). Those cases and others that followed them[101] gave rise to the doctrine that lands underlying navigable waters within territory acquired by the Government are held in trust for future States and that title to such lands is automatically vested in the States upon admission to the Union. But those cases involved only the shores of and lands beneath navigable waters. They do not determine the problem before us and cannot be accepted as limiting the broad powers of the United States to regulate navigable waters under the Commerce Clause and to regulate government lands under Art. IV, § 3, of the Constitution. We have no doubt about the power of the United States under these clauses to reserve water rights for its reservations and its property.

Arizona also argues that, in any event, water rights cannot be reserved by Executive Order. Some of the reservations of Indian lands here involved were made almost 100 years ago, and all of them were made over 45 years ago. In our view, these reservations, like those created directly by Congress, were not limited to land, but included waters as well. Congress and the Executive have ever since recognized these as Indian Reservations. Numerous appropriations, including appropriations for irrigation projects, have been made by Congress. They have been uniformly and universally treated as reservations by map makers, surveyors, and the public. We can give but short shrift at this late date to the argument that the reservations either of land or water are invalid because they were originally set apart by the Executive.[102]

Arizona also challenges the Master's holding as to the Indian Reservations on two other grounds: first, that there is a lack of evidence showing that the United States in establishing the reservations intended to reserve water for them; second, that even if water was meant to be reserved the Master has awarded too much water. We reject both of these contentions. Most of the land in these reservations is and always has been arid. If the water necessary to sustain life is to be had, it must come from the Colorado River or its tributaries. It can be said without overstatement that when the Indians were put on these reservations they were not considered to be located in the most desirable area of the Nation. It is impossible to believe that when Congress created the great Colorado River Indian Reservation and when the Executive Department of this Nation created the other reservations they were unaware that most of the lands were of the desert kind—hot scorching sands—and that water from the river would be essential to the life of the Indian people and to the animals they hunted and the crops they raised. In the debate leading to approval of the first congressional appropriation for irrigation of the Colorado River Indian Reservation, the delegate from the Territory of Arizona made this statement:

> "Irrigating canals are essential to the prosperity of these Indians. Without water there can be no production, no life; and all they ask of you is to give them a few agricultural implements to enable them to dig an irrigating canal by which their lands may be watered and their fields irrigated, so that they may enjoy the means of existence. You must provide these Indians with the means of subsistence or they will take by robbery from those who have. During the last year I have seen a number of these Indians starved to death for want of food." Cong. Globe, 38th Cong., 2d Sess. 1321 (1865).

The question of the Government's implied reservation of water rights upon the creation of an Indian Reservation was before this Court in *Winters* v. *United States*, 207 U.S. 564, decided in 1908. Much of the same argument made to us was made in *Winters* to persuade the Court to hold that Congress hasd created an Indian Reservation without intending to reserve waters necessary to make the reservation livable. The Court rejected all of the arguments. As to whether water was intended to be reserved, the Court said, at p. 576:

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[101]See, e.g., *United States* v. *California*, 332 U.S. 19, 29-30 (1947); *United States* v. *Holt State Bank*, 270 U.S. 49, 54-55 (1926).
[102]See *United States* v. *Midwest Oil Co.*, 236 U.S. 459, 469-475 (1915); *Winters* v. *United States*, 207 U.S. 564 (1908).

"The lands were arid and, without irrigation, were practically valueless. And yet, it is contended, the means of irrigation were deliberately given up by the Indians and deliberately accepted by the Government. The lands ceded were, it is true, also arid; and some argument may be urged, and is urged, that with their cession there was the cession of the waters, without which they would be valueless, and 'civilized communities could not be established thereon.' And this, it is further contended, the Indians knew, and yet made no reservation of the waters. We realize that there is a conflict of implications, but that which makes for the retention of the waters is of greater force than that which makes for their cession."

The Court in *Winters* concluded that the Government, when it created that Indian Reservation, intended to deal fairly with the Indians by reserving for them the waters without which their lands would have been useless. *Winters* has been followed by this Court as recently as 1939 in *United States* v. *Powers*, 305 U.S. 527. We follow it now and agree that the United States did reserve the water rights for the Indians effective as of the time the Indian Reservations were created. This means, as the Master held, that these water rights, having vested before the Act became effective on June 25, 1929, are "present perfected rights" and as such are entitled to priority under the Act.

We also agree with the Master's conclusion as to the quantity of water intended to be reserved. He found that the water was intended to satisfy the future as well as the present needs of the Indian Reservations and ruled that enough water was reserved to irrigate all the practicably irrigable acreage on the reservations. Arizona, on the other hand, contends that the quantity of water reserved should be measured by the Indians' "reasonably foreseeable needs," which, in fact, means by the number of Indians. How many Indians there will be and what their future needs will be can only be guessed. We have concluded, as did the Master, that the only feasible and fair way by which reserved water for the reservations can be measured is irrigable acreage. The various acreages of irrigable land which the Master found to be on the different reservations we find to be reasonable.

We disagree with the Master's decision to determine the disputed boundaries of the Colorado River Indian Reservation and the Fort Mohave Indian Reservation. We hold that it is unnecessary to resolve those disputes here. Should a dispute over title arise because of some future refusal by the Secretary to deliver water to either area, the dispute can be settled at that time.

The Master ruled that the principle underlying the reservation of water rights for Indian Reservations was equally applicable to other federal establishments such as National Recreation Areas and National Forests. We agree with the conclusions of the Master that the United States intended to reserve water sufficient for the future requirements of the Lake Mead National Recreation Area, the Havasu Lake National Wildlife Refuge, the Imperial National Wildlife Refuge and the Gila National Forest.

We reject the claim of the United States that it is entitled to the use, without charge against its consumption, of any waters that would have been wasted but for salvage by the Government on its wildlife preserves. Whatever the intrinsic merits of this claim, it is inconsistent with the Act's command that consumptive use shall be measured by diversions less returns to the river.

Finally, we note our agreement with the Master that all uses of mainstream water within a State are to be charged against that State's apportionment, which of course includes uses by the United States.

VI.

DECREE.

While we have in the main agreed with the Master, there are some places we have disagreed and some questions on which we have not ruled. Rather than adopt the Master's decree with amendments or append our own decree to this opinion, we will allow the parties, or any of them, if they wish, to submit before September 16, 1963, the form of decree to carry this opinion into effect, failing which the Court will prepare and enter an appropriate decree at the next Term of Court.

It is so ordered.

THE CHIEF JUSTICE took no part in the consideration or decision of this case.

[For opinion of MR. JUSTICE HARLAN, joined by MR. JUSTICE DOUGLAS and MR. JUSTICE STEWART, see *post*, p. 603.]

[For dissenting opinion of MR. JUSTICE DOUGLAS, see *post*, p. 627.]

902

SUPREME COURT OF THE UNITED STATES

No. 8, ORIGINAL

STATE OF ARIZONA, PLAINTIFF

v.

STATE OF CALIFORNIA, ET AL., DEFENDANTS

DECREE.—MARCH 9, 1964.

It is ORDERED, ADJUDGED AND DECREED that

I. For purposes of this decree:

(A) "Consumptive use" means diversions from the stream less such return flow thereto as is available for consumptive use in the United States or in satisfaction of the Mexican treaty obligation;

(B) "Mainstream" means the mainstream of the Colorado River downstream from Lee Ferry within the United States, including the reservoirs thereon;

(C) Consumptive use from the mainstream within a state shall include all consumptive uses of water of the mainstream, including water drawn from the mainstream by underground pumping, and including but not limited to, consumptive uses made by persons, by agencies of that state, and by the United States for the benefit of Indian reservations and other federal establishments within the state;

(D) "Regulatory structures controlled by the United States" refers to Hoover Dam, Davis Dam, Parker Dam, Headgate Rock Dam, Palo Verde Dam, Imperial Dam, Laguna Dam and all other dams and works on the mainstream now or hereafter controlled or operated by the United States which regulate the flow of water in the mainstream or the diversion of water from the mainstream;

(E) "Water controlled by the United States" refers to the water in Lake Mead, Lake Mohave, Lake Havasu and all other water in the mainstream below Lee Ferry and within the United States;

(F) "Tributaries" means all stream systems the waters of which naturally drain into the mainstream of the Colorado River below Lee Ferry;

(G) "Perfected right" means a water right acquired in accordance with state law, which right has been exercised by the actual diversion of a specific quantity of water that has been applied to a defined area of land or to definite municipal or industrial works, and in addition shall include water rights created by the reservation of mainstream water for the use of federal establishments under federal law whether or not the water has been applied to beneficial use;

(H) "Present perfected rights" means perfected rights, as here defined, existing as of June 25, 1929, the effective date of the Boulder Canyon Project Act;

(I) "Domestic use" shall include the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but shall exclude the generation of electrical power;

(J) "Annual" and "Year," except where the context may otherwise require, refer to calendar years;

(K) Consumptive use of water diverted in one state for consumptive use in another state shall be treated as if diverted in the state for whose benefit it is consumed.

II. The United States, its officers, attorneys, agents and employees be and they are hereby severally enjoined:

(A) From operating regulatory structures controlled by the United States and from releasing water controlled by the United States other than in accordance with the following order of priority:

(1) For river regulation, improvement of navigation, and flood control;

(2) For irrigation and domestic uses, including the satisfaction of present perfected rights; and

(3) For power;

Provided, however, that the United States may release water in satisfaction of its obligations to the United States of Mexico under the treaty dated February 3, 1944, without regard to the priorities specified in this subdivision (A);

(B) From releasing water controlled by the United States for irrigation and domestic use in the States of Arizona, California and Nevada, except as follows:

(1) If sufficient mainstream water is available for release, as determined by the Secretary of the Interior, to satisfy 7,500,000 acre-feet of annual consumptive use in the aforesaid three states, then of such 7,500,000 acre feet of consumptive use, there shall be apportioned 2,800,000 acre-feet for use in Arizona, 4,400,000 acre-feet for use in California, and 300,000 acre-feet for use in Nevada;

(2) If sufficient mainstream water is available for release, as determined by the Secretary of the Interior, to satisfy annual consumptive use in the aforesaid states in excess of 7,500,000 acre feet, such excess consumptive use is surplus, and 50% thereof shall be apportioned for use in Arizona and 50% for use in California; provided, however, that if the United States so contracts with Nevada, then 46% of such surplus shall be apportioned for use in Arizona and 4% for use in Nevada;

(3) If insufficient mainstream water is available for release, as determined by the Secretary of the Interior, to satisfy annual consumptive use of 7,500,000 acre feet in the aforesaid three states, then the Secretary of the Interior, after providing for satisfaction of present perfected rights in the order of their priority dates without regard to state lines and after consultation with the parties to major delivery contracts and such representatives as the respective states may designate, may apportion the amount remaining available for consumptive use in such manner as is consistent with the Boulder Canyon Project Act as interpreted by the opinion of this Court herein, and with other applicable federal statutes, but in no event shall more than 4,400,000 acre feet be apportioned for use in California including all present perfected rights;

(4) Any mainstream water consumptively used within a state shall be charged to its apportionment, regardless of the purpose for which it was released;

(5) Notwithstanding the provisions of Paragraphs (1) through (4) of this subdivision (B), mainstream water shall be released or delivered to water users (including but not limited to, public and municipal corporations and other public agencies) in Arizona, California, and Nevada only pursuant to valid contracts therefor made with such users by the Secretary of the Interior, pursuant to Section 5 of the Boulder Canyon Project Act or any other applicable federal statute;

(6) If, in any one year, water apportioned for consumptive use in a state will not be consumed in that state, whether for the reason that delivery contracts for the full amount of the state's apportionment are not in effect or that users cannot apply all of such water to beneficial uses, or for any other reason, nothing in this decree shall be construed as prohibiting the Secretary of the Interior from releasing such apportioned but unused water during such year for consumptive use in the other states. No rights to the recurrent use of such water shall accrue by reason of the use thereof;

(C) From applying the provisions of Article 7 (d) of the Arizona water delivery contract dated February 9, 1944, and the provisions of Article 5 (a) of the Nevada water delivery contract dated March 30, 1942, as amended by the contract dated January 3, 1944, to reduce the apportionment or delivery of mainstream water to users within the States of Arizona and Nevada by reason of any uses in such states from the tributaries flowing therein;

(D) From releasing water controlled by the United States for use in the States of Arizona, California, and Nevada for the benefit of any federal establishment named in this subdivision (D) except in accordance with

the allocations made herein; provided, however, that such release may be made notwithstanding the provisions of Paragraph (5) of subdivision (B) of this Article; and provided further that nothing herein shall prohibit the United States from making future additional reservations of mainstream water for use in any of such States as may be authorized by law and subject to present perfected rights and rights under contracts theretofore made with water users in such State under Section 5 of the Boulder Canyon Project Act or any other applicable federal statute:

(1) The Chemehuevi Indian Reservation in annual quantities not to exceed (i) 11,340 acre feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 1,900 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of February 2, 1907;

(2) The Cocopah Indian Reservation in annual quantities not to exceed (i) 2,744 acre feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 431 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of September 27, 1917;

(3) The Yuma Indian Reservation in annual quantities not to exceed (i) 51,616 acre feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 7,743 acres and for the satisfaction of related uses, whichever of (i) or (ii), is less, with a priority date of January 9, 1884;

(4) The Colorado River Indian Reservation in annual quantities not to exceed (i) 717,148 acre feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 107,588 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with priority dates of March 3, 1865, for lands reserved by the Act of March 3, 1865 (13 Stat. 541, 559); November 22, 1873, for lands reserved by the Executive Order of said date; November 16, 1874, for lands reserved by the Executive Order of said date, except as later modified; May 15, 1876, for lands reserved by the Executive Order of said date; November 22, 1915, for lands reserved by the Executive Order of said date;

(5) The Fort Mohave Indian Reservation in annual quantities not to exceed (i) 122,648 acre feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 18,974 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, and, subject to the next succeeding proviso, with priority dates of September 18, 1890, for lands transferred by the Executive Order of said date; February 2, 1911, for lands reserved by the Executive Order of said date; provided, however, that lands conveyed to the State of California pursuant to the Swamp and Overflowed Lands Act [9 Stat. 519 (1850)] as well as any accretions thereto to which the owners of such land may be entitled, and lands patented to the Southern Pacific Railroad pursuant to the Act of July 27, 1866 (14 Stat. 292) shall not be included as irrigable acreage within the Reservation and that the above specified diversion requirement shall be reduced by 6.4 acre feet per acre of such land that is irrigable; provided that the quantities fixed in this paragraph and paragraph (4) shall be subject to appropriate adjustment by agreement or decree of this Court in the event that the boundaries of the respective reservations are finally determined;

(6) The Lake Mead National Recreation Area in annual quantities reasonably necessary to fulfill the purposes of the Recreation Area, with priority dates of March 3, 1929, for lands reserved by the Executive Order of said date (No. 5105), and April 25, 1930, for lands reserved by the Executive Order of said date (No. 5339);

(7) The Havasu Lake National Wildlife Refuge in annual quantities reasonably necessary to fulfill the purposes of the Refuge, not to exceed (i) 41,839 acre feet of water diverted from the mainstream or (ii) 37,339 acre feet of consumptive use of mainstream water, whichever of (i) or (ii) is less, with a priority date of January 22, 1941, for lands reserved by the Executive Order of said date (No. 8647), and a priority date of February 11, 1949, for land reserved by the Public Land Order of said date (No. 559);

(8) The Imperial National Wildlife Refuge in annual quantities reasonably necessary to fulfill the purposes of the Refuge not to exceed (i) 28,000 acre feet of water diverted from the mainstream or (ii) 23,000 acre feet of consumptive use of mainstream water, whichever of (i) or (ii) is less, with a priority date of February 14, 1941;

(9) Boulder City, Nevada, as authorized by the Act of September 2, 1958, 72 Stat. 1726, with a priority date of May 15, 1931;

Provided further, that consumptive uses from the mainstream for the benefit of the above-named federal establishments shall, except as necessary to satisfy present perfected rights in the order of their priority dates without regard to state lines, be satisfied only out of water available, as provided in subdivision (B) of this Article, to each state wherein such uses occur and subject to, in the case of each reservation, such rights as have been created prior to the establishment of such reservation by contracts executed under Section 5 of the Boulder Canyon Project Act or any other applicable federal statute.

III. The States of Arizona, California and Nevada, Palo Verde Irrigation District, Imperial Irrigation District, Coachella Valley County Water District, Metropolitan Water District of Southern California, City of Los Angeles, City of San Diego, and County of San Diego, and all other users of water from the mainstream in said states, their officers, attorneys, agents and employees, be and they are hereby severally enjoined:

(A) From interfering with the management and operation, in conformity with Article II of this decree, of regulatory structures controlled by the United States;

(B) From interfering with or purporting to authorize the interference with releases and deliveries, in conformity with Article II of this decree, of water controlled by the United States;

(C) From diverting or purporting to authorize the diversion of water from the mainstream the diversion of which has not been authorized by the United States for use in the respective states; and provided further that no party named in this Article and no other user of water in said states shall divert or purport to authorize the diversion of water from the mainstream the diversion of which has not been authorized by the United States for its particular use;

(D) From consuming or purporting to authorize the consumptive use of water from the mainstream in excess of the quantities permitted under Article II of this decree.

IV. The State of New Mexico, its officers, attorneys, agents and employees, be and they are after four years from the date of this decree hereby severally enjoined:

(A) From diverting or permitting the diversion of water from San Simon Creek, its tributaries and underground water sources for the irrigation of more than a total of 2,900 acres during any one year, and from exceeding a total consumptive use of such water, for whatever purpose, of 72,000 acre feet during any period of ten consecutive years; and from exceeding a total consumptive use of such water, for whatever purpose, of 8,220 acre feet during any one year;

(B) From diverting or permitting the diversion of water from the San Francisco River, its tributaries and underground water sources for the irrigation within each of the following areas of more than the following number of acres during any one year:

Luna Area	225
Apache Creek-Aragon Area	316
Reserve Area	725
Glenwood Area	1,003

and from exceeding a total consumptive use of such water for whatever purpose, of 31,870 acre-feet during any period of ten consecutive years; and from exceeding a total consumptive use of such water, for whatever purpose, of 4,112 acre-feet during any one year;

(C) From diverting or permitting the diversion of water from the Gila River, its tributaries (exclusive of the San Francisco River and San Simon Creek and their tributaries) and underground water sources for the irrigation within each of the following areas of more than the following number of acres during any one year:

Upper Gila Area	287
Cliff-Gila and Buckhorn-Duck Creek Area	5,314
Red Rock Area	1,456

and from exceeding a total consumptive use of such water (exclusive of uses in Virden Valley, New Mexico), for whatever purpose, of 136,620 acre feet during any period of ten consecutive years; and from exceeding a

total consumptive use of such water (exclusive of uses in Virden Valley, New Mexico), for whatever purpose, of 15,895 acre feet during any one year;

(D) From diverting or permitting the diversion of water from the Gila River and its underground water sources in the Virden Valley, New Mexico, except for use on lands determined to have the right to the use of such water by the decree entered by the United States District Court for the District of Arizona on June 29, 1935, in *United States* v. *Gila Valley Irrigation District, et al.* (Globe Equity No. 59) (herein referred to as the Gila Decree), and except pursuant to and in accordance with the terms and provisions of the Gila Decree; provided, however, that:

(1) This decree shall not enjoin the use of underground water on any of the following lands:

Owner	Subdivision and Legal Description	Sec.	Twp.	Rng.	Acreage
Marvin Arnett and J. C. O'Dell.	Part Lot 3	6	19S	21W	33.84
	Part Lot 4	6	19S	21W	52.33
	NW¼SW¼	5	19S	21W	38.36
	SW¼SW¼	5	19S	21W	39.80
	Part Lot 1	7	19S	21W	50.68
	NW¼NW¼	8	19S	21W	38.03
Hyrum M. Pace, Ray Richardson, Harry Day and N. O. Pace, Est.	SW¼NE¼	12	19S	21W	8.00
	SW¼NE¼	12	19S	21W	15.00
	SE¼NE¼	12	19S	21W	7.00
C. C. Martin	S. part SE¼SW¼SE¼	1	19S	21W	0.93
	W½W½W½NE¼NE¼	12	19S	21W	0.51
	NW¼NE¼	12	19S	21W	18.01
A. E. Jacobson	SW part Lot 1	6	19S	21W	11.58
W. LeRoss Jones	E. Central part: E½E½E½NW¼NW¼	12	19S	21W	0.70
	SW part NE¼NW¼	12	19S	21W	8.93
	N. Central part: N½N½NW¼SE¼NW¼	12	19S	21W	0.51
Conrad and James R. Donaldson	N½N½N½SE¼	18	19S	20W	8.00
James D. Freestone	Part W½NW¼	33	18S	21W	7.79
Virgil W. Jones	N½SE¼NW¼; SE¼NE¼NW¼	12	19S	21W	7.40
Darrell Brooks	SE¼SW¼	32	18S	21W	6.15
Floyd Jones	Part N½SE¼NE¼	13	19S	21W	4.00
	Part NW¼SW¼NW¼	18	19S	20W	1.70

Owner	Subdivision and Legal Description	Sec.	Twp.	Rng.	Acreage
L. M. Hatch	SW¼SW¼	32	18S	21W	4.40
	Virden Townsite	...	...	...	3.90
Carl M. Donaldson	SW¼SE¼	12	19S	21W	3.40
Mack Johnson	Part NW¼NW¼NE¼	10	19S	21W	2.80
	Part NE¼NW¼NE¼	10	19S	21W	0.30
	Part N½N½S½NW¼NE¼	10	19S	21W	0.10
Chris Dotz	SE¼SE¼; SW¼SE¼	3	19S	21W	2.66
	NW¼NE¼; NE¼NE¼	10	19S	21W	
Roy A. Johnson	NE¼SE¼SE¼	4	19S	21W	1.00
Ivan and Antone Thygerson	NE¼SE¼SE¼	32	18S	21W	1.00
John W. Bonine	SW¼SE¼SW¼	34	18S	21W	1.00
Marion K. Mortenson	SW¼SW¼SE¼	33	18S	21W	1.00
Total			...	...	380.81

or on lands or for other uses in the Virden Valley to which such use may be transferred or substituted on retirement from irrigation of any of said specifically described lands, up to a maximum total consumptive use of such water of 838.2 acre-feet per annum, unless and until such uses are adjudged by a court of competent jurisdiction to be an infringement or impairment of rights confirmed by the Gila Decree; and

(2) This decree shall not prohibit domestic use of water from the Gila River and its underground water sources on lands with rights confirmed by the Gila Decree, or on farmsteads located adjacent to said lands, or in the Virden Townsite, up to a total consumptive use of 265 acre feet per annum in addition to the uses confirmed by the Gila Decree, unless and until such use is adjudged by a court of competent jurisdiction to be an infringement or impairment of rights confirmed by the Gila Decree;

(E) Provided, however, that nothing in this Article IV shall be construed to affect rights as between individual water users in the State of New Mexico, nor shall anything in this Article be construed to affect possible superior rights of the United States asserted on behalf of National Forests, Parks, Memorials, Monuments and lands administered by the Bureau of Land Management; and provided further that in addition to the diversions authorized herein the United States has the right to divert water from the mainstream of the Gila and San Francisco Rivers in quantities reasonably necessary to fulfill the purposes of the Gila National Forest with priority dates as of the date of withdrawal for forest purposes of each area of the forest within which the water is used.

(F) Provided, further, that no diversion from a stream authorized in Articles IV (A) through (D) may be transferred to any of the other streams, nor may any use for irrigation purposes within any area on one of the streams be transferred for use for irrigation purposes to any other area on that stream.

V. The United States shall prepare and maintain, or provide for the preparation and maintenance of, and shall make available, annually and at such shorter intervals as the Secretary of the Interior shall deem

necessary or advisable, for inspection by interested persons at all reasonable times and at a reasonable place or places, complete, detailed and accurate records of:

(A) Releases of water through regulatory structures controlled by the United States;

(B) Diversions of water from the mainstream, return flow of such water to the stream as is available for consumptive use in the United States or in satisfaction of the Mexican treaty obligation, and consumptive use of such water. These quantities shall be stated separately as to each diverter from the mainstream, each point of diversion, and each of the States of Arizona, California and Nevada;

(C) Releases of mainstream water pursuant to orders therefor but not diverted by the party ordering the same, and the quantity of such water delivered to Mexico in satisfaction of the Mexican Treaty or diverted by others in satisfaction of rights decreed herein. These quantities shall be stated separately as to each diverter from the mainstream, each point of diversion, and each of the States of Arizona, California and Nevada;

(D) Deliveries to Mexico of water in satisfaction of the obligations of Part III of the Treaty of February 3, 1944, and, separately stated, water passing to Mexico in excess of treaty requirements;

(E) Diversions of water from the mainstream of the Gila and San Francisco Rivers and the consumptive use of such water, for the benefit of the Gila National Forest.

VI. Within two years from the date of this decree, the States of Arizona, California, and Nevada shall furnish to this Court and to the Secretary of the Interior a list of the present perfected rights, with their claimed priority dates, in waters of the mainstream within each state, respectively, in terms of consumptive use, except those relating to federal establishments. Any named party to this proceeding may present its claim of present perfected rights or its opposition to the claims of others. The Secretary of the Interior shall supply similar information, within a similar period of time, with respect to the claims of the United States to present perfected rights within each state. If the parties and the Secretary of the Interior are unable at that time to agree on the present perfected rights to the use of mainstream water in each state, and their priority dates, any party may apply to the Court for the determination of such rights by the Court.

VII. The State of New Mexico shall, within four years from the date of this decree, prepare and maintain, or provide for the preparation and maintenance of, and shall annually thereafter make available for inspection at all reasonable times and at a reasonable place or places, complete, detailed and accurate records of:

(A) The acreages of all lands in New Mexico irrigated each year from the Gila River, the San Francisco River, San Simon Creek and their tributaries and all of their underground water sources, stated by legal description and component acreages and separately as to each of the areas designated in Article IV of this decree and as to each of the three streams;

(B) Annual diversions and consumptive uses of water in New Mexico, from the Gila River, the San Francisco River and San Simon Creek and their tributaries, and all their underground water sources, stated separately as to each of the three streams.

VIII. This decree shall not affect:

(A) The relative rights *inter sese* of water users within any one of the states, except as otherwise specifically provided herein;

(B) The rights or priorities to water in any of the Lower Basin tributaries of the Colorado River in the States of Arizona, California, Nevada, New Mexico and Utah except the Gila River System;

(C) The rights or priorities, except as specific provision is made herein, of any Indian Reservation, National Forest, Park, Recreation Area, Monument or Memorial, or other lands of the United States;

(D) Any issue of interpretation of the Colorado River Compact.

IX. Any of the parties may apply at the foot of this decree for its amendment or for further relief. The Court retains jurisdiction of this suit for the purpose of any order, direction, or modification of the decree, or any supplementary decree, that may at any time be deemed proper in relation to the subject matter in controversy.

MR. JUSTICE DOUGLAS dissents.

MR. JUSTICE HARLAN and MR. JUSTICE STEWART dissent to the extent that the decree conflicts with the views expressed in the dissenting opinion of MR. JUSTICE HARLAN, 373 U.S. 546, 603.

THE CHIEF JUSTICE took no part in the consideration or decision of this case.

APPENDIX X - PRESENT PERFECTED RIGHTS

1001 - United States "List of Present Perfected Right Claims" filed March 9, 1967, with Supreme Court

1002 - California's "List of Present Perfected Right Claims" filed March 9, 1967, with Supreme Court

1003 - Arizona's "List of Present Perfected Right Claims"

1004 - United States Proposed Stipulation submitted by Interior to Justice, April 12, 1973

1005 - Supreme Court Opinion and Supplemental Decree of January 9, 1979

1001

In the Supreme Court of the United States

OCTOBER TERM, 1966

No. 8, ORIGINAL

STATE OF ARIZONA, COMPLAINANT

v.

STATE OF CALIFORNIA, PALO VERDE IRRIGATION DISTRICT, IMPERIAL IRRIGATION DISTRICT, COACHELLA VALLEY COUNTY WATER DISTRICT, METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, CITY OF LOS ANGELES, CALIFORNIA, CITY OF SAN DIEGO, CALIFORNIA, AND COUNTY OF SAN DIEGO, CALIFORNIA, DEFENDANTS

THE UNITED STATES OF AMERICA AND STATE OF NEVADA, INTERVENERS

STATE OF UTAH AND STATE OF NEW MEXICO, IMPLEADED DEFENDANTS

LIST OF PRESENT PERFECTED RIGHTS CLAIMED BY THE UNITED STATES

Pursuant to Article VI of the Decree entered herein, 376 U.S. 340, as amended, 383 U.S. 268, we submit the list supplied by the Secretary of the Interior of the present perfected rights claimed by the United States within each state in the mainstream of the Colorado River. This list is in two parts:

(I) The further definition of the present perfected rights claimed for the federal establishments named in Article II, subdivision (D), paragraphs (1) through (6), such rights having been decreed in said Article II.

(II) Other present perfected rights claimed by the United States. These claims are made with respect to those irrigation projects which were authorized and undertaken by the United States under the federal reclamation laws prior to the effective date of the Boulder Canyon Project Act. Each of these claims is stated in the first instance in terms of diversions at Imperial Dam. While the diversion point for each of these projects pre-1929 was different from Imperial Dam, the diversion point is now that dam and appropriate adjustments of the quantities of water actually diverted and applied to beneficial use on the several projects before June 25, 1929, have been made to reflect the new diversion point.

I

Present perfected rights for Indian reservations in waters of the mainstream of the Colorado River

Indian Reservation	State	Present Perfected Rights[1] Diversion Acre-Feet	Net Acres	Priority Date
Yuma	California	51,616	7,743	January 9, 1884.
Fort Mojave	Arizona	27,969	4,327	September 18, 1890.
	do	68,447	10,589	February 2, 1911.
	California	13,698	2,119	September 18, 1890.
	Nevada	12,534	1,939	September 18, 1890.
Chemehuevi	California	11,340	1,900	February 2, 1907.
Cocopah	Arizona	2,744	431	September 27, 1917.
Colorado River	do	358,400	53,768	March 3, 1865.
	do	252,016	37,808	November 22, 1873.
	do	51,986	7,799	November 16, 1874.
	California	10,745	1,612	November 22, 1873.
	do	40,241	6,037	November 16, 1874.
	do	3,760	564	May 15, 1876.
		905,496	136,636	

[1]According to the terms of the Decree, the quantity of water in each instance is measured by (i) diversions or (ii) consumptive use required for irrigation of the respective acreage, and for satisfaction of related uses, whichever of (i) or (ii) is less.

Present perfected rights for national recreation area in the waters of the mainstream of the Colorado River

	State	Present Perfected Rights Diversion Acre-Feet	Priority Date
Lake Mead National Recreation Area (The Overton Area of Lake Mead N.R.A., provided in Executive Order 5105.)	Nevada	500	May 3, 1929[1]

[1]The Decree, Article II(D)(6) specifies a priority date of March 3, 1929. Executive Order 5105 is dated May 3, 1929 (see 3 C.F.R., 1964 Cumulative Pocket Supplement, page 276), and the Findings of Fact and Conclusions of Law of the Special Master use the date of May 3, 1929 (Special Master's Report, pp. 294-295). The date herein is therefore made May 3, 1929. The use of water under this claim is for domestic purposes. The estimated consumptive use is 300 acre-feet per annum.

II

Present perfected rights to water from the mainstream of the Colorado River for Federal reclamation projects

(1) The Reservation Division, Yuma Reclamation Project, California, exclusive of lands in the Yuma Indian Reservation, in annual quantities not to exceed

(i) 39,561 acre-feet of diversions from the mainstream measured at Imperial Dam or

(ii) the quantity of mainstream water necessary to supply the consumptive use required for the irrigation of 6,215 acres within the boundaries of the Reservation Division as of June 25, 1929, and the satisfaction of related uses,

whichever of (i) or (ii) is less, with a priority date of July 8, 1905.

(2) The Yuma Auxiliary Project, Arizona, in annual quantities not to exceed

(i) 6,801 acre-feet of diversions from the mainstream measured at Imperial Dam or

(ii) the quantity of mainstream water necessary to supply the consumptive use required for the irrigation of 1,165 acres within the boundaries of the Yuma Auxiliary Project and 60 acres adjacent thereto, as of June 25, 1929, and for the satisfaction of related uses,

whichever of (i) or (ii) is less, with a priority date of July 8, 1905.

(3) The North Gila Valley Unit, Yuma Mesa Division, Gila Reclamation Project, Arizona, in annual quantities not to exceed

(i) 31,994 acre-feet of diversions from the mainstream measured at Imperial Dam, or

(ii) the quantity of mainstream water necessary to supply the consumptive use required for the irrigation of 5,000 acres within the boundaries of the North Gila Valley Irrigation District as of June 25, 1929, and the satisfaction of related uses,

whichever of (i) or (ii) is less, with a priority date of July 8, 1905.

(4) The Valley Division, Yuma Reclamation Project, Arizona, in annual quantities not to exceed

(i) 299,852 acre-feet of diversions from the mainstream measured at Imperial Dam or

(ii) the quantity of mainstream water necessary to supply the consumptive use required for the irrigation of 46,563 acres within the boundaries of the Valley Division as of June 25, 1929, and the satisfaction of related uses,

whichever of (i) or (ii) is less, with a priority date of October 23, 1890, so far as this date may be allowable under applicable law. Alternatively, priority dates of June 8, 1897, January 18, 1902, and July 8, 1905, are claimed.

Respectfully submitted.

THURGOOD MARSHALL,
Solicitor General.

MARCH 1967.

IN THE 1002

Supreme Court of the United States

October Term 1966

No. 8 Original

STATE OF ARIZONA, *Complainant,*

vs.

STATE OF CALIFORNIA, PALO VERDE IRRIGATION DISTRICT, IMPERIAL IRRIGATION DISTRICT, COACHELLA VALLEY COUNTY WATER DISTRICT, THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, CITY OF LOS ANGELES, CITY OF SAN DIEGO, AND COUNTY OF SAN DIEGO, *Defendants,*

UNITED STATES OF AMERICA and STATE OF NEVADA, *Interveners,*

STATE OF NEW MEXICO and STATE OF UTAH, *Impleaded Defendants.*

List of Present Perfected Rights in the State of California (Excluding Federal Establishments) Pursuant to Article VI of Decree.

Submitted by

Defendant State of California

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IN THE

Supreme Court of the United States

October Term 1966

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STATE OF ARIZONA, *Complainant,*

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List of Present Perfected Rights in the State of California (Excluding Federal Establishments) Pursuant to Article VI of Decree.

Submitted by

Defendant State of California

1. Defendant State of California does hereby "furnish to this Court and to the Secretary of the Interior" and to the States of Arizona and Nevada the following "list of the present perfected rights, with their claimed priority dates, in waters of the main stream" within the State of California, "in terms of consumptive use, except those relating to federal establishments" [Article VI of the decree entered herein on March 9, 1964 (376 U.S. 340, 351-52), as amended on February 28, 1966 (383 U.S. 286)]:

(1) Defined Area of Land or Definite Municipal or Industrial Works	(2) Consumptive Use (acre-feet per annum)	(3) Priority Date	(4) Claimant(s)
Within boundaries of Imperial Irrigation District	2,806,000	1895	Imperial Irrigation District
Within boundaries of Palo Verde Irrigation District	208,100	1877	Palo Verde Irrigation District
Yuma Project, Reservation Division, non-Indian portion (Bard Irrigation District): Entries and areas irrigated prior to June 25, 1929[1]	21,162[1a]	1905	Owners of individual entries and areas[1]
City of Needles, California	2,000	Early 1880's	City of Needles, California
Lots 1, 2, and 3, SE ¼ of SE ¼ and/or SE ¼ of NE ¼, Sec. 27, T.16S., R.22E., S.B.B.&M.	765.2	1856	Wavers, Edward M. Hutcheson, John E.
SW ¼, W ½ of SE ¼ in Sec. 1; NW ¼ of NW¼ of Sec. 12; all in T.9N., R.22E., S.B.B.&M.	550	1917	Stephenson, R. B. Olson, Henry

Portions of: Sections 5, 6, 7, and 8, T.7N., R.24E.; Sec. 1, T.7N., R.23E.; Sections 4, 5, 9, 10, 15, 22, 23, 25, 26, 35, and 36, T.8N., R.23E.; Sections 19, 29, 30, 32, and 33, T.9N., R.23E.; all S.B.B.&M.	273	Prior to 1896	Atchison, Topeka, and Santa Fe Railway Company
S ½ of SW ¼, NW ¼ of SW ¼ and SE ¼ of NW ¼; S ½ of SE ¼, NW ¼ of SE ¼ and SW ¼ of NE ¼, all in (Description continued on p. 4)	88	1917	Bleiman, H. Doehring, P.C. Fortner, E. Harmon, B.E. Ruzicka, E.V. (Claimants continued on p. 4)

[1]Identification of these entries and areas and of their current owners (ownerships change from time to time) appear in the official records of the Yuma Project office, Yuma, Arizona. Because this information is a part of those official public records of the Government, the State of California does not consider it necessary to burden this list nor any supplemental decree that follows with identification of the several hundred entries, areas, and persons involved.

[1a]This consumptive use figure results in a diversion requirement of not less than 42,325 acre feet per annum.

(1) Defined Area of Land or Definite Municipal or Industrial Works	(2) Consumptive Use (acre-feet per annum)	(3) Priority Date	(4) Claimant(s)
Sec. 10, T.1S., R.24E., S.B.B.&M.			Ruzicka, S.O. Ruzicka, V.S. Suffdy, C. Walsh, D. Zoff, H.G.
Lots 1 and 2, Sec. 19, T.13S., R.23E., S.B.B.&M., and Lots 2, 3, and 4 of Sec. 24, T.13S., R.22E., S.B.B.&M.	66	1893	Mendivil, B.E. Pat Mines Inc. Young, R.J. & O.
NW ¼ of SE ¼, S ½ of SE ¼, Sec. 24, and NW ¼ of NE ¼, Sec. 25, all in T.9S., R.21E., S.B.B.&M.	66	1928	Grannis, Gladys W.
Lot 6, Sec. 5; Lots 1 and 2, SW ¼ of NE ¼, NE ¼ of SE ¼, (Description continued below)	55	1913	Morgan, J.P.

Sec. 8; Lots 1 and 2, Sec. 9; all in T.13S., R.22E., S.B.B.&M.			
W ½ of NE ¼, E ½ of NW ¼, Sec. 14, T.10S., R.21E., S.B.B.&M.	40	1918	Milpitas Cattle Co., Inc.
N ½ of NE ¼, SE ¼ of NE ¼ and NE ¼ of SE ¼, Sec. 30, T.9N., R.23E., S.B.B.&M.	40	1889	Simons, Helen E. Simons, Irene O. Simons, James A. Simons, Leslie H. Simons, Stefan H. Sullivan, Lena Williams, Rita M.
SW ¼ of NW ¼ of Sec. 5, SE ¼ of NE ¼, Sec. 6, and Lot 9, Sec. 6, all in T.9S., R.22E., S.B.B.&M.	39.6	1912	Fewell, Archie V. and Grace
E ½ of NW ¼, and N ½ of SW ¼, Sec. 12, T.9N., R.22E., S.B.B.&M.	35.2	1921	Colorado River Sportmen's League, Inc.

(1) Defined Area of Land or Definite Municipal or Industrial Works	(2) Consumptive Use (acre-feet per annum)	(3) Priority Date	(4) Claimant(s)
E ½ of NW ¼, Sec. 1, T.10S., R.21E., S.B.B.&M.	25.3	1914	Milpitas Cattle Co., Inc
S ½ of SW ¼, Sec. 12, T.9N., R.22E., S.B.B.&M.	24.2	1921	Andrade, A.D. & D.L. Baldwin, K.L. & J.A. Brown, J.D. & Barbara Collett, Charles & Faye Craig, R.L. Daniel, D.B. & F.D. Gibson, F.E. & M.E. Hazelwood, B.A. & F. Jones, J.P. & E.R. Lindeman, W.H. McShan, F.B. & M.L. Schroeder, W.G. & C.D. Seale, R.A. & H.L. Sherman, C.C. & M.T. Siegers, A.F. & M.N. Tyler, B.L. Van Alstine, H. & R. (Claimants continued below)

			Walton, A. West, G.J. Wetmore, K.C. & J.C. Wetmore, M. Xander, E.J.
Lots 2, 3, and 7 and NE ¼ of SW ¼, Sec. 19, T.9N., R.23E., S.B.B.&M.	23.1	1904	Reynolds, Earl W. Simons, Irene O. Skinner, Otto
NE ¼ of NE ¼, W ½ of NE ¼, and NE ¼ of NW ¼, Sec. 18, T.15S., R.24E., S.B.B.&M.	23.1	1928	Bosworth, Ralph Burr, Barbara Burr, Robert Clark, C.W. Clark, Ronnie W. Lakeview Development Co.
N ½ of NE ¼, SE ¼ of NE ¼ and NE ¼ of SE ¼, Sec. 24, T.9N., R.22E., S.B.B.&M.	22	1905	Cooper, B.B. Dickson, B.J. Gilmore, A.E. & F.E. Lind, W.P. Lind, P.H. Long, Geo. Matwick, Joe McShan, B. (Claimants continued on p. 8)

(1) Defined Area of Land or Definite Municipal or Industrial Works	(2) Consumptive Use (acre-feet per annum)	(3) Priority Date	(4) Claimant(s)
			Monroe, Dr. Jack Norris, O.H. Richardson, R.E. Stuckey's Walton, Jerry
Portions of unsurveyed Sections 1 and 12, T.2S., R.23E., S.B.B.&M.	10	Prior to 1912	Desert View Mines, Inc.
Portions of unsurveyed Sections 6 and 7, T.2S., R.24E., S.B.B.&M.			
Portion of Sec. 31, T.1S., R.24E., S.B.B.&M.			
Undivided 1/8 interest in SW 1/4 of NW 1/4 of NW 1/4, Sec. 23, T.16S., R.22E., S.B.B.&M.	———[2]	1884[8]	Rosamond De Corse

Undivided ¼ interest in SE ¼ of NW ¼ of NW ¼, Sec. 23, T.16S., R.22E., S.B.B.&M.	———[2]	1884[3]	Rosamond De Corse
NW ¼ of SW ¼ of NE ¼, Sec. 20; SW ¼ of NW ¼ of SW ¼ and SE¼, of SE ¼ of NW ¼, both in Sec. 23; all in T.16S., R.22E., S.B.B.&M.	———[2]	1884[3]	Rosamond De Corse
Beginning at an established survey marker at the southeast corner of section 24 in township 16 south of range 22 east of San Bernardino (Description continued on p. 10)	———[4]	1884[5]	Church of Jesus Christ of Latter Day Saints

[2]Aliquot share of the present perfected right of the Yuma Indian Reservation, said right will be presented in the list submitted by the United States pursuant to Article VI of the decree.

[3]See Article II(D)(3) of decree.

[4]Note 2, *supra*.

[5]Note 3, *supra*.

(1) Defined Area of Land or Definite Municipal or Industrial Works	(2) Consumptive Use (acre-feet per annum)	(3) Priority Date	(4) Claimant(s)
Base and Meridian, California, thence north 0° 26′ west a distance of 2647.67 feet to the east ¼ corner of said section 24, thence south 89°43′30″ west a distance of 2419.2 feet to the southeast corner of subject property and point of beginning; thence from said initial point, by metes and bounds, North 0°44′15″ east 208.7 feet, South 89°43′30″ west 208.7 feet, South 0°44′15″ west 208.7 feet, North 89°43′30″ east 208.7 feet to the point of beginning, containing one acre, more or less, together with all the improvements thereon and the appurtenances thereunto belonging.			

2. The United States, in reporting consumptive use of main stream water as required by Article V(B) of the decree, has failed to give diverters of main stream water in the State of California what we contend to be proper credit for all return flows. Therefore, this list of present perfected rights in California is submitted without prejudice to adjustment upward of California's figures should the Government's position be partially or wholly sustained.

3. It has not been possible to determine whether certain persons pumping ground water within the natural Colorado River drainage basin were, prior to June 25, 1929, or are now in fact using main stream water accountable under the decree or using tributary water not covered by the decree. Whenever this uncertainty is resolved, either by stipulation of the parties to this suit or by the Court, the State of California may add to or delete from the foregoing list during the pendency of the present proceedings under Article VI. This list is submitted without prejudice thereto.

Dated: March 9, 1967.

Respectfully submitted,

THOMAS C. LYNCH,
Attorney General,
NORTHCUTT ELY,
Special Assistant
Attorney General,
BURTON J. GINDLER,
DAVID B. STANTON,
Deputy Attorneys General,
C. EMERSON DUNCAN II, ESQ.,
Attorneys for Defendant State of California.

Service of the within and receipt of a copy thereof is hereby admitted this.....day of March, A.D. 1967.

1003

IN THE

Supreme Court of the United States

October Term, 1966

STATE OF ARIZONA,

Complainant,

vs.

STATE OF CALIFORNIA, PALO VERDE IRRIGATION DISTRICT, IMPERIAL IRRIGATION DISTRICT, COACHELLA VALLEY COUNTY WATER DISTRICT, THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, CITY OF LOS ANGELES, CITY OF SAN DIEGO, AND COUNTY OF SAN DIEGO,

Defendants,

UNITED STATES OF AMERICA and STATE OF NEVADA

Interveners,

STATE OF NEW MEXICO and STATE OF UTAH,

Impleaded Defendants.

COMES NOW the Complainant, State of Arizona, and pursuant to Sec. VI of the Decree in *Arizona v. California,* et al, and the Order of the Court extending the time for the submission of claims of Present Perfected Rights to March 9, 1967, and submits the

THESE PAGES NOT REPRODUCED:

PAGES 3 THROUGH 68 PERTAINING TO YUMA PROJECT, VALLEY DIVISION;

PAGES 69 AND 70 PERTAINING TO YUMA AUXILIARY PROJECT;

PAGES 71 AND 72 PERTAINING TO NORTH GILA VALLEY IRRIGATION DISTRICT;

PAGES 99 THROUGH 108, IDENTIFIED AS APPENDIX A AND EXHIBIT B, RESPECTIVELY, PERTAINING TO LEGAL DESCRIPTION OF BOUNDARIES OF YUMA AUXILIARY PROJECT, AND LEGAL DESCRIPTION OF DEFINED AREA OF LAND IN NORTH GILA VALLEY IRRIGATION DISTRICT.

following as its list of present perfected rights, together with claimed priority dates, in waters of the mainstream in terms of consumptive use.

Yuma Project — Valley Division	279,378 A.F.
Yuma Project — Unit B	7,350 A.F.
North Gila Valley Irrigation District	31,840 A.F.
Cibola Valley	27,706 A.F.
Miscellaneous Claimants	45,084.52 A.F.
Supplemental Claim	8,000 A.F.
TOTAL	399,358.52 A.F.

Schedules of the several claims follow.

Respectfully submitted,

O. M. TRASK
Chief Counsel

RALPH HUNSAKER
Associate Counsel
State of Arizona
Arizona Interstate
Stream Commission
112 North Central Avenue
Phoenix, Arizona

—73—

CIBOLA VALLEY

"Present Perfected Rights" for the annual consumptive use of 27,706 acre feet of water on the lands in the Cibola Valley, consisting of 4,763.66 acres of land are claimed.

The priority dates are listed for each defined area of land.

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
1. 320 acres described as follows: SW¼ SW¼ Sec. 7, T1S, R23W NW¼ NW¼ Sec. 18, T1S, R23W S½ SE¼ Sec. 12, T1S, R24W SE¼ SW¼ Sec. 12, T1S, R24W N½ NE¼ Sec. 13, T1S, R24W NE¼ NW¼ Sec. 13, T1S, R24W (Claimant: Ethel B. Alexander)	1920	11/11/1899
2. 155 acres described as follows: NW¼ SW¼ Sec. 6, T1S, R23W S½ NW¼ SW¼ NW¼ Sec. 6, T1S, R23W SW¼ SW¼ NW¼ Sec. 6, T1S, R23W E½ SW¼ NW¼ Sec. 6, T1S, R23W SE¼ NE¼ Sec. 6, T1S, R23W SE¼ NE¼ Sec. 1, T1S, R24W NE¼ SE¼ Sec. 1, T1S, R24W (Claimant: W. R. and R. D. Anderson)	930	March 8, 1911

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
3. **Parcel One:** 160 acres described as follows: S½ SW¼ Sec. 6, T1S, R23W N½ NW¼ Sec. 7, T1S, R23W	960	July 10, 1910
Parcel Two: 80 acres described as follows: SE¼ NW¼ Sec. 7, T1S, R23W SW¼ NE¼ Sec. 7, T1S, R23W	480	November 2, 1904
Parcel Three: 80 acres described as follows: SE¼ SE¼ Sec. 29, T1N, R23W NE¼ NE¼ Sec. 32, T1N, R23W (Claimant: Beaver Land Company, Inc.	480	June 6, 1906
4. 160 acres described as follows: S½ SE¼ Sec. 1, T1S, R24W N½ NE¼ Sec. 12, T1S, R24W (Claimant: Alfred F. Bishop, Louis C. Bishop, Opal I. Ross and Frieda M. Thixton)	480	January 1, 1912

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
5. 10 acres described as follows: SE¼ SE¼ SE¼ Sec. 25, T1S, R24W (Claimant: Louis C. Bishop)	60	December 1908
6. **Parcel One for 160 acres** described as follows: SW¼ SE¼ Sec. 19, T1S, R23W W½ NE¼ Sec. 30, T1S, R23W NW¼ SE¼ Sec. 30 T1S, R23W	480	October 23, 1916
Parcel Two, 160 acres described as follows: N½ NW¼ Sec. 12, T1S, R24W S½ SW¼ Sec. 1, T1S, R24W (Claimant: Robert H. Bishop)	960	December 20, 1911
7. **Parcel One:** 150 acres described as follows: S½ SW¼ Sec. 30, T1S, R23W SW¼ SE¼ Sec. 25, T1S, R24W W½ SE¼ SE¼ Sec. 25, T1S, R24W NE¼ SE¼ SE¼ Sec. 25, T1S, R24W	900	December 1908

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
Parcel Two: 140 acres described as follows: SW¼ NW¼ Sec. 13, T1S, R24W ~~S½~~ SW¼ Sec. 13, T1S, R24W N½ NW¼ NW¼ Sec. 24, T1S, R24W	840	1899
Parcel Three: 20 acres described as follows: N½ NE¼ NE¼ Sec. 23, T1S, R24W	120	November 1900
Parcel Four: 80 acres described as follows: SE¼ SE¼ Sec. 19, T1S, R23W E½ NE¼ Sec. 30, T1S, R23W (Claimant: Robert H. Bishop and Zetta Bishop)	560	June 28, 1917
8. **75 acres described as follows:** NE¼ SW¼ Sec. 19, T1S, R23W S½ NW¼ SE¼ Sec. 19, T1S, R23W NW¼ NW¼ SE¼ Sec. 19, T1S, R23W W½ NE¼ NW¼ SE¼ Sec. 19, T1S, R23W (Claimant: Zetta Bishop)	450	April 13, 1905

	Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
9.	**45 acres described as follows:** NE¼ SE¼ Sec. 20, T1N, R23W That portion of the SE¼ NE¼ of Sec. 20, T1N, R23W lying South of the Colorado River. (Claimant: Emma Crews)	270* *Plus 500 gallons per day for domestic use.	April 3, 1912
10.	**5 acres described as follows:** N½ NW¼ SW¼ NW¼ Sec. 6, T1S, R23W (Claimant: W. L. Chrismer and D. R. Chrismer)	30	March 8, 1911
11.	**20 plus acres described as follows:** W½ NW¼ SW¼ Sec. 21, T1N, R23W The East 611′ of the West 661′ of the SW¼ NW¼ of Sec. 21, T1N, R23W lying South of the Colorado River. (Claimant: Cibola Development Company, Inc.)	122	April 3, 1912

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
12. **10 acres described as follows:** NW¼ SE¼ SW¼ Sec. 29, T1N, R23W (Claimant: Lavequetta Davis)	60	June 6, 1906
13. **40 acres described as follows:** SE¼ SE¼ Sec. 31, T1N, R23W (Claimant: Desert Ginning Company)	240	November 29, 1899
14. **40 acres described as follows:** SE¼ NE¼ Sec. 18, T1S, R23W (Claimant: F. F. Evenson)	90	June 11, 1918
15. **10 acres described as follows:** SE¼ NE¼ Sec. 6, T1S, R23W (Claimant: Kathleen Fitzgerald)	60	November 25, 1912
16. **160 acres described as follows:** S½ SE¼ Sec. 7, T2S, R23W N½ NE¼ Sec. 18, T2S, R23W (Claimant: Joe B. Forehand)	960	February 1896

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
17. **280 acres described as follows:** NW¼ NW¼ Sec. 5, T1S, R23W N½ NE¼ Sec. 6, T1S, R23W NE¼ NW¼ Sec. 6, T1S, R23W S½ SW¼ Sec. 32, T1N, R23W SW¼ SE¼ Sec. 32, T1N, R23W (Claimant: Charles Hart)	1680	November 29, 1899
18. **113.27 acres described as follows:** Lot 3 Sec. 26, T1S, R24W Lot 4 Sec. 26, T1S, R24W Lot 1 Sec. 35, T1S, R24W (Claimant: Sophia V. Hollody, Mary Rogers, and Wallace H. Pike)	680	March 9, 1912
19. **40 acres described as follows:** SW¼ NW¼ Sec. 5, T2S, R23W (Claimant: Ralph J. Machado and Joaquin Machado)	240	February 15, 1913

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
20. **One and a half acres described as follows:** The West 50′ of the SW¼ NW¼ of Sec. 21, T1N, R23W lying South of the Colorado River. (Claimant: Siles Max Mason)	9	April 3, 1912
21. **160 acres described as follows:** S½ SE¼ Sec. 30, T1S, R23W N½ NE¼ Ses. 31, T1S, R23W (Claimant: Clyde L. Moore, Lynn V. Moore and Dean H. Moore)	960	November 10, 1911
22. **80 acres described as follows:** SE¼ NW¼ Sec. 19, T1S, R23W SW¼ NE¼ Sec. 19, T1S, R23W (Claimant: J. L. Myers)	480	April 13, 1905
23. **Parcel One:** 80 acres described as follows: N½ SE¼ Sec. 12, T1S, R24W	480	June 6, 1906
Parcel Two: 40 acres described as follows: NW¼ SW¼ Sec. 7, T1S, R23W	240	June 6, 1906

	Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
	Parcel Three: 80 acres described as follows: NE¼ SW¼ Sec. 7, T1S, R23W NW¼ SE¼ Sec. 7, T1S, R23W (Claimant: John H. Peters, Nall Peters, and Chester A. Peters)	480	November 2, 1904
24.	**150 acres described as follows:** SW¼ SE¼ Sec. 29, T1N, R23W E½ SE¼ SW¼ Sec. 29, T1N, R23W SW¼ SE¼ SW¼ Sec. 29, T1N, R23W NE¼ NW¼ Sec. 32, T1N, R23W NW¼ NE¼ Sec. 32, T1N, R23W (Claimant: June Bailey Pilcher)	900	June 6, 1906
25.	**173.89 acres described as follows:** Lot 3 Sec. 23, T1S, R24W Lot 4 Sec. 23, T1S, R24W E½ SE¼ Sec. 23, T1S, R24W (Claimant: William W. Rogers and Ralph A. Blair)	1044	November 2, 1904

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
26. **Parcel One:** 20 plus acres described as follows: E½ NW ¼ SW¼ Sec. 21 T1N, R23W The East 300′ of the SW¼ NW¼ of Sec. 21, T1N, R23W lying South of the Colorado River.	121	April 13, 1912
Parcel Two: 160 acres described as follows: S½ SW¼ Sec. 21, T1N, R23W N½ NW¼ Sec. 28, T1N, R23W	960	October 3, 1912
Parcel Three: 160 acres described as follows: S½ NW¼ Sec. 28, T1N, R23W N½ SW¼ Sec. 28, T1N, R23W	960	April 22, 1912
Parcel Four: 90 acres described as follows: NW¼ NW¼ Sec. 13, T9S, R21E of the San Bernardino Base & Meridian. That portion of the SW¼ SW¼ of Sec. 12, T9S, R21E of the San Bernardino Base & Meridian, lying South of the Colorado River.	540	February 28, 1919

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
That portion of the NE¼ NE¼ of Sec. 14, T9S, R21E of the San Bernardino Base & Meridian, lying East of the Colorado River.		
Parcel Five: 10 acres described as follows: That portion of the SE¼ SW¼ of Sec. 12, T9S, R21E of the San Bernardino Base & Meridian, lying South of the Colorado River.	60	June 10, 1910
Parcel Six: 105 acres described as follows: E½ NE¼ Sec. 13, T9S, R21E of the San Bernardino Base & Meridian. That portion of the NW¼ NE¼ of Sec. 13, T9S, R21E of the San Bernardino Base & Meridian, lying West of the U.S.A. right of way for the Cibola Channelization Project. (Claimant: Wayne Sprawls and Audrey Sprawls)	630	May 2, 1914

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
27. **320 acres described as follows:** SW¼ SW¼ Sec. 18, T1S, R23W NW¼ NW¼ Sec. 19, T1S, R23W SE¼ SW¼ Sec. 13, T1S, R24W S½ SE¼ Sec. 13, T1S, R24W NE¼ NW¼ Sec. 24, T1S, R24W N½ NE¼ Sec. 24, T1S, R24W (Claimant: Norman L. White)	1920	June 6, 1906
28. **160 acres described as follows:** SE¼ NE¼ Sec. 32, T1N, R23W W½ NW¼ Sec. 33, T1N, R23W NW¼ SW¼ Sec. 33, T1N, R23W SW¼ SW ¼ Sec. 28, T1N, R23W (Claimant: Willauer Investment Company)	960	December 6, 1911

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
29. **320 acres described as follows:** SW¼ NW¼ Sec. 18, T1S, R23W NW¼ SW¼ Sec. 18, T1S, R23W S½ NE¼ Sec. 13, T1S, R24W N½ SE¼ Sec. 13, T1S, R24W SE¼ NW¼ Sec. 13, T1S, R24W NE¼ SW¼ Sec. 13, T1S, R24W (Claimant: T. V. Wissman and E. E. Wissman)	1920	November 29, 1899
30. **Parcel One:** 80 acres described as follows: SE¼ NW¼ Sec. 12, T1S, R24W SE¼ NE¼ Sec. 12, T1S, R24W	480	June 6, 1906
Parcel Two: 80 acres described as follows: SW¼ NE¼ Sec. 12, T1S, R24W SW¼ NW¼ Sec. 7, T1S, R23W (Claimant: A. C. Woodward)	480	June 6, 1906
31. **5 acres described as follows:** E½ NE¼ NW¼ SE¼ Sec. 19, T1S, R23W (Claimant: J. A. Woods and M. A. Woods)	30	April 13, 1905

—87—

MISCELLANEOUS CLAIMANTS

"Present Perfected Rights" to 45,084.52 acre feet of water on the lands described hereinafter with the priority dates as set forth, for Miscellaneous users in the State of Arizona.

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
1. **640 acres described as follows:** S½ Sec. 29; Sec. 30 T16S R22E and portions of N½ of Sec. 25 T16S R21E. San Bernardino Meridian, Yuma County, Arizona. (Claimant: William S. Powers, Estate of Albert Powers and Estate of Joseph F. Powers.)	3,200 AF	1915
2. Lots 3 and 5, Sec. 33 T11NR18W, G&SRB&M (Claimant: Arthur Daniels)	50 AF	1921
3. Lot 2 Sec. 15 T10N R19W Lots 1, 2, 3 Sec. 22 T10N, R 19 W G&SRB&M (Claimant: A. E. Graham)	420 AF	1910

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
4. **181 acres described as follows:** All that part of the East half (E½) of Section Seventeen (17) Township Eight (8) South, Range Twenty-two (22) West of the Gila and Salt River Base and Meridian, lying North and West of the Colorado River according to Survey made by J. W. Scott, Registered Land Surveyor, dated April 1963; EXCEPTING THEREFROM that portion thereof taken by The United States of America on Declaration of Taking in Civil Action No. 1727-Phoenix, in the District Court of the United States in and for the District of Arizona, described as Parcel No. 2 in Judgment on Declaration of Taking recorded February 29, 1952 in Docket 50, page 519, records of Yuma County, Arizona; and	1086 AF	July 10, 1905

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
'EXCEPTING THEREFROM that portion thereof conveyed to Southern Pacific Pipe Lines, Inc., a Delaware Corporation by Warranty Deed recorded February 16, 1956 in Docket 157, page 407, records of Yuma County, Arizona, more particularly described as follows: COMMENCING at the Southwest corner of said Section 17; thence North 0°10½′ West along the West line of Section 17, a distance of 2357.2 feet; thence North 68°09′ East, 2321 feet; thence North 53°49′ East, 1029 feet; thence North 69°29′ East, 1823 feet; thence South 64°54′ East, 165 feet to the point of beginning at the West edge of the Colorado River; thence South 25°06′ West, 100 feet; thence North 64°54′ West 420 feet; thence North 25°06′ East 200 feet; thence South 64°54′ East, 420 feet;		

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
thence South 25°06′ West, 100 feet to the point of beginning. That certain State Lease of approximately 73 acres located in the Southeast quarter of Section 8, Township 8 South, Range 22 West of the Gila & Salt River Base & Meridian, Yuma County, Arizona, and more particularly described in said Lease No. A-1795 with the State Land Department of the State of Arizona. The West half of the Southwest Quarter of Section 9, Township 8 South, Range 22 West of the Gila and Salt River Meridian, Yuma County, Arizona, excepting about 10 acres, more or less, which lie East of the East bank of the Colorado River. (Claimant: Joe Tudor and Fred Gleason)		

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
5. Secs. 1, 2, 13, 14 and 15, Lots 3, 4, and 5 of Sec. 3, T18N R22W; Lots 1, 2, 3 and 4 of E½ of W½ of Sec. 7, T18N, R21W G&SRB&M (Claimant: David W. Hulet and Alice Hulet)	10,404 AF	January 31, 1902 April 24, 1902 September 24, 1902
6. **929.48 acres described as follows:** Sec. 11, Lots 1, 2, 3 and 4 and E½ of SE¼, Sec. 15, T18N R22W (Claimant: J. L. Hurschler and Flora Hurschler)	5,576.88 AF	January 31, 1902 April 24, 1902 Sept. 24, 1902
7. Portion of Sec. 9; All of Sec. 11; W½, N½ NE¼ of Sec. 13; and Portion of Sec. 15. T17N R22W. All of Sec. 7; N½ of Sec. 17; N½ SE¼ of Sec. 17 and SW¼ SE¼ of Sec. 17 T17N R21W. (Claimant: B. O. Miller, Agnes Hale Rindge and The Hollingsworth Corporation)	19,608 AF	1902

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
8. Part of Lot 3, Sec. 21T 11NR18W beg. 250's of NE Cor W 869 to River, N 100' E869' to E line, S 100' to beg. less .16 a hwy r/w (Claimant: Doyle Croft and Mary Croft)	12 AF	1910
9. Secs. 1, 11 and 15, T10N R19W, G&SRB&M Lot 1 Sec. 21T; 10N, R19W G&SRB&M (Claimant: Nellie T. Bush and Joseph E. Bush)	107.52	1894 1904 1916
10. Town of Parker	Aliquot share of the perfected rights of the Colorado River Indian Reservation with the same priority date as the right of said reservation as said right will be presented by the United States pursuant to Article VI of the decree of **Arizona v. California.**	
11. City of Yuma	800 AF	March 1, 1893

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
12. 320 acres described as follows: SE¼ NW¼, SW¼ SE¼, N½ SE¼, and NE¼, all in Section 17, Township 17 North, Range 21 West, Gila and Salt River Base and Meridian, Mohave County, Arizona. In addition, in 1957 the Commission purchased easements for a canal from the Colorado River in the above described lands, and partly constructed much of the canal. Easements for the canal are located to wit: N. 60′ Lot 1, E.60′ W½ and N.60′ of S. 120′ SE¼, Section 7; and N.60′ NW¼ and W.40′ of NE¼ NW¼, Section 17, Township 17 North, Range 21 West. E.60′ Section 25; N.60′ Section 25; S.60′ Section 23; N. 60′ Section 27; and that portion of S.60′ of Section 21 lying east of and bounded on the west by the Colorado River, Township 18 North, Range 22 West. W. 60′ Section 31, Township 18 North, Range 31	1920 AF	1902

Defined Area of Land or Definite Municipal or Industrial Works	Consumptive Use (acre-feet per annum)	Priority Dates
West. E. 60′ Section 1, Township 17 North, Range 22 West.		
(Claimant: Arizona Game and Fish Department for Topock Wildlife Area)		
13. A.	887 AF	1925
Lots 1, 2, and 3 Sec. 1 T2S R24W GSRB&M (118.21 Acres) Lot 7 Sec. 6 T2S R23W (29.58 acres)		
B.	218 AF	1920
Lot 6 Sec. 6 T2S R23W (36.36 acres)		
(Claimant: Arizona Game and Fish Department for Cibola Wildlife Area)		

—97—

SUPPLEMENTAL CLAIM

A Supplemental Claim to 8,000 acre feet of water is also presented on the defined area of land as described. Attention is called to the caveat referring to such claim.

IV. SUPPLEMENTAL CLAIM

Defined Area of Land or Definite Municipal or Industrial Works (as of June 25, 1929)	Consumptive Use (acre-feet per annum)	Priority Dates
Land formerly in California but now in Arizona in Township 5 S., Range 23 and 24 E., Township 6 S., R. 22, 23 and 24 E., Township 7 S., R. 22 and 23 E., and Township 8 S., R. 23 E., San Bernardino Meridian	8,000 Acre Feet	1883
Claimat: (FORREST C. CLAYTON and HELEN CLAYTON, husband and wife, RALPH W. CLAYTON and DEBORAH CLAYTON, husband and wife, and LORRAINE B. CLAYPOOL, formerly LORRAINE B. CLAYTON, wife of JOHN W. CLAYPOOL		
[Caveat: This land was once in California and now is asserted to be located in Arizona. Because of the uncertainty involved the claim is listed as submitted and further verification will be obtained]		

1004

United States Department of the Interior
BUREAU OF RECLAMATION
WASHINGTON, D.C. 20240

APR 12 1973

In Reply Refer To:
400/875.

Dear Mr. Griswold:

Enclosed is a draft of a proposed stipulation that has been informally prepared with participation by all the parties in *Arizona* v. *California*, 373 U. S. 546 (1963). If adopted by the Court, it would climax approximately 9 years of efforts to reach agreement on present perfected rights under Article VI of the Supreme Court Decree of March 9, 1964.

Articles I(G) and (H) of the Decree provide as follows:

> (G) "Perfected right" means a water right acquired in accordance with State law, which right has been exercised by the actual diversion of a specific quantity of water that has been applied to a defined area of land or to definite municipal or industrial works, and in addition shall include water rights created by the reservation of mainstream water for the use of Federal establishments under Federal law whether or not the water has been applied to beneficial use;
>
> (H) "Present perfected rights" means perfected rights, as here defined, existing as of June 25, 1929, the effective date of the Boulder Canyon Project Act;

Present perfected rights of Federal establishments, as listed in Article II(D) of the Decree, include dual limitations on the quantities of water; i.e., (i) the quantities of diversions from the mainstream, or (ii) the quantities of mainstream water necessary to supply the consumptive use required for irrigation of a defined area of land, whichever of (i) or (ii) is less. In

all instances, the Federal establishments listed in Article II(D) are located so that nearly all the diverted water not consumptively used returns to the river at locations where it is available for consumptive use in the United States or for satisfying the Mexican Treaty obligation. There is some time lag on return flows and the sources are sometimes difficult to identify. Nevertheless, the concept of a dual limitation can be administered reasonably well for the Federal establishments along the mainstream.

In attempting to reach agreement among the parties in *Arizona* v. *California* on a stipulation of present perfected rights under Article VI of the Decree, it was emphasized by them that the major irrigation claimants occupy distinctly different hydrological positions as related to return flows to the Colorado River. Except for Palo Verde Irrigation District, any measurements of return flows would be highly inaccurate and impracticable in terms of expressing consumptive use as defined in the Decree. In brief, the various districts' hydrological positions are as follows:

> *Palo Verde Irrigation District* - is immediately adjacent to the Colorado River and essentially all of its diversions not consumed in plant growth or lost by evaporation return eventually to the Colorado River or contribute to stabilization of ground waters. As the ground water is now fairly stable, there is little ground-water movement to the river. From a practical standpoint nearly all of the district's return flow can be measured as surface flows in drains.
>
> *Valley Division, Yuma Project* - is immediately adjacent to the Colorado River and essentially all of its diversions not consumed in plant development or lost by evaporation return to the Colorado River. However, those return flows are intermixed with return flows from the Yuma Mesa Irrigation and Drainage District and from the Yuma Auxiliary Project. Some return flow is to the river above Mexico's point of diversion at Morelos Dam. Other return flow reaches the river in the limitrophe section. Still other return flow is delivered to Mexico at the boundary pumping plant under informal arrangements not covered by the treaty with Mexico or by contract between Mexico and the Yuma County Water Users' Association.

Finally, some return flow from diverted waters crosses the international boundary to Mexico in the ground-water aquifer. This quantity will vary depending on the amount of ground-water pumping in the United States and in Mexico.

Yuma Auxiliary Project - diversions from Imperial Dam are routed through the Gila Gravity Main Canal and the main conveyance system of the Yuma Mesa Irrigation and Drainage District before reaching Yuma Auxiliary Project main canal and lands. Operational losses are apportioned among some five irrigation districts which use all or a part of these facilities. After delivery to farms, water not otherwise consumed percolates into a ground-water mound under the Yuma Mesa. Part of this mound flows eastward into permanent storage; part flows southward in the ground-water aquifer across the international boundary into Mexico; part is pumped and reused by private landowners on the Yuma Mesa; and part flows westward, along with unidentified Yuma Mesa Irrigation and Drainage District ground waters into the Yuma Valley where it is further intermixed with Valley Division return flow before being picked up by pumps or open drains; additionally, some flows northward to the South Gila Valley. There is a great time lag before return flow reaches the river, and it is not possible to accurately separate this district's return flow from that of other districts.

Imperial Irrigation District - the only return flow to the Colorado River is seepage from the approximately 14-mile section of the All-American Canal between Imperial Dam and Pilot Knob Wasteway. All other return flow is to the Salton Sink and not to the Colorado River. From a Decree standpoint, "consumptive use" as defined in Article I(A) is essentially equal to diversions.

Reservation Division, Yuma Project, California (Non-Indian portion - return flow from non-Indian lands is so intermixed with return flow from the All-American Canal that it is difficult to identify accurately the source.

As evapotranspiration for any given crop is essentially the same on all of these projects, the most practical and equitable way to evaluate "reasonable use" is to relate it to diversions. Moreover, the only practical control of reasonable use is by controlling day-to-day diversions. For irrigation this can be accomplished through a system of water scheduling based upon the timing and amounts of water required to replenish the depleted moisture in the plant root zone plus such additional water as required for (1) leaching so as to maintain salt balance and/or (2) to attain a reasonable irrigation efficiency. Part 417 of 43 Code of Federal Regulations contains departmental instructions whereby determinations may be made annually as to the quantity of water reasonably required for beneficial use by each contractor for Colorado River water.

To assure uniform consideration among the claimants of present perfected rights under Article VI of the Decree and as a basis of reaching agreement, the claims based on irrigation have been described in the proposed stipulation in terms of diversion rights.

The claims based on domestic, municipal, and industrial uses and listed in the proposed stipulation are located physically along the river similar to the Federal establishments listed in Article II of the Decree, and are described with the same dual limitations.

The Federal establishments listed in Article II(D) included a number of Indian reservations. The Solicitor's office of this Department has expressed the opinion that while irrigation has been used to quantify the water rights for these reservations, the Indians' use of the water on the reservation is not limited to irrigation. In fact, many of the tribes plan to use the water for domestic, municipal, industrial, and recreational uses. Therefore, the dual limitations for these reservations and for the domestic, municipal, and industrial uses in the proposed stipulation are consistrent.

For convenient reference there is attached a tabulation comparing the rights claimed under Article VI by Arizona, California, and the United States when claims were filed with the Court in 1967, and the rights to which the parties are now prepared to stipulate.

Ltr. to: Mr. Erwin N. Griswold, Subj: Present Perfected Rights

The sum of the proposed stipulation claims, even though the irrigation claims are expressed in terms of diversions, is approximately 300,000 acre-feet per annum less than the claims filed by Arizona and California which were expressed as consumptive use.

The draft stipulation of settlement and a draft of this letter have been reviewed by parties to the suit and by representatives of the five Indian tribes holding present perfected rights under Article II of the Decree. Mr. Frederic L. Kirgis, as attorney for the Colorado River Indian tribe, has approved the drafts subject to the addition of the last paragraph of the proposed stipulation. Mr. Mark Schaffer, attorney for the Chemehuevi tribe also has approved the drafts. In a meeting in Washington, D. C. on February 26 with representatives of the Confederation of Indian Tribes of the Colorado River, Mr. Raymond Simpson, attorney for the Mohave tribe, advised that the Confederation is requesting the Secretary of the Interior to support an up-to-date survey of the resources of all five reservations to determine whether the acreages and related water rights listed in Article II are factual. We also would hope to resolve the reservation boundary questions in the reasonably near future. Initial allocations of funds have been made available to the tribes for these purposes. As soon as you have had an opportunity to review the enclosed material, representatives of the tribes and this Department would like to meet with you to review any ultimate draft of stipulation prior to its submittal to the Court. The Confederation specifically requested that this paragraph be included in this letter of transmittal.

Sincerely yours,

(Sgd) John C. Whitaker

ACTING Secretary of the Interior

Hon. Erwin N. Griswold
Solicitor General
Department of Justice
Washington, D. C. 20530

Enclosure

Regional Director, Boulder City, Nevada (w/encl.)
Chief, Division of Water O&M, E&R Center
Field Solicitor - Riverside, California (w/encl.)
Regional Solicitor - Sacramento, California

MAJOR PRESENT PERFECTED RIGHTS CLAIMS

	Claimed in filings with the Supreme Court (acre-feet)			Now proposed for a stipulated settlement[2]	
	U. S.	California	Arizona	Acre-feet	Priority Date
Imperial Irrigation District		2,806,000[1]		2,600,000[2]	1901
Palo Verde Irrig. Dist.		208,100[1]		;219,780[2]	1877
Reservation Division (Bard Dist.)	39,561[2]	42,325[2]		38,270[2]	7-8-05
Valley Division, Yuma Project	299,852[2]		279,378[1]	254,200[2]	1901
North Gila Valley Unit Yuma Mesa Div., Gila Proj.	31,994[2]		31,840[1]	24,500[2]	7-8-05
Yuma Auxiliary Project (Unit B)	6,801[2]		7,350[1]	6,800[2]	7-8-05
Indian Res. - Arizona[5]	761,562[2]			761,562[2]	various
Cibola Valley Claims - Arizona			27,706[1]	0	
Misc. Claims-Arizona			45,084[13]	10,781[2]	various
Supp'l Claims-Arizona			8,000[1]	0	
Indian Res. - Calif.[5]	131,400[2]			131,400[2]	various
Misc. Claims - Calif.		4,145.7[1 4]		5,001[2]	various
Indian Res. - Nevada[5]	12,534[2]			12,534[2]	Sept. 18, 1890
Lake Mead NRA - Nevada[5]	500[2]			500[2]	May 3, 1929

[1]Consumptive Use.

[2]Diversions.

[3]Does not include four subsequent claims involving a diversion of approximately 3,000 acre-feet per annum.

[4]Does not include 38 subsequent claims involving a diversion of approximately 276 acre-feet per annum.

[5]Federal establishments named in Article II, subdivision (D), paragraphs (1) through (6) of the decree of March 9, 1964.

1/12/73

IN THE

SUPREME COURT OF THE UNITED STATES

October Term 1972

STATE OF ARIZONA,

Complainant,

vs.

STATE OF CALIFORNIA, PALO VERDE IRRIGATION DISTRICT, IMPERIAL IRRIGATION DISTRICT, COACHELLA VALLEY COUNTY WATER DISTRICT, THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, CITY OF LOS ANGELES, CITY OF SAN DIEGO, AND COUNTY OF SAN DIEGO,

Defendants,

UNITED STATES OF AMERICA AND STATE OF NEVADA

Interveners,

STATE OF NEW MEXICO AND STATE OF UTAH,

Impleaded Defendants.

Stipulation of Settlement

Article VI of the Decree entered herein, 376 U.S. 340 provided:

"Within two years from the date of this decree, the States of Arizona, California, and Nevada shall furnish to this Court and to the Secretary of the Interior a list of the present perfected rights, with their claimed priority dates, in waters of the mainstream within each state, respectively, in terms of consumptive use, except those relating to federal establishments. Any named party to this proceeding may present its claim of present perfected rights or its opposition to the claims of others. The Secretary of the Interior shall supply similar information, within a similar period time, with respect to the claims of the United States to present perfected rights within each state. If the parties and the Secretary of the Interior are unable at that time to agree on the present perfected rights to the use of mainstream water in each state, and their priority dates, any party may apply to the Court for the determination of such rights by the Court."

Parties to the suit and the Secretary of the Interior were unable to reach agreement on present perfected rights within the two years set forth in Article VI. Therefore, the States of Arizona, California, and Nevada, and the seven California agencies named in the suit filed a joint motion with the Supreme Court to amend Article VI of the decree so as to postpone for another year (until March 9, 1967) the date on which the parties were required to exchange present perfected rights claims. The United States filed a memorandum with the Supreme Court supporting the motion. On order of the Supreme Court dated February 28, 1966, 383 U.S. 268, Article VI was amended in accordance with said motion.

Parties to the suit and the Secretary of the Interior were unable to reach agreement on present perfected rights prior to the new deadline of March 9, 1967.

Therefore, the United States filed with the Court a list of present perfected rights claimed by the United States. Similarly, the States of Arizona and California each filed a list of present perfected rights claimed in those States. The State of Nevada filed a statement relative to its position on claims of present perfected rights filed by the United States, Arizona, and California under Article VI of the decree. These parties have continued since that time to assemble and exchange information.

For purposes of settling claims of present perfected rights filed in this action, the parties now stipulate and agree to the present perfected rights and respective priority dates within each State in waters of the Colorado River listed herein. The following relate only to the quantity of water which may be used by each claimant and are not intended to limit or redefine the type of use otherwise allowed by the decree.

Arizona

The Federal establishments named in Article II, subdivision (D), paragraphs (2) (4), and (5), of the decree of March 9, 1964, such rights having been decreed in Article II:

Defined Area of Land	Annual Diversions (acre-feet)[1]	Net Acres[1]	Priority Date
Fort Mohave Indian	27,969	4,327	Sept. 18, 1890
Reservation	68,447	10,589	Feb. 2, 1911
Cocopah Indian Reservation	2,744	431	Sept. 27, 1917
Colorado River Indian	358,400	53,768	Mar. 3, 1865
Reservation	252,016	37,808	Nov. 22, 1873
	51,986	7,799	Nov. 16, 1874

[1]According to the terms of the decree, the quantity of water in each instance is measured by (1) diversions or (ii) consumptive use required for irrigation of the respective acreage, and for satisfaction of related uses, which ever of (i) or (ii) is less.

The Valley Division, Yuma Project, in annual quantities of water not to exceed 254,200 acre-feet of diversions from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the boundaries of the Valley Division, Yuma Project, with a priority date of 1901.

The Yuma Auxiliary Project, Unit B, in annual quantities of water not to exceed 6,800 acre-feet of diversions from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the Yuma Auxiliary Project, Unit B, with a priority date of July 8, 1905.

The North Gila Valley Unit, Yuma Mesa Division, Gila Project, in annual quantities of water not to exceed 24,500 acre-feet of diversions from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the boundaries of the North Gila Valley Unit, Yuma Mesa Division, with a priority date of July 8, 1905.

The following claims in Arizona in annual quantities of water not to exceed the listed acre-feet of diversion from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the boundaries of the land described and with the priority dates listed:

Defined Area of Land	Annual Diversions (acre-feet)	Priority Date
160 acres in Lots 21, 24, and 25, Sec. 29 and Lots 15, 16, 17, and 18, and the SW1/4 of the SE1/4, Sec. 30, T. 16S., R. 22E., San Bernandino Base and Meridian, Yuma County, Arizona (Powers)[1]	960	1915
Lots 11, 12, 13, 19, 20, 22 and S1/2 of SW1/4, Sec. 30, T. 16S., R. 22E., San Bernandino Base and Meridian Yuma County, Arizona (United States[3])	1,140	1915
60 acres within Lot 2, Sec. 15 and Lots 1 and 2, Sec. 22, T. 10N., R. 19W., G&SRBM. (Graham)[1]	360	1910
180 acres within the N1/2 of the S1/2, and the S1/2 of the N1/2 of Sec. 13 and the SW1/4 of the NE1/2 of Sec. 14, T. 18N., R. 22W., G&SRBM. (Hulet)[1]	1,080	1902
45 acres within the NE1/4 of the SW1/4, the SW1/4 of the SW1/4 and the SE1/4 of the SW1/4 of Sec. 11, T. 18N., R. 22W., G&SRBM.	1,050	1902
80 acres within the N1/2 of the SW1/4 of Sec. 11, T. 18N., R. 22W., G&SRBM.		
10 acres within the NW1/4 of the NE1/4 of the NE1/4 of Sec. 15, T. 18N., R. 22W., G&SRBM.		
40 acres within the SE1/4 of the SE1/4 of Sec. 15, T. 18N., R. 22W., G&SRBM. (Hurschler)[1]		
40 acres within Sec. 13, T. 17N., R. 22W., G&SRBM. (Miller)[1]	240	1902

Defined Area of Land	Annual Diversions (acre-feet)	Priority Date
120 acres within Sec. 27, T. 18N., R. 21W., G&SRBM.	810	1902
15 acres within the NW¼ of the NW¼, Sec. 23, T. 18N., R. 22W., G&SRBM. (Mckellips and Granite Reef Farms)[2]		
180 acres within the NW¼ of the NE¼, the SW¼ of the NE¼, the NE¼ of the SW¼, the NW¼ of the SE¼, the NE¼ of the SE¼, and the SW¼ of the SE¼, and the SE¼ of the SE¼, Sec. 31, T. 18N., R. 21W., G&SRBM. (Sherrill & Lafollette)[2]	1,080	1902
53.89 acres as follows: Beginning at a point 995.1 feet easterly of the NW corner of the NE¼ of Sec. 10, T. 8S., R. 22W., Gila and Salt River Base and Meridian; on the northerly boundary of the said NE¼, which is the true point of beginning, then in a southerly direction to a point on the southerly boundary of the said NE¼ which is 991.2 feet E. of the SW corner of said NE¼ thence easterly along the S. line of the NE¼, a distance of 807.3 feet to a point, thence N. 0°7′ W., 768.8 feet to a point, thence E. 124.0 feet to a point, thence northerly 0°14′ W., 1,067.6 feet to a point, thence E. 130 feet to a point, thence northerly 0°20′ W., 405.2 feet to a point, thence northerly 63°10′ W., 506.0 feet to a point, thence northerly 90°15′ W., 562.9 feet to a point on the northerly boundary of the said NE¼, thence easterly along the said northerly boundary of the said NE¼, 116.6 feet to the true point of the beginning containing 53.89 acres. All as more particularly described and set forth in that survey executed by Thomas A. Yowell, Land Surveyor on June 24, 1969. (Molina)[2]	318	1928
60 acres within the NW¼ of the NW¼ (and the north half of the SW¼ of the NW¼ of Sec. 14, T. 8S., R. 22W., G&SRBM.	780	1925

Defined Area of Land	Annual Diversions (acre-feet)	Priority Date
70 acres within the S½ of the SW¼ of the SW¼, and the W½ of the SW¼, Sec. 14, T. 8S., R. 22W., G&SRBM. (Sturges)[2]		

[1]The names in parenthesis following the description of the "Defined Area of Land" are used for identification of claims only; the name used is the first name appearing in the Claimants identified with a parcel in Arizona's 1967 submission to the Supreme Court.
[2]The names in parenthesis following the description of the "Defined Area of Land" are the names of Claimants added since the 1967 list, upon whose water use these claims are predicated.
[3]Included as a part of the Powers' claim in Arizona's 1967 submittal to the Supreme Court. Subsequently the United States and Powers have agreed to a stipulation of Settlement on land ownership under which title to this property is being quieted in favor of the United States.

The following claims in Arizona in annual quantities of water not to exceed the listed number of acre-feet of (i) diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use, whichever of (i) or (ii) is less, for domestic, municipal, and industrial purposes within the boundaries of the land described and with the priority dates listed:

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use (acre-feet)	Priority Use
City of Parker	630	400	1905
City of Yuma	2,333	1,478	1893

California

The Federal establishments named in Article II, subdivision (D). paragraphs (1), (3), (4), and (5) of the decree of March 9, 1964, such rights having been decreed by Article II:

Defined Area of Land	Annual Diversions (acre-feet)[1]	Net Acres[1]	Priority Date
Yuma Indian Reservation	51,616	7,743	Jan. 9, 1884
Fort Mohave Indian Reservation	13,698	2,119	Sept. 18, 1890
Chemehuevi Indian Reservation	11,340	1,900	Feb. 2, 1907
Colorado River Indian Reservation	10,745	1,612	Nov. 22, 1873
	40,241	6,037	Nov. 16, 1874
	3,760	564	May 15, 1876

[1]According to the terms of the decree, the quantity of water in each instance is measured by (i) diversions or (ii) consumptive use required for irrigation of the respective acreage, and for satisfaction of related uses, which ever of (i) and (ii) is less.

The Palo Verde Irrigation District in annual quantities of water not to exceed 219,780 acre-feet of diversions from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the boundaries of the Palo Verde Irrigation District, with a priority date of 1877.

The Imperial Irrigation District in annual quantities of water not to exceed 2,600,000 acre-feet of diversions from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the boundaries of the Imperial Irrigation District, with a priority date of 1901.

The Reservation Division, Yuma Project, California (Non-Indian portion) in annual quantities of water not to exceed 38,270 acre-feet of diversions from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the boundaries of the Reservation Division, Yuma Project, California (Non-Indian portion) with a priority date of July 8, 1905.

The following claims in California in annual quantities of water not to exceed the listed number of acre-feet of diversions from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the boundaries of the land described and with the priority dates listed:

Defined Area of Land	Annual Diversions (acre-feet)	Priority Date
Portions of: Lots 1, 2, and 3, SE¼ of NE¼ of Section 27 T. 16S., R. 22E., S.B.B. & M. (Wavers)[1]	780	1856
W½, W½ of E½ of Section 1, T. 9N., R. 22E., S.B.B. & M. (Stephenson)[1]	240	1923
Portions of: Lots 1 and 2, Sec. 19 T. 13S., R. 23E., and Lots 2, 3, and 4 of Sec. 24, T. 13S., R. 22E., S.B.B. & M. (Mendivil)[1]	120	1893
NW¼ of SE¼, S½ of SE¼, Sec. 24, and NW¼ of NE¼ Sec. 25, all in T. 9S., R. 21E., S.B.B. & M. (Grannis)[1]	180	1928
Lot 6, Sec. 5; and Lots 1 and 2, SW¼ of NE¼, and NE¼ of SE¼ of Sec. 8 and Lots 1 and 2 of Sec. 9, all in R. 13S., R. 22E., S.B.B. & M. (Morgan)[1]	150	1913
E½ of NW¼ and W½ of NE¼ of Sec. 14, T. 10S, R. 21E., S.B.B. & M. (Milpitas)[1]	108	1918
Portions of: N½ of NE¼, SE¼ of NE¼, and NE¼ of SE¼, Sec. 30, T. 9N., R. 23E., S.B.B. & M. (Simons)[1]	60	1889

Defined Area of Land	Annual Diversions (acre-feet)	Priority Date
E½ of NW¼ and N½ of SW¼, Sec. 12, T. 9N., R. 22E., S.B.B. & M. (Colo. R. Sportmen's League)[1]	96	1921
E½ of NW¼, Sec. 1 T. 10S., R. 21E., S.B.B. & M. (Milpitas)[1]	69	1914
S½ of SW¼, Sec. 12 T. 9N., R. 22E., S.B.B. & M. (Andrade)[1]	66	1921
Lots 2, 3, and 7 and NE¼ of SW¼, Sec. 19, T. 9N, R. 23E., S.B.B. & M. (Reynolds)[1]	36	1904
N½ of NE¼, SE¼ of NE¼ and NE¼ of SE¼, Sec. 24 T. 9N., R. 22E., S.B.B. & M. (Cooper)[1]	60	1905
SW¼ of SW¼, (Lot 8) Sec. 19, T. 9N., R. 23E., S.B.B. & M. (Chagnon)[2]	120	1925
NE¼ of SW¼, N½ of SE¼, SE¼ of SE¼, Sec. 14, T. 9S., R. 21E., S.B.B. & M. (Lawrence)[2]	120	1915

[1]The names in parenthesis following the description of the "Defined Area of Land" are used in identification of claims only; the name used is the first name appearing in the claimants identified with a parcel in California's 1967 list.
[2]The names in parenthesis following the description of the "Defined Area of Land" are the names of the homesteaders upon whose water use these claims, added since the 1967 list, are predicated.

The following claimants in California in annual quantities of water not to exceed the listed number of acre-feet of (i) diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use, whichever of (i) or (ii) is less, for domestic, municipal, and industrial purposes within the boundaries of the land described and with the priority dates listed:

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use (acre-feet)	Priority Use
Within boundaries of City of Needles[1]	1,500	950	1885
Portions of: Secs. 5, 6, 7 & 8, T. 7N., R. 24E.; Sec. 1, T. 7N., R. 23E.; Secs. 4, 5, 9, 10, 15, 22, 23, 25, 26, 35, & 36, T. 8N., R.	1,260	273	1896

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use (acre-feet)	Priority Use
23E.; Secs. 19, 29, 30, 32 & 33, T. 9N., R. 23E., S.B.B. & M. (Atcheson, Topeka and Santa Fe Railway Co.)[1]			
Lots 1, 2, 3, 4, 5, & SW1/4 NW1/4 of Sec. 5, T. 13S., R. 22E., S.B.B. & M. (Conger)[2]	1.0	0.6	1921
Lots 1, 2, 3, 4 of Sec. 32 T. 11S., R. 22E., S.B.B. & M. (G. Draper)[2]	1.0	0.6	1923
Lots 1, 2, 3, 4, and SE1/4 SW1/4 of Sec. 20 T. 11S., R. 22E., S.B.B. & M. (McDonough)[2]	1.0	0.6	1919
SW1/4 of Sec. 25, T. 8S., R. 22E., S.B.B. & M. (Faubion)[2]	1.0	0.6	1925
W1/2 NW1/4 of Sec. 12, T. 9N., R. 22E., S.B.B. & M. (Dudley)[2]	1.0	0.6	1922
N1/2 SE1/4 and Lots 1 and 2 of Sec. 13, T. 8S., R. 22E., S.B.B. & M. (Douglas)[2]	1.0	0.6	1916
N1/2 SW1/4, NW1/4 SE1/4, Lots 6 and 7, Sec. 5, T. 9S., R. 22E., S.B.B. & M. (Beauchamp)[2]	1.0	0.6	1924
NE1/4 SE1/4, SE1/4 NE1/4, and Lot 1, Sec. 26, T. 8S., R. 22E., S.B.B. & M. (Clark)[2]	1.0	0.6	1916
N1/2 SW1/4, NW1/4 SE1/4, SE1/4 NE1/4, Sec. 13, T. 9S., R. 21E., S.B.B. & M. (Lawrence)[2]	1.0	0.6	1915
N1/2 NE1/4, E1/2 NW1/4, Sec. 13, T. 9S., R. 21E., S.B.B. & M. (J. Graham)[2]	1.0	0.6	1914
SE1/4, Sec. 1, T. 9S., R. 21E., S.B.B. & M. (Geiger)[2]	1.0	0.6	1910

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use (acre-feet)	Priority Use
Fractional W1/2 of SW1/4 (Lot 6) Sec. 6, T. 9S., R. 22E., S.B.B. & M. (Schneider)[2]	1.0	0.6	1917
Lot 1, Sec. 15; Lots 1 & 2, Sec. 14; Lots 1 & 2, Sec. 23; all in T. 13S., R. 22E., S.B.B. & M. (Martinez)[2]	1.0	0.6	1895
NE1/4, Sec. 22, T. 9S., R. 21E., S.B.B. & M. (Earle)[2]	1.0	0.6	1925
NE1/4 SE1/4, Sec. 22, T. 9S., R. 21E., S.B.B. & M. (Diehl)[2]	1.0	0.6	1928
N1/2 NW1/4, N1/2 NE1/4, Sec. 23, T. 9S., R. 21E., S.B.B. & M. (Reid)[2]	1.0	0.6	1912
W1/2 SW1/4, Sec. 23, T. 9S., R. 21E., S.B.B. & M. (Grahman)[2]	1.0	0.6	1916
S1/2 NW1/4, NE1/4 SW1/4, SW1/4 NE1/4, Sec. 23, T. 9S., R. 21E., S.B.B. & M. (Cate)[2]	1.0	0.6	1919
SE1/4 NE1/4, N1/2 SE1/4, SE1/4 SE1/4, Sec. 23, T. 9S., R. 21E., S.B.B. & M. (McGee)[2]	1.0	0.6	1924
SW1/4 SE1/4, SE1/4 SW1/4, Sec. 23, NE1/4 NW1/4, NW1/4 NE1/4, Sec. 26; all in T. 9S., R. 21E., S.B.B. & M. (Stallard)[2]	1.0	0.6	1924
W1/2 SE1/4, SE1/4 SE1/4, Sec. 26, T. 9S., R. 21E., S.B.B. & M. (Randolph)[2]	1.0	0.6	1926
E1/2 NE1/4, SW1/4 NE1/4, SE1/4 NW1/4, Sec. 26, T. 9S., R. 21E., S.B.B. & M. (Stallard)[2]	1.0	0.6	1928
S1/2 SW1/4, Sec. 13, N1/2 NW1/4, Sec. 24; all in T. 9S., R. 21E., S.B.B. & M. (Keefe)[2]	1.0	0.6	1926

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use (acre-feet)	Priority Use
SE¼ NW¼, NW¼ SE¼, Lots 2, 3, & 4, Sec. 25, T. 13S., R. 23E., S.B.B. & M. (C. Ferguson)[2]	1.0	0.6	1903
Lots 4 & 7, Sec. 6; Lots 1 2, Sec. 7; all in T. 14S., R. 24E., S.B.B. & M. (W. Ferguson)[2]	1.0	0.6	1903
SW¼ SE¼, Lots 2, 3, and 4, Sec. 24, T. 12S., R. 21E., Lot 2, Sec. 19, T. 12S., R. 22E., S.B.B. & M. (Vaulin)[2]	1.0	0.6	1920
Lots 1, 2, 3, and 4, Sec. 25 T. 12S., R. 21E., S.B.B. & M. (Salisbury)[2]	1.0	0.6	1920
Lots 2, 3, SE¼ SE¼, Sec. 15, NE¼ NE¼, Sec. 22; all in T. 13S., R. 22E., S.B.B. & M. (Hadlock)[2]	1.0	0.6	1924
SW¼ NE¼, SE¼ NW¼, and Lots 7 & 8, Sec. 6, T. 9S., R. 22E., S.B.B. & M. (Streeter)[2]	1.0	0.6	1903
Lot 4, Sec. 5, Lots 1 & 2, Sec. 7, Lots 1 & 2, Sec. 8, Lot 1, Sec. 18; all in T. 12S., R. 22E., S.B.B. & M. (J. Draper)[2]	1.0	0.6	1903
SW¼ NW¼, Sec. 5, SE¼ NE¼ and Lot 9, Sec. 6; all in T. 9S., R. 22E., S.B.B. & M. (Fitz)[2]	1.0	0.6	1912
NW¼ NE¼, Sec. 26; Lots 2 & 3, W½ SE¼, Sec. 23; all in T. 8S., R. 22E., S.B.B. & M. (Williams)[2]	1.0	0.6	1909
Lots 1, 2, 3, 4, & 5, Sec. 25 T. 8S., R. 22E., S.B.B. & M. (Estrada)[2]	1.0	0.6	1928
S½ NW¼, Lot 1, frac. NE¼ SW¼, Sec. 25, T. 9S., R. 21E., S.B.B. & M. (Whittle)[2]	1.0	0.6	1925

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use (acre-feet)	Priority Use
N½ NW¼, Sec. 25, S½ SW¼, Sec. 24; all in T. 9S., R. 21E., S.B.B. & M. (Corington)[2]	1.0	0.6	1928
S½ NW¼, N½ SW¼, Sec. 24, T. 9S., R. 21S., S.B.B. & M. (Tolliver)[2]	1.0	0.6	1928

[1]The names in parenthesis following the description of the "Defined Area of Land" are used for identification of claims only; the name used in the first name appearing in the claimants identified with a parcel in California's 1967 list.

[2]The names in parenthesis following the description of the "Defined Area of Land" are the names of the homesteaders upon whose water use these claims, added since the 1967 list, are predicated.

Nevada

The Federal establishments named in Article II, subdivision (D), paragraphs (5) and (6) of the decree of March 9, 1964, such rights having been decreed by Article II:

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use	Priority Date
Lake Mead National Recreation Area (The Overton Area of Lake Mead N.R.A. provided in Executive Order 5105)	500	300 acre feet	May 3, 1929[1]
Fort Mohave Indian Reservation	12,534[2]	1,939 acres[2]	Sept. 18, 1890

This stipulation shall in no way affect future adjustments resulting from determinations relating to settlement of Indian reservation boundaries referred to in Article II(D) (5) of the decree. Likewise Article IX of the decree is not affected by this stipulation of settlement.

[1]Article II(D) (6) of the decree specifies a priority date of March 3, 1929. Executive Order 5105 is dated May 3, 1929 (see 3 C.F.R., 1964 Cumulative Pocket Supplement, Page 276, and the Findings of Fact and Conclusions of Law of the Special Master's Report pp. 294-295.)

[2]According to the terms of the decree, the quantity of waters in each instance is measured by (i) diversions or (ii) consumptive use required for irrigation of the respective acreage, and for satisfaction of related uses, which ever of (i) or (ii) is less.

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No. 8, Orig.

State of Arizona, Plaintiff, v. State of California et al. | On Joint Motion to Enter Supplemental Decree and Motions for Leave to Intervene.

[January 9, 1979]

PER CURIAM.

The United States of America, Intervenor, State of Arizona, Complainant, the California Defendants (State of California, Palo Verde Irrigation District, Imperial Irrigation District, Coachella Valley County Water District, The Metropolitan Water District of Southern California, City of Los Angeles, City of San Diego, County of San Diego), and State of Nevada, Intervenor, pursuant to Art. VI of the Decree entered in the case on March 9, 1964, at 376 U. S. 340, and amended on February 28, 1966, at 383 U. S. 268, have agreed to the present perfected rights to the use of mainstream water in each State and their priority dates as set forth herein. Therefore, it is hereby ORDERED, ADJUDGED, AND DECREED that the joint motion of the United States, the State of Arizona, the California Defendants, and the State of Nevada to enter a supplemental decree is granted and that said present perfected rights in each State and their priority dates are determined to be as set forth below, subject to the following:

(1) The following listed present perfected rights relate to the quantity of water which may be used by each claimant and the list is not intended to limit or redefine the type of use otherwise set forth in said Decree.

(2) This determination shall in no way affect future adjustments resulting from determinations relating to settlement of Indian reservation boundaries referred to in Art. II (D)(5) of said Decree.

(3) Article IX of said Decree is not affected by this list of present perfected rights.

(4) Any water right listed herein may be exercised only for beneficial uses.

(5) In the event of a determination of insufficient mainstream water to satisfy present perfected rights pursuant to Art. II (B)(3) of said Decree, the Secretary of the Interior shall, before providing for the satisfaction of any of the other present perfected rights except for those listed herein as "MISCELLANEOUS PRESENT PERFECTED RIGHTS" (rights numbered 7–21 and 29–80 below) in the order of their priority dates without regard to State lines, first provide for the satisfaction in full of all rights of the Chemehuevi Indian Reservation, Cocopah Indian Reservation, Fort Yuma Indian Reservation, Colorado River Indian Reservation, and the Fort Mojave Indian Reservation as set forth in Art. II (D)(1)–(5) of said Decree, provided that the quantities fixed in paragraphs (1) through (5) of Art. II (D) of said Decree shall continue to be subject to appropriate adjustment by agreement or decree of this Court in the event that the boundaries of the respective reservations are finally determined. Additional present perfected rights so adjudicated by such adjustment shall be in annual quantities not to exceed the quantities of mainstream water necessary to supply the consumptive use required for irrigation of the practicably irrigable acres which are included within any area determined to be within a reservation by such final determination of a boundary and for the satisfaction of related uses. The quantities of diversions are to be computed by determining net practicably irrigable acres within each additional area using the methods set forth by the Special Master in this case in his Report to this Court dated December 5, 1960, and by applying the unit diversion quantities thereto, as listed below:

Indian Reservation	Unit Diversion Quantity Acre-Feet Per Irrigable Acre
Cocopah	6.37
Colorado River	6.67
Chemehuevi	5.97
Ft. Mojave	6.46
Ft. Yuma	6.67

The foregoing reference to a quantity of water necessary to supply consumptive use required for irrigation, and as that provision is included within paragraphs (1) through (5) of Art. II (D) of said Decree, shall constitute the means of determining quantity of adjudicated water rights but shall not constitute a restriction of the usage of them to irrigation or other agricultural application. If all or part of the adjudicated water rights of any of the five Indian Reservations is used other than for irrigation or other agricultural application, the total consumptive use, as that term is defined in Art. I (A) of said Decree, for said Reservation shall not exceed the consumptive use that would have resulted if the diversions listed in subparagraph (i) of paragraphs (1) through (5) of Art. II (D) of said Decree and the equivalent portions of any supplement thereto had been used for irrigation of the number of acres specified for that Reservation in said paragraphs and supplement and for the satisfaction of related uses. Effect shall be given to this paragraph notwithstanding the priority dates of the present perfected rights as listed below. However, nothing in this paragraph (5) shall affect the order in which such rights listed below as "MISCELLANEOUS PRESENT PERFECTED RIGHTS" (numbered 7–21 and 29–80 below) shall be satisfied. Furthermore, nothing in this paragraph shall be construed to determine the order of satisfying any other Indian water rights claims not herein specified.

I

ARIZONA

A. Federal Establishments Present Perfected Rights

The federal establishments named in Art. II, subdivision (D), paragraphs (2), (4) and (5), of the Decree entered March 9, 1964, in this case, such rights having been decreed in Art. II:

Defined Area of Land	Annual Diversions (acre-feet) [1]	Net Acres [1]	Priority Date
1) Cocopah Indian Reservation	2,744	431	Sept. 27, 1917
2) Colorado River Indian Reservation	358,400	53,768	Mar. 3, 1865
	252,016	37,808	Nov. 22, 1873
	51,986	7,799	Nov. 16, 1874
3) Fort Mojave Indian Reservation	27,969	4,327	Sept. 18, 1890
	68,447	10,589	Feb. 2, 1911

B. Water Projects Present Perfected Rights

(4) *The Valley Division, Yuma Project* in annual quantities not to exceed (i) 254,200 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 43,562 acres and for the satisfaction of related uses, whichever

[1] The quantity of water in each instance is measured by (i) diversions or (ii) consumptive use required for irrigation of the respective acreage and for the satisfaction of related uses, whichever of (i) or (ii) is less.

of (i) or (ii) is less, with a priority date of 1901.

(5) *The Yuma Auxiliary Project, Unit B* in annual quantities not to exceed (i) 6,800 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 1,225 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of July 8, 1905.

(6) *The North Gila Valley Unit, Yuma Mesa Division, Gila Project* in annual quantities not to exceed (i) 24,500 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 4,030 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of July 8, 1905.

C. Miscellaneous Present Perfected Rights

1. The following miscellaneous present perfected rights in Arizona in annual quantities of water not to exceed the listed acre-feet of diversion from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the boundaries of the land described and with the priority dates listed:

Defined Area of Land	Annual Diversions (acre-feet)	Priority Date
7) 160 acres in Lots 21, 24, and 25, Sec. 29 and Lots 15, 16, 17 and 18, and the SW¼ of the SE¼, Sec. 30, T.16S., R.22E., San Bernardino Base and Meridian, Yuma County, Arizona (Powers) [2]	960	1915
8) Lots 11, 12, 13, 19, 20, 22 and S½ of SW¼, Sec. 30, T.16S., R.22E., San Bernardino Base and Meridian, Yuma County, Arizona. (United States) [3]	1,140	1915
9) 60 acres within Lot 2, Sec. 15 and Lots 1 and 2, Sec. 22, T.10N., R.19W, G&SRBM. (Graham) [2]	360	1910
10) 180 acres within the N½ of the S½ and the S½ of the N½ of Sec. 13 and the SW¼ of the NE¼ of Sec. 14, T.18N., R.22W., G&SRBM. (Hulet) [2]	1,050	1902
11) 45 acres within the NE¼ of the SW¼, the SW¼ of the SW¼ and the SE¼ of the SW¼ of Sec. 11, T.18N., R.22W., G&SRBM. 80 acres within the N½ of the SW¼ of Sec. 11, T.18N., R.22W., G&SRBM. 10 acres within the NW¼ of the NE¼ of the NE¼ of Sec. 15, T.18N., R.22W., G&SRBM. 40 acres within the SE¼ of the SE¼ of Sec. 15, T.18N., R.22W., G&SRBM. (Hurschler) [2]	1,050	1902
12) 40 acres within Sec. 13, T.17N., R.22W., G&SRBM. (Miller) [2]	240	1902
13) 120 acres within Sec. 27, T.18N., R.21W., G&SRBM. 15 acres within the NW¼ of the NW¼, Sec. 23, T.18N., R.22W., G&SRBM. (McKellips and Granite Reef Farms) [4]	810	1902
14) 180 acres within the NW¼ of the NE¼, the SW¼ of the NE¼, the NE¼ of the SW¼, the NW¼ of the SE¼, the NE¼ of the SE¼, and the SW¼ of the SE¼, and the SE¼ of the SE¼, Sec. 31, T.18N., R.21W., G&SRBM. (Sherrill & Lafollette) [4]	1,080	1902
15) 53.89 acres as follows: Beginning at a point 995.1 feet easterly of the NW corner of the NE¼ of Sec. 10, T.8S., R.22W., Gila and Salt River Base and Meridian; on the northerly boundary of the said NE¼, which is the true point of beginning, then in a southerly direction to a point on the southerly boundary of the said NE¼ which is 991.2 feet E. of the SW corner of said NE¼ thence easterly along the S. line of the NE¼, a distance of 807.3 feet to a point, thence N. 0°7' W., 768.8 feet to a point, thence E. 124.0 feet to a point, thence northerly 0°14' W., 1,067.6 feet to a point, thence E. 130 feet to a point, thence northerly 0°20' W., 405.2 feet to a point, thence northerly 63°10' W., 506.0 feet to a point, thence northerly 90°15' W., 562.9 feet to a point on the northerly boundary of the said NE¼, thence easterly along the said northerly boundary of the said NE¼, 116.6 feet to the true point of the beginning containing 53.89 acres. All as more particularly described and set forth in that survey executed by Thomas A. Yowell, Land Surveyor on June 24, 1969. (Molina) [4]	318	1928
16) 60 acres within the NW¼ of the NW¼ and the north half of the SW¼ of the NW¼ of Sec. 14, T.8S., R.22W., G&SRBM. 70 acres within the S½ of the SW¼ of the SW¼, and the W½ of the SW¼, Sec. 14, T.8S., R.22W., G&SRBM. (Sturges) [4]	780	1925
17) 120 acres within the N½ NE¼, NE¼ NW¼, Section 23, T.18N., R.22W., G&SRBM. (Zozaya) [4]	720	1912
18) 40 acres in the W½ of the NE¼ of Section 30, and 60 acres in the W½ of the SE¼ of Section 30, and 60 acres in the E½ of the NW¼ of Section 31, comprising a total of 160 acres all in Township 18 North, Range 21 West of the G&SRBM. (Swan) [4]	960	1902
19) 7 acres in the East 300 feet of the W½ of Lot 1 (Lot 1, being the SE¼ SE¼, 40 acres more or less), Section 28, Township 16 South, Range 22 East, San Bernardino Meridian, lying North of U. S. Bureau of Reclamation levee right of way. EXCEPT that portion conveyed to the United States of America by instrument recorded in Docket 417, page 150 EXCEPTING any portion of the East 300 feet of W½ of Lot 1 within the natural bed of the Colorado River below the line of ordinary high water and also EXCEPTING any artificial accretions waterward of said line of ordinary high water, all of which comprises approximately seven (7) acres. (Milton and Jean Phillips) [4]	42	1900

[2] The name in parentheses following the description of the "Defined Area of Land" are used for identification of present perfected rights only; the name used is the first name appearing as the Claimants identified with a parcel in Arizona's 1967 list submitted to this Court.

[3] Included as a part of the Powers' claim in Arizona's 1967 list submitted to this Court. Subsequently, the United States and Powers agreed to a Stipulation of Settlement on land ownership whereby title to this property was quieted in favor of the United States.

[4] The names in parentheses following the description of the "Defined Area of Land" are the names of claimants, added since the 1967 list, upon whose water use these present perfected rights are predicated.

2. The following miscellaneous present perfected rights in Arizona in annual quantities of water not to exceed the listed number of acre-feet of (i) diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use, whichever of (i) or (ii) is less, for domestic, municipal, and industrial purposes within the boundaries of the land described and with the priority dates listed:

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use (acre-feet)	Priority Date
20) City of Parker [2]	630	400	1905
21) City of Yuma [2]	2,333	1,478	1893

II

CALIFORNIA

A. Federal Establishments Present Perfected Rights

The federal establishments named in Art. II, subdivision (D), paragraphs (1), (3), (4), and (5) of the Decree entered March 9, 1964, in this case such rights having been decreed by Art. II:

Defined Area of Land	Annual Diversions (acre-feet) [3]	Net Acres [5]	Priority Date
22)			
Chemehuevi Indian Reservation	11,340	1,900	Feb. 2, 1907
23)			
Yuma Indian Reservation	51,616	7,743	Jan. 9, 1884
24)			
Colorado River Indian Reservation	10,745	1,612	Nov. 22, 1873
	40,241	6,037	Nov. 16, 1874
	3,760	564	May 15, 1876
25)			
Fort Mojave Indian Reservation	13,698	2,119	Sept. 18, 1890

B. Water Districts and Projects Present Perfected Rights

26) *The Palo Verde Irrigation District* in annual quantities not to exceed (i) 219,780 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 33,604 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of 1877.

27) *The Imperial Irrigation District* in annual quantities not to exceed (i) 2,600,000 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 424,145 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of 1901.

28) *The Reservation Division, Yuma Project, California* (non-Indian portion) in annual quantities not to exceed (i) 38,270 acre-feet of diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use required for irrigation of 6,294 acres and for the satisfaction of related uses, whichever of (i) or (ii) is less, with a priority date of July 8, 1905.

C. Miscellaneous Present Perfected Rights

1. The following miscellaneous present perfected rights in California in annual quantities of water not to exceed the listed number of acre-feet of diversions from the mainstream to supply the consumptive use required for irrigation and the satisfaction of related uses within the boundaries of the land described and with the priority dates listed:

Defined Area of Land	Annual Diversions (acre-feet)	Priority Date
29)		
130 acres within Lots 1, 2, and 3, SE¼ of NE¼ of Section 27, T.16S., R.22E., S.B.B. & M. (Wavers) [4]	780	1856
30)		
40 acres within W½, W½ of E½ of Section 1, T.9N., R.22E., S.B.B. & M. (Stephenson) [4]	240	1923
31)		
20 acres within Lots 1 and 2, Sec. 19, T.13S., R.23E., and Lots 2, 3, and 4 of Sec. 24, T.13S., R.22E., S.B.B. & M. (Mendivil) [4]	120	1893
32)		
30 acres within NW¼ of SE¼, S½ of SE¼, Sec. 24, and NW¼ of NE¼, Sec. 25, all in T.9S., R.21E., S.B.B. & M. (Grannis) [4]	180	1928
33)		
25 acres within Lot 6, Sec. 5; and Lots 1 and 2, SW¼ of NE¼, and NE¼ of SE¼ of Sec. 8, and Lots 1 & 2 of Sec. 9, all in T.13S., R.22E., S.B.B. & M. (Morgan) [4]	150	1913
34)		
18 acres within E½ of NW¼ and W½ of NE¼ of Sec. 14, T.10S., R.21E., S.B.B. & M. (Milpitas) [4]	108	1918
35)		
10 acres within N½ of NE¼, SE¼ of NE¼, and NE¼ of SE¼, Sec. 30, T.9N., R.23E., S.B.B. & M. (Simons) [4]	60	1889
36)		
16 acres within E½ of NW¼ and N½ of SW¼, Sec. 12, T.9N., R.22E., S.B.B. & M. (Colo. R. Sportsmen's League) [4]	96	1921
37)		
11.5 acres within E½ of NW¼, Sec. 1, T.10S., R.21E., S.B.B. & M. (Milpitas) [4]	69	1914
38)		
11 acres within S½ of SW¼, Sec. 12, T.9N., R.22E., S.B.B. & M. (Andrade) [4]	66	1921
39)		
6 acres within Lots 2, 3, and 7 and NE¼ of SW¼, Sec. 19, T.9N., R.23E., S.B.B. & M. (Reynolds) [4]	36	1904
40)		
10 acres within N½ of NE¼, SE¼ of NE¼ and NE¼ of SE¼, Sec. 24, T.9N., R.22E., S.B.B. & M. (Cooper) [4]	60	1906
41)		
20 acres within SW¼ of SW¼ (Lot 8), Sec. 19, T.9N., R.23E., S.B.B. & M. (Chagnon) [4]	120	1925
42)		
20 acres within NE¼ of SW¼, N½ of SE¼, SE¼ of SE¼, Sec. 14, T.9S., R.21E., S.B.B. & M. (Lawrence) [4]	120	1915

2. The following miscellaneous present perfected rights in California in annual quantities of water not to exceed the listed number of acre-feet of (i) diversions from the mainstream or (ii) the quantity of mainstream water necessary to supply the consumptive use, whichever of (i) or (ii) is less, for domestic, municipal, and industrial purposes within the boundaries of the land described and with the priority dates listed:

[3] The quantity of water in each instance is measured by (i) diversions or (ii) consumptive use required for irrigation of the respective acreage and for satisfaction of related uses, whichever of (i) or (ii) is less.

[4] The names in parentheses following the description of the "Defined Area of Land" are used for identification of present perfected rights only; the name used is the first name appearing as the claimant identified with a parcel in California's 1967 list submitted to this Court.

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use (acre-feet)	Priority Date
43) City of Needles [6]	1,500	950	1855
44) Portions of: Secs. 5, 6, 7 & 8, T.7N., R.24E.; Sec. 1, T.7N., R.23E.; Secs. 4, 5, 9, 10, 15, 22, 23, 25, 26, 35, & 36, T.8N., R.23E.; Secs. 19, 29, 30, 32 & 33, T.9N., R.23E., S.B.B. & M. (Atchison, Topeka and Santa Fe Railway Co.) [6]	1,260	273	1896
45) Lots 1, 2, 3, 4, 5, & SW¼ NW¼ of Sec. 5, T.13S., R.22E., S.B.B. & M. (Conger) [7]	1.0	0.6	1921
46) Lots 1, 2, 3, 4 of Sec. 32, T.11S., R.22E., S.B.B. & M. (G. Draper) [7]	1.0	0.6	1923
47) Lots 1, 2, 3, 4, and SE¼ SW¼ of Sec. 20, T.11S., R.22E., S.B.B. & M. (McDonough) [7]	1.0	0.6	1919
48) SW¼ of Sec. 25, T.8S., R.22E., S.B.B. & M. (Faubion) [7]	1.0	0.6	1925
49) W½ NW¼ of Sec. 12, T.9N., R.22E., S.B.B. & M. (Dudley) [7]	1.0	0.6	1922
50) N½ SE¼ and Lots 1 and 2 of Sec. 13, T.8S., R.22E., S.B.B. & M. (Douglas) [7]	1.0	0.6	1916
51) N½ SW¼, NW¼ SE¼, Lots 6 and 7, Sec. 5, T.9S., R.22E., S.B.B. & M. (Beauchamp) [7]	1.0	0.6	1924
52) NE¼ SE¼, SE¼ NE¼, and Lot 1, Sec. 26, T.8S., R.22E., S.B.B. & M. (Clark) [7]	1.0	0.6	1916
53) N½ SW¼, NW¼ SE¼, SW¼ NE¼, Sec. 13, T.9S., R.21E., S.B.B. & M. (Lawrence) [7]	1.0	0.6	1915
54) N½ NE¼, E½ NW¼, Sec. 13, T.9S., R.21E., S.B.B. & M. (J. Graham) [7]	1.0	0.6	1914
55) SE¼, Sec. 1, T.9S., R.21E., S.B.B. & M. (Geiger) [7]	1.0	0.6	1910
56) Fractional W½ of SW¼ (Lot 6) Sec. 6; T.9S., R.22E., S.B.B. & M. (Schneider) [7]	1.0	0.6	1917
57) Lot 1, Sec. 15; Lots 1 & 2, Sec. 14; Lots 1 & 2, Sec. 23; all in T.13S., R.22E., S.B.B. & M. (Martinez) [7]	1.0	0.6	1895
58) NE¼, Sec. 22, T.9S., R.21E., S.B.B. & M. (Earle) [7]	1.0	0.6	1925
59) NE¼ SE¼, Sec. 22, T.9S., R.21E., S.B.B. & M. (Diehl) [7]	1.0	0.6	1928
60) N½ NW¼, N½ NE¼, Sec. 23, T.9S., R.21E., S.B.B. & M. (Reid) [7]	1.0	0.6	1912
61) W½ SW¼, Sec. 23, T.9S., R.21E., S.B.B. & M. (Graham) [7]	1.0	0.6	1916
62) S½ NW¼, NE¼ SW¼, SW¼ NE¼, Sec. 23, T.9S., R.21E., S.B.B. & M. (Cate) [7]	1.0	0.6	1919
63) SE¼ NE¼, N½ SE¼, SE¼ SE¼, Sec. 23, T.9S., R.21E., S.B.B. & M. (McGee) [7]	1.0	0.6	1924
64) SW¼ SE¼, SE¼ SW¼, Sec. 23, NE¼ NW¼, NW¼ NE¼, Sec. 26; all in T.9S., R.21E., S.B.B. & M. (Stallard) [7]	1.0	0.6	1924
65) W½ SE¼, SE¼ SE¼, Sec. 26, T.9S., R.21E., S.B.B. & M. (Randolph) [7]	1.0	0.6	1926
66) E½ NE¼, SW¼ NE¼, SE¼ NW¼, Sec. 26, T.9S., R.21E., S.B.B. & M. (Stallard) [7]	1.0	0.6	1928
67) S½ SW¼, Sec. 13, N½ NW¼, Sec. 24; all in T.9S., R.21E., S.B.B. & M. (Keefe) [7]	1.0	0.6	1926
68) SE¼ NW¼, NW¼ SE¼, Lots 2, 3 & 4, Sec. 25, T.13S., R.23E., S.B.B. & M. (C. Ferguson) [7]	1.0	0.6	1903
69) Lots 4 & 7, Sec. 6; Lots 1 & 2, Sec. 7; all in T.14S., R.24E., S.B.B. & M. (W. Ferguson) [7]	1.0	0.6	1903
70) SW¼ SE¼, Lots 2, 3, and 4, Sec. 24, T.12S., R.21E., Lot 2, Sec. 19, T.12S., R.22E., S.B.B. & M. (Vaulin) [7]	1.0	0.6	1920
71) Lots 1, 2, 3 and 4, Sec. 25, T.12S., R.21E., S.B.B. & M. (Salisbury) [7]	1.0	0.6	1920
72) Lots 2, 3, SE¼ SE¼, Sec. 15, NE¼ NE¼, Sec. 22; all in T.13S., R.22E., S.B.B. & M. (Hadlock) [7]	1.0	0.6	1924
73) SW¼ NE¼, SE¼ NW¼, and Lots 7 & 8, Sec. 6, T.9S., R.22E., S.B.B. & M. (Streeter) [7]	1.0	0.6	1903
74) Lot 4, Sec. 5; Lots 1 & 2, Sec. 7; Lots 1 & 2, Sec. 8; Lot 1, Sec. 18; all in T.12S., R.22E., S.B.B. & M. (J. Draper) [7]	1.0	0.6	1903
75) SW¼ NW¼, Sec. 5; SE¼ NE¼ and Lot 9, Sec. 6; all in T.9S., R.22E., S.B.B. & M. (Fitz) [7]	1.0	0.6	1912
76) NW¼ NE¼, Sec. 26; Lots 2 & 3, W½ SE¼, Sec. 23; all in T.8S., R.22E., S.B.B. & M. (Williams) [7]	1.0	0.6	1909
77) Lots 1, 2, 3, 4, & 5, Sec. 25, T.8S., R.22E., S.B.B. & M. (Estrada) [7]	1.0	0.6	1928
78) S½ NW¼, Lot 1, frac. NE¼ SW¼, Sec. 25, T.9S., R.21E., S.B.B. & M. (Whittle) [7]	1.0	0.6	1925
79) N½ NW¼, Sec. 25; S½ SW¼, Sec. 24; all in T.9S., R.21E., S.B.B. & M. (Corington) [7]	1.0	0.6	1928

[7] The names in parentheses following the description of the "Defined Area of Land" are the names of the homesteaders upon whose water use these present perfected rights, added since the 1967 list submited to this Court, are predicated.

Defined Area of Land	Annual Diversions (acre-feet)	Annual Consumptive Use (acre-feet)	Priority Date
80)			
S½ NW¼, N½ SW¼, Sec. 24, T.9S., R.21E., S.B.B. & M. (Tolliver) [7]	1.0	0.6	1928

III

NEVADA

A. Federal Establishments Present Perfected Rights

The federal establishments named in Art. II, subdivision (D), paragraphs (5) and (6) of the Decree entered on March 9, 1964, in this case, such rights having been decreed by Art. II:

Defined Area of Land	Annual Diversions (acre-feet)	Net Acres	Priority Date
81)			
Fort Mojave Indian Reservation	12,534 [8]	1,939 [9]	Sept. 16, 1890
82)			
Lake Mead National Recreation Area (The Overton Area of Lake Mead N.R.A. provided in Executive Order 5105)	500	300 [9]	May 3, 1929 [10]

It is ordered that Judge Elbert P. Tuttle be appointed Special Master in this case with authority to fix the time and conditions for the filing of additional pleadings and to direct subsequent proceedings, and with authority to summon witnesses, issue subpoenas, and take such evidence as may be introduced and such as he may deem necessary to call for. The Master is directed to submit such reports as he may deem appropriate.

The Master shall be allowed his actual expenses. The allowances to him, the compensation paid to his technical, stenographic, and clerical assistants, the cost of printing his report, and all other proper expenses shall be charged against and borne by the parties in such proportion as the Court may hereafter direct.

It is further ordered that if the position of Special Master in this case becomes vacant during a recess of the Court, THE CHIEF JUSTICE shall have authority to make a new designation which shall have the same effect as if originally made by the Court.

It is further ordered that the motion of Fort Mojave Indian Tribe et al. for leave to intervene, insofar as it seeks intervention to oppose entry of the supplemental decree, is denied. In all other respects, this motion and the motion of Colorado River Indian Tribes et al. for leave to intervene are referred to the Special Master.

MR. JUSTICE MARSHALL took no part in the consideration or decision of this case.

RALPH E. HUNSAKER, Phoenix, Ariz., for complainant; EVELLE J. YOUNGER, Attorney General, State of California (SANFORD N. GRUSKIN, Chief Assistant Attorney General, R.H. CONNETT and N. GREGORY TAYLOR, Assistant Attorneys General; EDWIN J. DUBIEL, DOUGLAS B. NOBLE, EMIL STIPANOVICH, JR., and ANITA E. RUUD, Deputy Attorneys General, ROBERT P. WILL, and RICHARD PAUL GERBER, with him on the brief) for defendant; LOUIS F. CLAIBORNE, Assistant to the Solicitor General (WADE H. McCREE, JR., Solicitor General, JAMES W. MOORMAN, Assistant Attorney General, and MYLES E. FLINT, Justice Department attorney, with him on the brief) for intervenors; RAYMOND C. SIMPSON, Palo Verdes Estates, Calif., as amicus curiae for Fort Mojave Indian Tribe; LAWRENCE D. ASCHENBRENNER, Washington, D.C. as amicus curiae for Cocopah Indian Tribe; and TERRY NOBLE FISKE, Denver, Colo., as amicus curiae for Colorado River Indian Tribes.

[8] The quantity of water in each instance is measured by (i) diversions or (ii) consumptive use required for irrigation of the respective acreage and for satisfaction of related uses, whichever of (i) or (ii) is less.

[9] Refers to acre-feet of annual consumptive use, not to net acres.

[10] Article II (D)(6) of said Decree specifies a priority date of March 3, 1929. Executive Order 5105 is dated May 3, 1929 (see C. F. R. 1964 Cumulative Pocket Supplement, p. 276, and the Findings of Fact and Conclusions of Law of the Special Master's Report in this case, pp. 294-295).

APPENDIX XI - "ENLARGEMENT OF RESERVATIONS" AND "OMISSION" OF IRRIGABLE ACREAGE

Chemehuevi Indian Reservation

1101 - Secretary of the Interior's Withdrawal Order, February 2, 1907

1102 - Act of July 8, 1940, 54 Stat. 733

1103 - Act of October 28, 1942, 56 Stat. 1011

1104 - Secretarial Determination, August 15, 1974

1105 - Secretarial Order, November 1, 1974

Cocopah Indian Reservation

1106 - Act of August 17, 1961, 75 Stat. 387, Public Law 87-150

Colorado River Indian Reservation

1107 - Solicitor's Opinion, January 17, 1969

1108 - Secretarial Directive, January 17, 1969

Fort Mohave Indian Reservation

1109 - Executive Order, March 30, 1870

1110 - Executive Order, September 19, 1890

1111 - Executive Order, December 1, 1910

1112 - Solicitor's Opinion, June 3, 1974

1113 - Secretary's Directive, June 3, 1974

1101

DEPARTMENT OF THE INTERIOR

WASHINGTON

APPENDIX A

February 2, 1907.

The Commissioner of
The General Land Office.

Sir:

I transmit herewith, a copy of a communication from the Acting Commissioner of Indian Affairs, dated the 31st ultimo, transmitting descriptions of certain lands in California, which he recommends be withdrawn from all form of settlement and entry, pending action by Congress authorizing the addition of the lands described to the various Mission Indian Reservations.

In view of the recommendation of the Indian Office, I have to direct that the lands referred to be withdrawn from all form of settlement or entry until further notice, also that the local land officers of the districts in which the said lands are located, be advised of such withdrawal.

In this connection you are advised that the Department on the 31st ultimo forwarded to Congress, with favorable recommendation, the draft of a bill to authorize the addition of certain lands to the Mission Indian Reservations.

Very respectfully,

(Sgd.) E. A. HITCHCOCK.
Secretary.

974 Ind. Div. 1907.
1 enclosure.

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF INDIAN AFFAIRS
Washington

January 31, 1907.

IN REPLY PLEASE REFER TO
Land
5457 - 1907.

The Honorable,

The Secretary of the Interior.

Sir:

Referring to Office letter of January 28, transmitting reports of Special Agent C. H. Kelsey on the condition of the Mission Indian Reservations in California, and the draft of a proposed bill for the betterment of their conditions, I have now the honor to transmit herewith certain descriptions of land which he recommends be withdrawn from all form of settlement and entry pending action by Congress whereby they may be added to the several reservations.

The proposed additions are as follows:

Twenty-nine Palms. - The SW1/4 of Sec. 33, T. 1 N., R. 9 N., S.B.B.

Inyaha. - The N1/2 of NW1/4 and SE1/4 of NW1/4, Sec. 33; the W1/2 of Sec. 26 and the W1/2 of NE1/4, Sec. 26, and if the same has not been already added, the S1/2 of SE1/4 and the NW1/4 of SE1/4, Sec. 26, all in T. 13 S., R. 3 E., S.B.M.

Santa Rose. - The N1/2 of Sec. 32, all of Sec. 33, and the W1/2 of Sec. 34, T. 7 S., R. 5 R., S.B.M.

Capitan Grande. - Secs. 21, 23, 25, 26, the E1/2 of Sec. 27 and the N1/2 of Sec. 34, T. 14 S., R. 2 E., S.B.M.; the N1/2 of Sec. 10 and the S1/2 of Secs. 1 and 2, T. 15 S., R. 2 E.; the W1/2 of Sec. 28, the N1/2 of the NE1/4 and the E1/2 of SE1/4, Sec. 28, the SW1/4 Sec. 33, the S1/2 of SE1/4, the NE1/4 of SE1/4, the SE1/4 of NE1/4, and the N1/2 of NE1/4, Sec. 33, all of T. 14 S., R. 3 E., the whole of Secs. 4, 7, and 8, and the SW1/4 of NW1/4, and the NW1/4 of SW1/4 of Sec. 9, all T. 15 S., R. 3 E., S.B.M.

Agua Caliente or Palm Springs. - Secs. 6, 7 if the same be exchanged with the S. P. R. R., Sec. 10, T. 4 S., R. 4 E., and Secs. 2, 10 and 11, T. 5 S., R. 4 E., S.B.M.

Martinez. - Secs. 16 and 36, T. 7 S., R. 8 E., S.B.M., if the same have not been added already.

Chimehuevi Valley. - Fractional townships 4 N., R. 25 N., R. 4 N., R. 26 E., T. 5 N., R. 25 E., T. 6 W., R. 25 R., the N1/2 of T. 5 N., R. 24 E., and Secs. 25, 26, 35 and 36, T. 6 N., R. 24 E., S.B.M.

Saboda or San Jacinto. - Fractional Sec. 5, T. 5 S., R. 1 N., and Lots 1, 2, 3, 4, and 5, and the NE1/4 of Sec. 29, and all of Sec. 31, T. 4 S., R. 1 E., S.B.M.

Campe. - The NE¼ of NW¼ of Sec. 3; the NE¼ of SW¼, the W½ of NE¼ Sec. 4, T. 18 S., R. 5 N., and the S½ of SE¼ of Sec. 33, and the S½ of SW¼ Sec. 34, T. 17 S., R. 5 E., S.B.M.

Laguna. - The S½ of SW¼ Sec. 28, and the W½ of SW¼ Sec. 33, T. 14 S., R. 5 E., S.B.M.

Onyapipe. - The S½ of Secs. 17 and 18, all of Sec. 19, excepting the E½ of NE¼ and the E½ of SE¼ already in the reservation, the E½ of NE¼ and the E½ of SE¼, Sec. 20, the W½ of NE¼ Sec. 20, all of Secs. 21, 28, and 30; the SW¼ of Sec. 29, the S½ of SE¼ Sec. 29, the N½ Sec. 32, the N½ Sec. 33, the SE¼, the E½ of SW¼, and the SW¼ of SW¼ Sec. 33, T. 15 S., R. 6 E., S.B.M.

La Posta. - The SW¼ of SW¼, the NE¼ of SW¼, the SE¼ of NW¼, the N½ of SE¼, and the NE¼, all of Sec. 31, and all of Secs. 32 and 33, T. 16 S., R. 6 E., and all of Secs. 4 and 5, and the SW¼, the SE¼, the S½ of NW¼, the S½ of NE¼, and the NW¼ of NE¼ of Sec. 6, T. 17 S., R. 6 E., S.B.M.

Manzanita. - Sec. 22, Sec. 23 (should McCain convey the SW¼ to the United States), the W½ Sec. 24, the W½ Sec. 25, and all of Secs. 27, 34 and 35, T. 16 S., R. 6 E., S.B.M.

Campo. - Secs. 1, 2, 3, 10, the N½ of Sec. 11, the W½ of SW¼, the N½ of SE¼, and the SE¼ of SE¼ Sec. 11; all of Sec. 12, and the N½ Sec. 13, the N½ Sec. 14, excepting the NW¼ of NE¼, Secs. 15, 21, the NW¼, the NE¼, the N½ of SW¼, the N½ of SE¼, and the SE¼ of SE¼, Sec. 22, the N½ Sec. 20, Sec. 27 (excepting the NW¼ of NE¼) the N½ of NE¼, the E½ of SE¼, and the W¼ Sec. 28; the E½ Sec. 29; the NE¼ and the W½ of SE¼ Sec. 32; the NW¼ and the W½ of N½ Sec. 33; the N½ and the NW¼ of SE¼ and the NE¼ of SW¼ Sec. 34; all in T. 17 S., R. 6 E., the E½ of Secs. 5, 8 and 17, and all of Secs. 3, 4, 9, 10, 15 and 16 (school section), the E½ of fractional Sec. 20 and fractional Sec. 21, all in T. 18 S., R. 6 E., S.B.M.

I have the honor to recommend that the Commissioner of the General Land Office be instructed to note the withdrawal of these lands from all forms of settlement and entry, and directed to advise the officers of the local land offices for the districts in which the lands are situated, of such withdrawal.

Very respectfully,

C. F. Farrabee,
Acting Commissioner.

6-23 glb.

[CHAPTER 552]

AN ACT

July 8, 1940
(S. 3931)
[Public, No. 730]

For the acquisition of Indian lands for the Parker Dam and Reservoir project, and for other purposes.

Parker Dam project.
Acquisition of Indian lands for.
49 Stat. 1039.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in aid of the construction of the Parker Dam project, authorized by the Act of August 30, 1935 (49 Stat. 1028), there is hereby granted to the United States, its successors and assigns, subject to the provisions of this Act, all the right, title, and interest of the Indians in and to the tribal and allotted lands of the Fort Mohave Indian Reservation in Arizona and the Chemehuevi Reservation in California as may be designated by the Secretary of the Interior.

Determination of amount to be paid to Indians.
Payment by Metropolitan Water District of Southern California.

SEC. 2. The Secretary of the Interior shall determine the amount of money to be paid to the Indians as just and equitable compensation for the rights granted under section 1 hereof. Such amount of money shall be paid to the Secretary of the Interior by the Metropolitan Water District of Southern California, a public corporation of the State of California, in accordance with the terms of the contract made and entered into on February 10, 1933, between the United States of America, acting through the Secretary of the Interior, and the Metropolitan Water District of Southern California. In the case of tribal lands, the amount due to the appropriate tribe shall be deposited by the said Secretary in the Treasury of the United States, pursuant to the provisions of the Act of May 17, 1926 (44 Stat. 560), as amended. The amounts due individual allottees, their heirs, or devisees shall be deposited by the said Secretary to the credit of the Superintendent of the Colorado River Indian Agency, or such other officer as shall be designated by the Secretary, for the credit on the books of the said agency to the accounts of the individual Indians concerned.

Deposit of amounts due tribes.

25 U.S.C. §155.

Deposit of amounts due allottees.

Use of allottee funds.

SEC. 3. Funds deposited to the credit of the allottees, their heirs, or devisees may be used, in the discretion of the Secretary of the Interior, for the acquisition of other lands and improvements now in Indian ownership, or the construction of improvements for the allottees, their heirs, or devisees, whose lands and improvements are acquired under the provisions of this Act. Lands so acquired shall be held in the same status as those from which the funds were derived.

Regulations, etc.

SEC. 4. The Secretary of the Interior is hereby authorized to perform any and all acts and to prescribe such regulations as may be deemed appropriate to carry out the provisions of this Act.

Approved, July 8, 1940.

[CHAPTER 630]

AN ACT

October 28, 1942
[S. 2369]
[Public Law 764]

For the acquisition of Indian lands required in connection with the construction, operation, and maintenance of electric transmission lines and other works, Parker Dam power project, Arizona-California.

Parker Dam power project.
Acquisition of Indian lands.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in aid of the construction of the Parker Dam power project, there is hereby granted to the United States, subject to the provisions of this Act, such right, title, and interest of the Indians as may be required in and to such tribal and allotted lands as may be designated by the Secretary of the Interior from time to time for the construction, operation, and maintenance of electric transmission lines and other works of the project or for the relocation or reconstruction of properties made necessary by the construction of the project.

Compensation.

SEC. 2. As lands or interests in lands are designated from time to time under this Act, the Secretary of the Interior shall determine the amount of money to be paid to the Indians as just and equitable compensation therefor. The amounts due the tribe and the individual allottees or their heirs or devisees shall be paid from funds now or hereafter made available for the Parker Dam power project to the superintendent of the appropriate Indian agency, or such other officer as may be designated by the Secretary of the Interior, for credit on the books of such agency to the accounts of the tribe and the individuals concerned.

Use of designated funds.

SEC. 3. Funds deposited to the credit of allottees, their heirs, or devisees, may be used, in the discretion of the Secretary of the Interior, for the acquisition of other lands and improvements, or the relocation of existing improvements or construction of new improvements on the lands so acquired for the allottees or heirs whose lands and improvements are acquired under the provisions of this Act. Lands so acquired shall be held in the same status as those from which the funds were derived, and shall be nontaxable until otherwise provided by Congress.

Authority of Secretary of Interior.

SEC. 4. The Secretary of the Interior is hereby authorized to perform any and all acts and to prescribe such regulations as he may deem appropriate to carry out the provisions of this Act.

Approved, October 28, 1942.

UNITED STATES DEPARTMENT OF THE INTERIOR

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

1104

August 15, 1974

Order

To : Assistant Secretary for Fish and Wildlife
and Parks
Assistant Secretary—Land and Water Resources
Commissioner of Indian Affairs

From : Secretary of the Interior /s/John C. Whitaker

Subject: Title of Certain lands Riparian to Lake Havasu

I have today determined to correct the designation by Secretary Ickes of November 25, 1941 that certain lands of the Chemehuevi Indian Reservation should be taken for use in the construction of Parker Dam pursuant to the Act of June 8, 1940, 54 Stat. 744. The corrected designation determines, establishes and confirms that the Chemehuevi Tribe has full equitable title to all lands within the Chemehuevi Indian Reservation riparian to Lake Havasu designated by Secretary of the Interior Ickes on November 25, 1941, between north and south boundaries as follows:

North Boundary

From a point in Section 18 T5N R25E, located as follows: Beginning at the SE Corner of said Section 18 due west 711 ft; thence N00°21'E a distance of 1304 ft; thence N51°20'W a distance of 1967 ft; thence N01°16'E a distance of 1130 ft. from said point the North Boundary is established on a line of S74°08'E to the minimum pool elevation of the west bank of Lake Havasu.

South Boundary

From a point on the south line of Sec. 33, T4N, R26E which is 3156' N89°51'E a distance of 350' more or less to the minimum pool elevation of the west bank of Lake Havasu.

This corrected designation is subject to the reservation of certain rights in the United States as follows:

(a) The right to deposit spoil and snags from Lake Havasu on said lands at locations mutually agreeable to the United States and the Tribe, provided that the Tribe's consent should not be unreasonably withheld;

(b) the right to flood and seep said lands in connection with its operations under the Act of December 21, 1928 (49 Stat. 1057), the Act of August 30, 1935 (49 Stat. 1028), and the said Act of June 28, 1946, (60 Stat. 338), as amended;

(c) the right of free ingress to, passage over and egress from said lands for the purpose of exercising the above rights and for all lawful purposes in connection with (I) protection, maintenance and administration of the Havasu National Wildlife Refuge, (II) United States responsibilities relating to administration of the Chemehuevi Indian Reservation and (III) United States responsibilities relating to Lake Havasu and the Colorado River.

Additionally, the corrected designation is subject to the valid existing rights of private persons. There are two concession contracts and approximately seventy special use permits covering some of the lands in question. These expire at various dates between the present time and 1984. I direct that they be extended, to the extent necessary, until the following dates:

(1) *Residential permits*

(a) *Residents who use the permitted lands as a full time residence for a substantial portion of each year.* I am informed that at least ten permittees are substantially full-time residents.* The latest of these permits expires on July 31, 1979. I direct that each of these permits should be extended until August 15, 1980. In addition, I am advised that several other permittees claim that they are substantially permanent residents of the area. If any individual permittee wishes formally to claim such status, by a letter directed to me, within sixty days of this date, I direct the Office of Hearings and Appeals of this Department promptly to hold an informal hearing at Havasu Landing to determine the validity of all such claims.

*These are as follows:

Lot No.	Permittee	Permit Number
3	L.G. & Rose M. Pasley	23503
9	J.D. & Miriam Squires	23502
12	Aaron J. & Iona R. Laur	19774
18	John W. Goodgame	HAV-58
19	Dorothy Holley	12094
28	Dick & Eunice Parton	19745
31	Joseph, Jr. & Rosemary Benjamin	14800
40	Leo Rossler	19742
52	Leonard M. Vogt	HAV-52
56	Edward F. Patterson	HAV-73

The tribe may participate in that hearing. I reserve the right to, and will, extend any such permit until August 15, 1980 if the permittee is determined by the Office of Hearings and Appeals to be a substantially full-time resident.

(b) *Other residential permittees (including those who use the permitted lands for weekend and vacation homes).* All such individual residential permits are to be extended until August 15, 1977.

(2) *Non-residential permittees.*** These permits shall be extended until August 15, 1976.

(3) The concession contracts expire in 1979 and 1984. They will not be extended, but until their expiration the Tribe will not interfere with the rights of the contractors or the general public to have access to the lands under contract as such reasonable locations as the Secretary shall determine.

Any of these permittees may obtain further extensions at the option and with the consent of the Tribe. All permit extensions here directed shall be subject to revision of the annual use fee, to be the fair market value of the land without improvements, at the date the present permit expires. I direct that all necessary appraisals be made at that time, and that all use fees shall be apportioned between the tribe and the United States from and after this date.

This corrected designation shall also be subject to all rights of the Metropolitan Water District of Southern California under that District's contract with the United States, captioned "Cooperative Contract for Construction and Operation of Parker Dam," dated February 10, 1933 (Designated 11r-712, as supplemented and amended by contracts between the same parties dated September 29, 1936, April 7, 1939 and December 16, 1952).

••These are:

Lot No.	Permittee	Permit Number
34	Rialto Fish & Game Club	14821
58&59	California Division of Fish & Game	14834
66	The Plunkers Club	19747
100	Needles Rod, Boat & Gun Club	12081

Finally, the corrected designation provides that the tribe shall not construct any permanent improvements within 300 feet of the minimum pool level of Lake Havasu.

I direct that all necessary steps shall be taken to implement this decision, including modification of the boundaries of Havasu National Wildlife Refuge as established by Executive Order of President Roosevelt on January 22, 1941.

1105

SECRETARIAL ORDER

Pursuant to the determination made by the Acting Secretary on August 15, 1974, this order corrects the designation by Secretary Ickes of November 25, 1941, that certain lands of the Chemehuevi Indian Reservation should be taken for use in the construction of Parker Dam pursuant to the Act of July 8, 1940, 54 Stat. 744. The Chemehuevi Tribe has full equitable title to all those lands within the Chemehuevi Indian Reservation designated to be taken by Secretary Ickes in 1941 between the operating pool level of Lake Havasu on the east (elevation 450 feet m.s.l.) and the following north and south boundaries:

North Boundary

From a point in Section 18 T5N R25E, located as follows: Beginning at the SE Corner of said section-18 S89°22'W 711 ft; thence N00°21'E a distance of 1304 ft; thence N51°20'W a distance of 1697 ft; thence N01°16'E a distance of 1130 ft. From said point the North Boundary is established on a line S74°08'E to the operating pool level of the west bank of Lake Havasu (elevation 450 feet m.s.l.).

South Boundary

From point on the south line of Sec. 33, T4N, R26E which is 3156' N89°51'E a distance of 350' more or less to the operating pool level of the west bank of Lake Havasu (elevation 450 feet m.s.l.).

This corrected designation is subject to the reservation of the following rights in the United States:

(a) The United States, acting under the Act of June 28, 1946 (60 Stat. 338), retains the rights to deposit spoil and snags from Lake Havasu on said lands at locations mutually agreeable to the United States and the Tribe. Such agreement will not be unreasonably withheld by the Tribe.

(b) The United States retains the right to flood and seep said lands in connection with its operations under the Act of December 21, 1928 (45 Stat. 1057), the Act of August 30, 1935 (49 Stat. 1028), and the said Act of June 28, 1946, (60 Stat. 338), as amended, and the Tribe will not construct or install or permit the construction or installation of any buildings for human habitation on any lands included in this corrected designation that are located within three hundred (300) feet landward of Lake Havasu as measured along a line horizontal to a perpendicular rising from the elevation level of four hundred fifty (450) foot m.s.l.; provided, however, that nothing herein shall be construed as imposing any restriction not now in existence whatsoever with respect to any land not included in this corrected designation which is contiguous to the land so included and which is within three hundred (300) feet landward of Lake Havasu as so measured.

The Tribe shall have the exclusive right to use and occupancy of any lands below the operating pool level of the west bank of Lake Havasu (elevation 450 feet m.s.l.) located between the north and south boundaries of this corrected designation for hunting, fishing, recreational and other similar purposes, and may, with the prior approval of the Secretary of the Interior, construct or install or permit the construction or installation of improvements on such lands.

The United States agrees that, should the operating pool level of Lake Havasu be modified to be below the elevation 450 feet m.s.l., the Secretary of the Interior will correct this designation so as to confirm, determine and establish the tribe's full equitable title to all lands between the new operating pool level and the elevation 450 feet m.s.l.

(c) The United States, its officers, agents and employees shall, at all proper times and places, freely have ingress to, passage over and egress from said lands for the purpose of exercising the rights specified in this order and for all lawful purposes in connection with (i) protection, maintenance and administration of the Havasu National Wildlife Refuge, (ii) United States responsibilities relating to administration of the Chemehuevi Indian Reservation and (iii) United States responsibilities relating to Lake Havasu and the Colorado River. The right of ingress, passage, and egress provided for in this subparagraph (c) relate only to said lands and are not intended, nor do they create, any rights with respect to any other lands.

(d) The right of the United States to make irrevocable extensions of the permit of any person now entitled to use the aforesaid land until August 15, 1980, if such person shall be determined by the Department of the Interior Office of Hearings and Appeals to be a full-time resident of the permitted lands for a substantial portion of each year.

(e) The corrected designation is also subject to all valid existing rights, including specifically the following rights of private persons:

(i) The rights of all persons holding concession contracts and special use permits referred to in Attachment A hereto, during the time that such rights shall exist under the terms of the concession contracts and special use permits, including the right of contractors, concessioners and permittees under the contracts and permits referred to in Attachment A and their agents, employees and invitees, including the public in the case of concession agreements, to have access to the lands which are the subject of said contracts and permits at such reasonable locations as the Secretary of the Interior may determine.

(ii) The rights of the Metropolitan Water District of Southern California under that District's contract with the United States, captioned "Cooperative Contract for Construction and Operation of Parker Dam," dated February 10, 1933 (Designated 11r-712), as supplemented and amended by contracts between the same parties dated September 29, 1936, April 7, 1939 and December 16, 1952.

Public Law 87-150 1106

AN ACT

August 17, 1961
[S. 54]

To grant eighty-one acres of public domain to the Cocopah Indians in Arizona.

Cocopah Indians.
Land.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That all of the right, title, and interest in the following described public domain are hereby declared to be held by the United States in trust for the Cocopah Indians in Arizona, subject to any valid existing rights heretofore initiated under the public land laws: lots 14 and 15, section 30, township 9 south, range 24 west; and lots 3, 4, and 5, section 25, township 9 south, range 25 west, Gila and Salt River meridian, Arizona, containing 81.64 acres.

Approved August 17, 1961.

1107

Memorandum

To: Secretary of the Interior

From: Solicitor

Subject: Western boundary of the Colorado River Indian Reservation from the top of Riverside Mountain, California, through section 12,T. 5 S., R. 23 E., S.B.M., California

This is in response to your request that we review and define the location of the western boundary of the Colorado River Indian Reservation from the top of Riverside Mountain, California, to its intersection with the line between the second and third tiers of sections in T. 5 S., R. 23 E., S.B.M., California (hereinafter referred to as from the top of Riverside Mountain through section 12, T. 5 S., R. 23 E., S.B.M., California).

The Colorado River Indian Reservation was established by the Act of March 3, 1865, 13 Stat. 541, 559. Subsequently, its boundaries were modified by the Executive Orders of November 22, 1873, November 16, 1874, May 15, 1876, and November 22, 1915. The unallotted lands of the reservation are held by the United States in trust for the Colorado River Indian Tribes. Act of April 30, 1964, 78 Stat. 188.

The Colorado River Indian Tribes have requested that the western boundary of the reservation be finally determined. Until such determination is made the leasing provisions of the Act of April 30, 1964, *supra*, do not extend to lands south of section 25, T. 2 S., R. 23 E., S.B.M., California.

The Executive Order which describes the portion of the boundary considered in this memorandum is as follows:

EXECUTIVE MANSION, May 15, 1876.

Whereas an Executive Order was issued November 16, 1874, defining the limits of the Colorado River Indian Reservation, which purported to cover, but did not, all the lands theretofore set apart by act of Congress approved March 3, 1865, and Executive Order dated November 22, 1873; and whereas the order of November 16, 1874, did not revoke the order of November 22, 1873, it is hereby ordered that all lands withdrawn from sale by either of these orders are still set apart for Indian purposes; and the following are hereby declared to be the boundaries of the Colorado River Indian Reservation in Arizona and California, viz:

Beginning at a point where La Paz Arroyo enters the Colorado River, 4 miles above Ehrenberg; thence easterly with said arroyo to a point south of the crest of La Paz Mountain; thence with said mountain crest in a northerly direction to the top of Black Mountain; thence in a northwesterly direction over the Colorado River to the top of Monument Peak, in the State of California; thence southwesterly in a straight line to the top of Riverside Mountain, California; thence in a direct line toward the place of beginning to the west bank of the Colorado River; thence down said west bank to a point opposite the place of beginning; thence to the place of beginning.

This opinion deals only with that portion of the above-described boundary from the top of Riverside Mountain through section 12, T. 5 S., R. 23 E., S.B.M., California.

As established by the Act of March 3, 1865, *supra*, and enlarged by the Executive Order of November 22, 1873, the Colorado River Indian Reservation was located in the Territory of Arizona and bounded on the west by the Colorado River. Lands in California were first added to the reservation by the Executive Order of November 16, 1874. The record discloses that this latter Executive Order enlarging the reservation was designed to make possible control of access to the reservation from the west and to avoid loss (transfer of land) caused by changes in the channel of the Colorado River. That segment of the west boundary of the reservation germane to this memorandum, i.e., from the top of Riverside Mountain to the west bank of the Colorado River, was described in the Executive Order of November 16, 1874, as a line "• • • [from the top of Riverside Mountain] in a Southeasterly direction to the point of beginning • • • ."

When this segment of the boundary was surveyed in 1875 by Chandler Robbins, it was ascertained that this line severed a large tract of valuable land on the east side of the river which had been reserved for Indian use by the Act of March 3, 1865, *supra*, and the Executive Order of November 22, 1873. Because of this fact, the Indian Agent in charge of the reservation, by letter of January 31, 1876, requested the Commissioner of Indian Affairs to obtain an Executive Order changing the boundary line of the reservation between Riverside Mountain and the place of beginning, making the Colorado River the boundary line. Thereafter, by letter of May 10, 1876, from the Acting Commissioner to the Secretary of the Interior, it was recommended that the President be requested to issue an order changing this boundary line so that when it reached the west bank of the Colorado River it would follow said west bank down the river to a point opposite the point of beginning, thence to the place of beginning. Following a concurrence in the recommendation of the Commissioner of Indian Affairs by the Acting Secretary, the President issued the Executive Order of May 15, 1876. For many years the proper location of the west boundary of the reservation, as described in the Executive Order of May 15, 1876, has been in dispute.

During the trial of *Arizona* v. *California, et al.*, the United States claimed water rights for an extensive area of irrigable lands along the west side of the river. California resisted the claim of the United States for any lands south of section 25, T. 2 S., R. 23 E., on the grounds that there were no such lands within the boundary of the reservation. California's contention was based upon the fact that the west bank of the river, which was the call of the west boundary of the reservation in the Executive Order of May 15, 1876, established a boundary that would change with movements of the river. The United States contended, among other things, that this Executive Order established a permanent and unchanging boundary along the west bank of the river as it existed in 1876.

The Special Master ordered that the proper position of the boundary be litigated and, following trial, the Special Master made Findings of Act and Conclusions of Law which, in effect, held that the Executive Order of May 15, 1876, established a boundary which changes as the course of the Colorado River changes, except when such changes are due to an avulsion. He further held that two avulsive changes had severed lands from the reservation and placed these lands on the west side of the river. The effect of the Master's holding was to disallow any claim of the United States for water for lands south of section 25, T. 2 S., R. 23 E., which were located on the west side of the Colorado River except in the two areas the Master found to have been severed from the reservation and placed on the west side of the river by manmade avulsive changes in the river's course.

Before the Supreme Court, California excepted to the Findings of Fact and Conclusions of Law of the Special Master. In ruling thereon, the Supreme Court disagreed with the Special Master's decision to determine the disputed boundary of the Colorado River Indian Reservation. *Arizona* v. *California, et al.*,

373 U.S. 546, 601 (1963). The effect of the Supreme Court's decision was to leave the boundary question open for future determination.

Location of the Boundary Between Riverside Mountain and the West Bank of the Colorado River

The proper position of the first segment of the boundary from the top of Riverside Mountain to the west bank of the river presents little difficulty. The first question that arises is which of two peaks on Riverside Mountain is the top. Absent specific definition in the Executive Orders of November 16, 1874, and May 15, 1876, it is believed that the term "top of Riverside Mountain" should be given its commonly accepted meaning and, therefore, means the highest point of that mountain.

The "top of Riverside Mountain" was supposedly monumented during a survey in 1912 by R. A. Farmer; however, there is evidence that this corner was not placed on the highest point of the mountain and, therefore, does not represent the true corner of the reservation boundary. In these circumstances, the language of the Executive Orders of November 16, 1874, and May 15, 1876, must control and the erroneous Farmer survey should be suspended in the reach from Riverside Mountain to the Colorado River for reasons hereinafter stated.

It is concluded that the reservation boundary in this reach should follow a line from the highest point on Riverside Mountain on a direct bearing toward the place of beginning as described in the Executive Order of May 15, 1876, until it strikes the proper location of the west bank of the river as it existed in 1876. This line should terminate at the point it intersects the west bank. The Executive Order clearly stated the line should go to the west bank, not half-way down the bank, to the water's edge, or any other place. The bank of a river is the water-washed and relatively permanent elevation or acclivity at the outer line of the riverbed which separates the bed from the adjacent upland, whether hill or valley, and serves to confine the waters when they reach and wash the bank without overflowing it. *Oklahoma* v. *Texas*, 260 U.S. 606 (1923). It is, therefore, concluded that the call to the west bank must be taken to mean the line of ordinary high water as it existed in 1876.

In determining the location of a boundary, when the United States has not conveyed its title to the abutting lands, it may survey and resurvey what it owns and establish and reestablish boundaries. *United States* v. *State Investment Co.*, 264 U.S. 206 (1924). The record discloses that all the lands outside the reservation boundary in this reach are owned by the United States and are under the jurisdiction of the Department of the Interior. The lands inside the boundary are owned by the United States in trust for the Colorado River Indian Tribes. No private ownerships are involved. In 1879, W. F. Benson established a meander corner common to sections 25 and 36, T. 2 S., R. 23 E., S.B.M., at a point on the west bank of the Colorado River which also fell on the line between the highest point on Riverside Mountain and the place of beginning. In these circumstances, as a matter of administrative convenience, it may be determined that the reservation boundary can and should be reestablished as a line between the highest point of Riverside Mountain and the meander corner common to the aforesaid sections 25 and 36. This line is sustained by adequate evidence of the proper location of the boundary as described in the Executive Order of May 15, 1876.

Location of the Boundary from Section 25, T. 2 S., R. 23 E., through Section 12, T. 5 S., R. 23 E., S.B.M.

From the point where the line from Riverside Mountain intersects the bank of the river, as described above, the second segment of the boundary should follow downstream along the bank of the river at the line of ordinary high water as it existed at the time of the issuance of the Executive Order of May 15, 1876, to the south boundary of section 12, T. 5 S., R. 23 E., S.B.M., subject to the application of the doctrine of erosion and accretion and avulsion to any intervening changes. *Oklahoma* v. *Texas, supra.*

With regard to such intervening changes, when the banks of a river change gradually and imperceptibly, the process is called erosion and accretion and a riparian owner's boundary will remain the stream. In cases where a river suddenly abandons its old bed and seeks a new course, the change is termed an avulsion and a riparian owner's boundary will become fixed and permanent along the line of the former channel. *Nebraska* v. *Iowa*, 143 U.S. 359 (1892).

The Executive Order of May 15, 1876, which included lands located east of the west bank of the river, would operate as to all those lands not previously disposed of by the United States, as unquestionably the President had the power to reserve the lands by Executive Order. *Sioux Tribe of Indians* v. *United States*, 316 U.S. 317 (1942); *United States* v. *Midwest Oil Co.*, 236 U.S. 459 (1915). A portion of the west half of the riverbed, however, was owned at that time by the State of California because the Colorado River has been held to be a navigable stream in the reach here under consideration. *Arizona* v. *California. et al.*, 283 U.S. 423 (1931). The soil beneath navigable waters was not granted by the original states under the Constitution to the United States but was reserved to the States. *Pollard* v. *Hagen*, 44 U.S. (3 How.) 212 (1845). Upon the admission of a new State into the Union on an equal footing it acquires all the rights of the original States which, it has been held, includes title to the lands underlying navigable waters. *Mumford* v. *Wardwell*, 73 U.S. (6 Wall.) 423 (1867). The extent of the ownership acquired by the States upon admission is the soil below ordinary high-water mark. *Mobile Transp. Co.* v. *City of Mobile*, 187 U.S. 479 (1903). Thereafter, where a navigable stream is a boundary a riparian owner's title will extend to low or high-water mark or to the center of the stream according to the law of the State in which it is situated. *Packer* v. *Bird*, 137 U.S. 661 (1891). The United States like any other riparian owner takes such title to submerged lands as may be conferred by State action. *Donnelly* v. *United States*, 228 U.S. 243 (1913).

In 1873, California enacted a law, now codified as Civil Code § 830, which had the effect of granting to riparian owners on nontidal navigable waters ownership of the soil to low-water mark. It therefore follows that in those areas where the United States owned the uplands, it gained title under State law to the low-water mark. 43 Cal. Ops. Atty. Gen. 291 (1964); *Crews* v. *Johnson*, 21 Cal. Rptr. 37 (1962). It is concluded, therefore, that at the time of issuance of the Executive Order of May 15, 1876, the United States owned the area between ordinary high-water mark and low-water mark except in those areas where it may have previously disposed of lands abutting the ordinary high-water mark. The record discloses, however, that in 1876 the United States owned all the lands abutting the west bank of the Colorado River from the above-mentioned section 25, T. 2 S., R. 23 E., south through section 12, T. 5 S., R. 23 E.

In issuing the Executive Order of May 15, 1876, the United States effectively severed that portion of the lands between the high and low-water marks by including them in the reservation, thus, effectively segregating these lands from public lands lying to the west thereof. It must be concluded that the Executive Order was effective to reserve any lands within the river then owned by the United States as such order clearly intended that the river be included in the reservation.

Thereafter, accretions forming against this shoreline to the east thereof would be lands held in trust for the Colorado River Indian Tribes in those areas where the river has moved to the east by the normal process of erosion and accretion. Similarly, in those areas where the river has moved to the west by the normal process of erosion and accretion, any accretions forming on the east side of the river are owned by the United States in trust for the Colorado River Indian Tribes.

In possible conflict with the reservation boundary, as hereinabove set out, are three tracts of school lands, these being sections 36 in Tps. 2, 3, and 4 S., R. 23 E. While the Act of Congress which granted California its school lands was passed in 1853, 10 Stat. 244, 246, title to such lands does not pass until they are surveyed. *United States* v. *Morrison*, 240 U.S. 192 (1916). Moreover, title to the school lands thus granted was expressly subject to reservations created prior to survey. 10 Stat. 244, 246. These three

sections 36 were surveyed in 1879. All three were fractional sections abutting the meander line run as part of the survey.

It is the general rule that a meander line is not a line of boundary but one used to delineate the sinuosity of the bank or shore as a means of ascertaining the quantity of land in a fractional lot, the boundary line being the water itself. *St. Paul and Pacific R. Co.* v. *Schurmeier*, 74 U.S. (7 Wall.) 272 (1869). Thus, the Department has held on numerous occasions that grants by the United States of lands shown on plats of survey as adjoining navigable waters are not limited to the meander line but extend to the water line. *Harvey M. La Follette*, 26 L.D. 453 (1898). *John J. Serry*, 27 L.D. 330 (1898). *Gleason* v. *Pent*, 14 L.D. 375 (1892). *Louis W. Pierce*, 18 L.D. 328 (1894). While this rule has been applied in cases involving the issuance of a patent, the certification of lands (such as school lands) is equivalent to patent and divests the Department of all jurisdiction over the lands or title thereto. *Frasher* v. *O'Conner*, 115 U.S. 102 (1885). *Smith* v. *Portage Lake and Superior Ship Canal Co.*, 11 L.D. 475 (1890). *State of California* v. *Boddy*, 9 L.D. 636 (1889).

Against this background, it can be expected that the State or its successors in interest might claim title to accretions to these three school sections. However, as above noted, title to these lands was expressly subject to reservations created prior to the survey thereof. Inasmuch as the Executive Order of May 15, 1876, effectively segregated the shoreline from these fractional sections 36 by including it in the reservation, it is concluded that accretions to this shoreline are lands held in trust for the Colorado River Indian Tribes and that they did not attach to the three fractional sections 36 as surveyed in 1879. For these reasons, correction surveys approved in 1964 which apportioned accretion lands to sections 36, Tps. 3 and 4 S., R. 23 E., should be suspended and the accretion surveys of these townships approved in 1962 should be reinstated in their entirety.

There are also three parcels of School Indemnity Lands in sections 1 and 12, T. 5 S., R. 23 E., selection of which was approved in 1926. All three parcels abutted the meander line as surveyed by O. P. Calloway in 1874. Congress had previously authorized Lieu Selections in California. 14 Stat. 218, 220. However, such Lieu Selections are limited to other lands of equal acreage. 26 Stat. 796. It may also be anticipated that the State or its successors in interest would claim accretions to these Indemnity parcels. The record discloses that, at the time California made its selection of these fractional lots, substantial accretions had previously formed between the meander line abutting these parcels and the course of the river. Since California was in any event limited to lands of equal acreage in making its Lieu Selections, it cannot be said that approval of these School Indemnity Lands carried accretions which had previously formed. To hold otherwise would mean that California acquired lands in excess of that which was permitted by law. This then, is an additional reason why the accretions would not have passed with title to the fractional lots. Of course, the rationale with regard to accretions to the school sections hereinabove discussed is equally applicable to the School Indemnity Lands in that the inclusion of the shoreline in the reservation prior to disposal of the fractional lots effectively segregated such shoreline from the abutting lands which the State eventually selected.

As mentioned above, the proper location of the boundary in the reach from section 25, T. 2 S., R. 23 E., through section 12, T. 5 S., R. 23 E., is the line of ordinary high water along the west bank of the river at the time of issuance of the Executive Order of May 15, 1876, subject to application of the doctrine of erosion and accretion and avulsion. Absolute certainty as to the location of the bank in 1876 is probably not possible to achieve. However, in fixing the boundary, all that is required is such certainty as is reasonable as a practical matter, having regard to the circumstances. *Arkansas* v. *Tennessee*, 269 U.S. 152 (1925). The record discloses that the reach of the bank of the river from section 25, T. 2 S., R. 23 E., through T. 4 S., R. 23 E., was meandered in 1879 and that portion of the right bank in sections 1 and 12, T. 5 S., R. 23 E., was meandered in 1874. These meander lines were reestablished in a dependent resurvey made by the Bureau of Land Management in 1958.

As noted above, in 1876 the United States owned all the lands abutting the river on the west from the above-mentioned section 25, T. 2 S., R. 23 E., south through section 12, T. 5 S., R. 23 E. Also, the record indicates the present course of the river in this reach is now along or east of its position as surveyed in 1874 and 1879, except in two insignificant respects. The record also discloses that the lands presently lying between the meander lines of 1874 and 1879 and the right bank of the river were formed by accretion. Since the bulk of the lands abutting these meander lines on the west are presently owned by the United Sttes and those lands in non-federal ownership located to the west of the meander lines are not entitled to accretions as against the United States in any event, these meander lines may be adopted as the boundary of the reservation as a matter of administrative convenience. Only lands of the United States under the jurisdiction of the Department of the Interior are involved. Considering the nature of surveys in isolated areas and the limits of accuracy which could be achieved with equipment available nearly 100 years ago, it is concluded that these lines are adequate evidence of the proper location of the reservation boundary as they are reasonable as a practical matter, having regard to the circumstances. *Arkansas* v. *Tennessee, supra.*

In summary, it is concluded that in those areas where the United States has not conveyed its title to the lands abutting the reservation, it may survey and resurvey what it owns and establish and reestablish boundaries. *United States* v. *State Investment Co., supra.* The United States may make or correct its surveys and such are not assailable in the courts, except in a direct proceeding. *Cragin* v. *Powell*, 128 U.S. 691 (1888). Therefore, in the above-mentioned areas, it is concluded the determination of the reservation boundary as herein made is not subject to collateral attack. As to those areas where the lands abutting the reservation boundary are in non-federal ownership, it may be expected that litigation will be necessary to extinguish claims of others which are adverse to those of the Colorado River Indian Tribes.

cc:
Commissioner of Indian Affairs(2)
Regional Solicitor, Los Angeles
Director, Bureau of Land Management (2) (detached)

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON

1108

JANUARY 17, 1969

Memorandum

To: Director, Bureau of Land Management
Through: Assistant Secretary, Public Land Management

From: Secretary of the Interior

Subject: Western boundary of the Colorado River Indian Reservation from the top of Riverside Mountain, California, through section 12, T. 5 S., R. 23 E., S.B.M., California

I have this date received a memorandum from the Solicitor regarding the proper location of the boundary of the Colorado River Indian Reservation in the subject reach. A copy of his memorandum is attached. Acting upon the conclusions expressed in the memorandum, I have determined that certain surveys of record in your Bureau should be suspended and other surveys reinstated so as to correctly show the interest of the Colorado River Indian Tribes in certain lands.

The presently monumented boundary of the reservation in the reach between Riverside Mountain and the Colorado River is shown on the plat of survey for T. 2 S., R. 23 E., S.B.M., approved November 20, 1913. I have concluded that this survey did not correctly locate the boundary line in this reach because it did not conform to the call of the Executive Order of May 15, 1876, that the boundary should be a direct line from the top of Riverside Mountain, California, toward the place of beginning to the west bank of the Colorado River. I have determined that the above-mentioned plat of survey should be suspended. The proper position of the reservation boundary should be a line from the highest point on Riverside Mountain to the meander corner common to fractional sections 25 and 36, T. 2 S., R. 23 E., S.B.M., as shown on the plat of survey of this township approved May 22, 1879, and reestablished by the dependent resurvey of the same township reflected on the plat of survey accepted July 22, 1958.

I have also determined that the proper location of the reservation boundary from section 25, T. 2 S., R. 23 E., S.B.M., through section 12, T. 5 S., R. 23 E., S.B.M., is along the meander lines shown on the plats of survey in Tps. 2, 3 and 4 S., R. 23 E., S.B.M., approved May 22, 1879, and T. 5 S., R. 23 E., S.B.M., approved December 28, 1874, all as reestablished by the dependent resurvey of these townships reflected on the plats of survey accepted July 22, 1958.

In 1961, accretion surveys of lands now lying between the aforementioned meander lines of 1874 and 1879 and the west bank of the Colorado River were undertaken in Tps. 3 and 4 S., R. 23 E., S.B.M., and T. 5 S., Rs. 23 and 24 E., S.B.M. Plats thereof were accepted on May 21, 1962. By your letter of January 27, 1964, to the State Director at Sacramento, California, you ordered that the plats of survey in Tps. 3 and 4 S., R. 23 E., S.B.M., be suspended as to the sections 36 in those townships. Thereafter, correction surveys of those sections 36 were undertaken which apportioned to them certain accretion lands. Plats of these correction surveys were accepted on October 28, 1964.

In light of the conclusion that the reservation boundary in the subject reach is along the meander lines established in 1874 and 1879, accretions to this boundary are lands of the United States held in trust for the Colorado River Indian Tribes. Thus the correction surveys, accepted October 28, 1964, apportioning

accretion lands to the sections 36 are incorrect and should be suspended. Also the 1962 accretion surveys in Tps. 3 and 4 S., R. 23 E., S.B.M., should be reinstated in their entirety.

Please take such action as may be appropriate to reflect the conclusions herein stated, including suspension and reinstatement of plats. Also please note the official records accordingly so that henceforth such records will indicate the proper location of the boundary of the Colorado River Indian Reservation in the subject area.

(Sgd) Stewart L. Udall

Attachment

1109

Mar. 30 1870 — Camp Mohave Military Reservation, Mohave County, Arizona Territory, lying on the Colorado River, and containing 5,582 acres in the post reserve, and 9.114.81 acres* in the hay and wood reserves, established.

*Given as 904.18 acres in 1880 GLO 46; 1884 GLO 36 and 1885 GLO 148.

(1916 MR 484; 1880 GLO 46; 1884 GLO 36; 1885 GLO 148; 1886 GLO 243; 1890 GLO 167; 1891 GLO 139; 1892 GLO 229; 1893 GLO 148; 1894 GLO 247)

1110

Sept. 19 1890 — [Acting War Secretary's recommendation of Sept. 18, 1890 that the Fort Mohave Military Reservation, Arizona Territory, be transferred to the Interior Department for Indian school purposes, under the act of July 31, 1882 (22 Stat. L. 181)] approved.

I IR 13

EXECUTIVE ORDER.

It is hereby ordered that the following described lands in Arizona, viz, Sections 4, 6, 8, 16, fractional 20, W/2 of 22, SW/4 of SW/4 of 26 and fractional Sections 28 and 34, T. 16 N., R. 21, fractional Section 12, T. 16 N., R. 22, Sections 6, 8, W/2 of 16, 18, 20, 28, 30, 32 and W/2 of 34, T. 17 N., R. 21, Sections 2, fractional 4, fractional 10, 12, 14, fractional 22, fractional 24 and fractional 36, T. 17 N., R. 22, W/2 of Section 18 and Section 30, T. 18 N., R. 21, Sections 2, 12, 14, 24, 26, fractional 28, fractional 34, 36, and all of Sections 10 and 22, not included within the present boundaries of the Fort Mojave Indian Reservation, T. 18 N., R. 22, and all of the S/2 of Section 34, not included within the present boundaries of the Fort Mojave Indian Reservation, T. 19 N., R. 22, all west of the Gila and Salt River Meridian, be, and the same are hereby, withdrawn from settlement and entry and set apart as an addition to the present Fort Mojave Indian Reservation in Arizona, for the use and occupation of the Fort Mojave and such other Indians as the Secretary of the Interior may see fit to settle thereon: Provided, That nothing herein shall affect any existing valid rights of any person to the lands described.

Wm H TAFT

The White House

December 1, 1910.

[No. 1267.]

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
WASHINGTON, D.C. 20240

1112

Memorandum June 3, 1974

To: Secretary of the Interior

From: Solicitor

Subject: Location of the western boundary of the Hay and Wood Reserve portion of the Fort Mojave Indian Reservation.

On March 8, 1974, I met with a delegation from the Fort Mojave Tribe who brought to my attention a long standing dispute over the exact location of the western boundary of that portion of their reservation which had originally been the hay and wood reserve for the military post at Camp Mojave. The details of the dispute are set out fully in the attached memorandum to me from the Associate Solicitor for Indian Affairs.

Attorneys in the other divisions of my office have reviewed this dispute and the memorandum from the Associate Solicitor. I have also personally reviewed the matter and discussed it with all the attorneys involved. I am convinced that this Department as a matter of law should acknowledge and declare that the correct western boundary of the Hay and Wood Reserve portion of the Fort Mohave Reservation is most accurately reflected by the courses, distances and acreage descriptions contained in the plats and notes of survey which accompanied the Executive Order of March 30, 1870.

In order to finally resolve this dispute, it will be necessary to declare null and void a previous 1928 resurvey of this boundary by Sidney Blout of the General Land Office. This 1928 resurvey was approved by the General Land Office in 1931. In 1957, the Secretary approved a tribal constitution which stated that the Hay and Wood Reserve contained 9114.81 acres, which in turn conforms to the courses and distances and acreage description in the 1870 Executive Order.

It is likely that the Director, Bureau of Land Management, may also have to take some other actions to remove any cloud on the right of the Fort Mojave Tribe to use and occupy the area included within the area described by the courses and distances referred to above. In the event you concur, a memorandum to the Director, Bureau of Land Management which would accomplish those results is attached for your signature.

/S/KENT FRIZZELL

Solicitor

BIA, Area Director, Phoenix
Regional Solicitor, Sacramento
Field Solicitor, Phoenix

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

1113

Memorandum June 3, 1974

To: Director, Bureau of Land Management
Through: Assistant Secretary, Land and Water Resources

From: Secretary of the Interior

Subject: Western Boundary of the Hay and Wood Reserve of the Fort Mojave Indian Reservation Arizona, California and Nevada

I have this date received a memorandum from the Solicitor regarding the proper location of the western boundary of the Hay and Wood Reserve of the Fort Mojave Indian Reservation. A copy of his memorandum is attached.

Acting upon the conclusions expressed in the Solicitor's memorandum, I have determined that the 1928 resurvey conducted by Sidney Blout under direction of the General Land Office, and the plat representing that resurvey of the above-mentioned western boundary of the Hay and Wood Reserve, approved November 15, 1930, and accepted on January 23, 1931, should be declared null and void and to have no further force or effect.

The western boundary of the "Camp Mojave Reservation for Hay and Wood" is most accurately determined and established in accordance with the intent of the original survey by using the courses, distances and acreage as described in the plats and notes of survey accompanying the Executive Order of March 30, 1870. I reject as erroneous those portions of that description which make reference to posts "marked U.S. in a mound of earth near the left bank of the Colorado River" used in connection with Corner III and Corner IV appearing on the plat and in the notes of survey accompanying the above mentioned Executive Order of March 30, 1870.

Please take all such actions as may be appropriate to implement the conclusions herein stated, including declaring null and void the above-mentioned 1928 resurvey and the plat respecting that resurvey of the western boundary of the Hay and Wood Reserve accepted January 23, 1931, and resurveying the Reserve to conform to the acreage description of 9114.81 acres. Correct Corner III and Corner IV should be reestablished in accordance with the courses and distances described in the plats and notes of the survey accompanying Executive Order of March 30, 1870, to replace the erroneous and rejected Corner III and Corner IV established by the 1928 resurvey.

It is also requested that a determination be made as to what third-party interests may have been established and that appropriate action by taken to subrogate such interests to the Fort Mojave Tribe in those instances in which it is determined that such third-party interests affect the lands inside the now recognized western boundary of the reservation.

Please note the official records accordingly so that henceforth such records will indicate the proper location of the western boundary of the Hay and Wood Reserve of the Fort Mojave Indian Reservation in the subject area.

(sgd) Rogers C. B. Morton

BIA, Area Director, Phoenix
Regional Solicitor, Sacramento
Field Solicitor, Phoenix

APPENDIX XII - COLORADO RIVER BASIN PROJECT ACT

1201 - S.1658, June 4, 1968

1202 - Colorado River Basin Project Act, September 30, 1968, Public Law 90-537

1203 - Excerpts of the Executive Summary Report of the Westwide Study Report

1204 - Report on Annual Consumptive Uses and Losses of Water From the Colorado River System

1201

88TH CONGRESS
1ST SESSION

S. 1658

IN THE SENATE OF THE UNITED STATES

JUNE 4, 1963

Mr. HAYDEN (for himself and Mr. GOLDWATER) introduced the following bill; which was read twice and referred to the Committee on Interior and Insular Affairs

A BILL

To authorize, construct, operate, and maintain the Central Arizona project, Arizona-New Mexico, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purposes of furnishing supplemental irrigation water and municipal water supplies to the water-deficient areas of Arizona and western New Mexico, through direct diversion or exchange of water, generation and sale of electric energy, control of floods, conservation and development of fish and wildlife resources, enhancement of recreation opportunities, and for other purposes, the Secretary of the Interior acting pursuant to the Federal reclamation laws (Act

of June 17, 1902, 32 Stat. 388, and Acts amendatory thereof or supplementary thereto), is authorized to construct, operate, and maintain the Central Arizona project, Arizona-New Mexico. The principal works of the project shall consist of the Bridge Canyon Dam, Reservoir, and Powerplant; Maxwell Dam, Reservoir, and power-pumping plant; Buttes Dam and Reservoir; Hooker Dam and Reservoir; Charleston Dam and Reservoir; Granite Reef Aqueduct and pumping plants; Tucson Aqueducts and pumping plants; Salt-Gila Aqueduct; canals; electrical transmission facilities, and related water distribution and drainage works.

SEC. 2. (a) Contracts to repay the portion of the cost of the Central Arizona project allocated to irrigation and assigned to be repaid by irrigation water users which are entered into pursuant to subsection (d), section 9, of the Reclamation Project Act of 1939 (53 Stat. 1187) as amended, shall provide for a basic repayment period of not more than fifty years after initiation of water service to any block of land plus a development period, if any, not to exceed ten years as determined by the Secretary.

(b) Rates charged for commercial power and for water for municipal, domestic, or industrial use shall be designed to return to the United States, within not more than fifty years from the completion of each unit of the project which serves those purposes, those costs of constructing, operating,

and maintaining that unit which are allocated to said purpose and interest on the unamortized balance of said construction allocation and, in addition, within the time specified in subsection (a) of this section, so much of the irrigation allocation for each block as is beyond the ability of the water users to repay.

(c) The interest rate to be used for purposes of computing interest during construction and interest on the unpaid balance of those portions of the reimbursable costs which are properly allocable to commercial power development and municipal and industrial water supply shall be determined by the Secretary of the Treasury, as of the beginning of the fiscal year in which this bill is enacted, on the basis of the computed average interest rate payable by the Treasury upon its outstanding marketable public obligations, which are neither due nor callable for redemption for fifteen years from date of issue. If the interest rate so computed is not a multiple of one-eighth of 1 per centum, the rate of interest to be used for these purposes shall be the multiple of one-eighth of 1 per centum next lower than the rate so computed: *Provided, however,* That as to Indian lands payment of construction costs within the capacity of the land to repay shall be subject to the Act of July 1, 1932 (47 Stat. 564).

SEC. 3. (a) The Secretary is authorized as a part of the

Central Arizona project to investigate, plan, construct, operate, and maintain public recreation facilities including access roads, to acquire or to withdraw from entry or other disposition under the public land laws such adjacent lands or interests therein as are necessary for present and future public recreation use, and to provide for public use and enjoyment of the same and of the water areas of the project in a manner consistent with the other project purposes. The Secretary is authorized to enter into agreements with State or local public agencies or other public entities for the operation, maintenance, or additional development of project lands or facilities to State or local agencies or other public entities by lease, transfer, exchange or conveyance, upon such terms and conditions as will best promote their development and operation in the public interest for recreation purposes. The cost of the undertakings described in this section, including costs of investigation, planning, operation, and maintenance and an appropriate share of the joint costs of the Central Arizona project shall be nonreimbursable.

(b) The Secretary may make such reasonable provision in connection with the Central Arizona project as, upon further study in accordance with section 2 of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661, 662), he finds to be required for the conservation and development of fish and wildlife. An appropriate

portion of the cost of the development shall be allocated as provided in said Act and it, together with the Federal operation and maintenance costs allocated to this function, shall be nonreimbursable.

(c) The Secretary is authorized to recognize area redevelopment as defined in Public Law 87–27 as a project function and to allocate such costs to this function as appropriate. The costs so allocated shall be nonreimbursable.

SEC. 4. Nothing contained in this Act shall be construed to alter, amend, repeal, construe, interpret, modify, or be in conflict with the provisions of the Boulder Canyon Project Act (45 Stat. 1057), the Boulder Canyon Project Adjustment Act (54 Stat. 774), the Colorado River compact, the Upper Colorado River Basin compact, the Rio Grande compact of 1938, or the Treaty with the United Mexican States (Treaty Series 994).

SEC. 5. There is hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be required to carry out the purposes of this Act.

88TH CONGRESS
1ST SESSION

S. 1658

A BILL

To authorize, construct, operate, and maintain the Central Arizona project, Arizona-New Mexico, and for other purposes.

By Mr. HAYDEN and Mr. GOLDWATER

JUNE 4, 1963

Read twice and referred to the Committee on Interior and Insular Affairs

Public Law 90-537
90th Congress, S. 1004
September 30, 1968

An Act

To authorize the construction, operation, and maintenance of the Colorado River Basin project, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

TITLE I—COLORADO RIVER BASIN PROJECT: OBJECTIVES

Colorado River Basin Project Act.

SEC. 101. That this Act may be cited as the "Colorado River Basin Project Act".

82 STAT. 885

82 STAT. 886

SEC. 102. (a) It is the object of this Act to provide a program for the further comprehensive development of the water resources of the Colorado River Basin and for the provision of additional and adequate water supplies for use in the upper as well as in the lower Colorado River Basin. This program is declared to be for the purposes, among others, of regulating the flow of the Colorado River; controlling floods; improving navigation; providing for the storage and delivery of the waters of the Colorado River for reclamation of lands, including supplemental water supplies, and for municipal, industrial, and other beneficial purposes; improving water quality; providing for basic public outdoor recreation facilities; improving conditions for fish and wildlife, and the generation and sale of electrical power as an incident of the foregoing purposes.

(b) It is the policy of the Congress that the Secretary of the Interior (hereinafter referred to as the "Secretary") shall continue to develop, after consultation with affected States and appropriate Federal agencies, a regional water plan, consistent with the provisions of this Act and with future authorizations, to serve as the framework under which projects in the Colorado River Basin may be coordinated and constructed with proper timing to the end that an adequate supply of water may be made available for such projects, whether heretofore, herein, or hereafter authorized.

TITLE II—INVESTIGATIONS AND PLANNING

SEC. 201. Pursuant to the authority set out in the Reclamation Act of June 17, 1902, 32 Stat. 388, and Acts amendatory thereof or supplementary thereto, and the provisions of the Water Resources Planning Act of July 22, 1965, 79 Stat. 244, as amended, with respect to the coordination of studies, investigations and assessments, the Secretary of the Interior shall conduct full and complete reconnaissance investigations for the purpose of developing a general plan to meet the future water needs of the Western United States. Such investigations shall include the long-range water supply available and the long-range water requirements in each water resource region of the Western United States. Progress reports in connection with these investigations shall be submitted to the President, the National Water Commission (while it is in existence), the Water Resources Council, and to the Congress every two years. The first of such reports shall be submitted on or before June 30, 1971, and a final reconnaissance report shall be submitted not later than June 30, 1977: *Provided*, That for a period of ten years from the date of this Act, the Secretary shall not undertake reconnaissance studies of any plan for the importation of water into the Colorado River Basin from any other natural river drainage basin lying outside the States of Arizona, California, Colo-

43 USC 371.
42 USC 1962 note.

Reports.

20-174 (427) O - 68

rado, New Mexico, and those portions of Nevada, Utah, and Wyoming
82 STAT. 886 which are in the natural drainage basin of the Colorado River.

82 STAT. 887 SEC. 202. The Congress declares that the satisfaction of the requirements of the Mexican Water Treaty from the Colorado River constitutes a national obligation which shall be the first obligation of any water augmentation project planned pursuant to section 201 of this Act and authorized by the Congress. Accordingly, the States of the Upper Division (Colorado, New Mexico, Utah, and Wyoming) and the States of the Lower Division (Arizona, California, and Nevada) shall be relieved from all obligations which may have been imposed
63 Stat. 31. upon them by article III(c) of the Colorado River Compact so long as the Secretary shall determine and proclaim that means are available and in operation which augment the water supply of the Colorado River system in such quantity as to satisfy the requirements of the Mexican Water Treaty together with any losses of water associated with the performance of that treaty: *Provided*, That the satisfaction of the requirements of the Mexican Water Treaty (Treaty Series 994, 59 Stat. 1219), shall be from the waters of the Colorado River pursuant to the treaties, laws, and compacts presently relating thereto, until such time as a feasibility plan showing the most economical means of augmenting the water supply available in the Colorado River below Lee Ferry by two and one-half million acre-feet shall be authorized by the Congress and is in operation as provided in this Act.

SEC. 203. (a) In the event that the Secretary shall, pursuant to section 201, plan works to import water into the Colorado River system from sources outside the natural drainage areas of the system, he shall make provision for adequate and equitable protection of the interests of the States and areas of origin, including assistance from funds specified in this Act, to the end that water supplies may be available for use in such States and areas of origin adequate to satisfy their ultimate requirements at prices to users not adversely affected by the exportation of water to the Colorado River system.

(b) All requirements, present or future, for water within any State lying wholly or in part within the drainage area of any river basin from which water is exported by works planned pursuant to this Act shall have a priority of right in perpetuity to the use of the waters of that river basin, for all purposes, as against the uses of the water delivered by means of such exportation works, unless otherwise provided by interstate agreement.

SEC. 204. There are hereby authorized to be appropriated such sums as are required to carry out the purposes of this title.

TITLE III—AUTHORIZED UNITS: PROTECTION OF EXISTING USES

SEC. 301. (a) For the purposes of furnishing irrigation water and municipal water supplies to the water-deficient areas of Arizona and western New Mexico through direct diversion or exchange of water, control of floods, conservation and development of fish and wildlife resources, enhancement of recreation opportunities, and for other purposes, the Secretary shall construct, operate, and maintain the Central Arizona Project, consisting of the following principal works: (1) a system of main conduits and canals, including a main canal and pumping plants (Granite Reef aqueduct and pumping plants), for diverting and carrying water from Lake Havasu to Orme Dam or suitable alternative, which system may have a capacity of 3,000 cubic feet per second or whatever lesser capacity is found to be feasible: *Provided*, That any capacity in the Granite Reef aqueduct in excess of 2,500 cubic feet per second shall be utilized for the conveyance of Colorado River water only when Lake Powell is full or releases of water are made from Lake

Powell to prevent the reservoir from exceeding elevation 3,700 feet above mean sea level or when releases are made pursuant to the proviso in section 602(a)(3) of this Act: *Provided further*, That the costs of providing any capacity in excess of 2,500 cubic feet per second shall be repaid by those funds available to Arizona pursuant to the provision of subsection 403(f) of this Act, or by funds from sources other than the development fund; (2) Orme Dam and Reservoir and power-pumping plant or suitable alternative; (3) Buttes Dam and Reservoir, which shall be so operated as not to prejudice the rights of any user in and to the waters of the Gila River as those rights are set forth in the decree entered by the United States District Court for the District of Arizona on June 29, 1935, in United States against Gila Valley Irrigation District and others (Globe Equity Numbered 59); (4) Hooker Dam and Reservoir or suitable alternative, which shall be constructed in such a manner as to give effect to the provisions of subsection (f) of section 304; (5) Charleston Dam and Reservoir; (6) Tucson aqueducts and pumping plants; (7) Salt-Gila aqueducts; (8) related canals, regulating facilities, hydroelectric powerplants, and electrical transmission facilities required for the operation of said principal works; (9) related water distribution and drainage works; and (10) appurtenant works.

(b) Article II(B)(3) of the decree of the Supreme Court of the United States in Arizona against California (376 U.S. 340) shall be so administered that in any year in which, as determined by the Secretary, there is insufficient main stream Colorado River water available for release to satisfy annual consumptive use of seven million five hundred thousand acre-feet in Arizona, California, and Nevada, diversions from the main stream for the Central Arizona Project shall be so limited as to assure the availability of water in quantities sufficient to provide for the aggregate annual consumptive use by holders of present perfected rights, by other users in the State of California served under existing contracts with the United States by diversion works heretofore constructed, and by other existing Federal reservations in that State, of four million four hundred thousand acre-feet of mainstream water, and by users of the same character in Arizona and Nevada. Water users in the State of Nevada shall not be required to bear shortages in any proportion greater than would have been imposed in the absence of this subsection 301(b). This subsection shall not affect the relative priorities, among themselves, of water users in Arizona, Nevada, and California which are senior to diversions for the Central Arizona Project, or amend any provisions of said decree.

(c) The limitation stated in subsection (b) of this section shall not apply so long as the Secretary shall determine and proclaim that means are available and in operation which augment the water supply of the Colorado River system in such quantity as to make sufficient mainstream water available for release to satisfy annual consumptive use of seven million five hundred thousand acre-feet in Arizona, California, and Nevada.

SEC. 302. (a) The Secretary shall designate the lands of the Salt River Pima-Maricopa Indian Community, Arizona, and the Fort McDowell-Apache Indian Community, Arizona, or interests therein, and any allotted lands or interests therein within said communities which he determines are necessary for use and occupancy by the United States for the construction, operation, and maintenance of Orme Dam and Reservoir, or alternative. The Secretary shall offer to pay the fair market value of the lands and interests designated, inclusive of improvements. In addition, the Secretary shall offer to pay toward the cost of relocating or replacing such improvements not to exceed $500,000 in the aggregate, and the amount offered for the actual relocation or replacement of a residence shall not exceed the difference between the fair market value of the residence and $8,000. Each community and

each affected allottee shall have six months in which to accept or reject the Secretary's offer. If the Secretary's offer is rejected, the United States may proceed to acquire the property interests involved through eminent domain proceedings in the United States District Court for the District of Arizona under 40 U.S.C., sections 257 and 258a. Upon acceptance in writing of the Secretary's offer, or upon the filing of a declaration of taking in eminent domain proceedings, title to the lands or interests involved, and the right to possession thereof, shall vest in the United States. Upon a determination by the Secretary that all or any part of such lands or interests are no longer necessary for the purpose for which acquired, title to such lands or interests shall be restored to the appropriate community upon repayment to the Federal Government of the amounts paid by it for such lands.

(b) Title to any land or easement acquired pursuant to this section shall be subject to the right of the former owner to use or lease the land for purposes not inconsistent with the construction, operation, and maintenance of the project, as determined by, and under terms and conditions prescribed by, the Secretary. Such right shall include the right to extract and dispose of minerals. The determination of fair market value under subsection (a) shall reflect the right to extract and dispose of minerals and all other uses permitted by this section.

(c) In view of the fact that a substantial portion of the lands of the Fort McDowell Mohave-Apache Indian Community will be required for Orme Dam and Reservoir, or alternative, the Secretary shall, in addition to the compensation provided for in subsection (a) of this section, designate and add to the Fort McDowell Indian Reservation twenty-five hundred acres of suitable lands in the vicinity of the reservation that are under the jurisdiction of the Department of the Interior in township 4 north, range 7 east; township 5 north, range 7 east; and township 3 north, range 7 east, Gila and Salt River base meridian, Arizona. Title to lands so added to the reservation shall be held by the United States in trust for the Fort McDowell Mohave-Apache Indian Community.

(d) Each community shall have a right, in accordance with plans approved by the Secretary, to develop and operate recreational facilities along the part of the shoreline of the Orme Reservoir located on or adjacent to its reservation, including land added to the Fort McDowell Reservation as provided in subsection (b) of this section, subject to rules and regulations prescribed by the Secretary governing the recreation development of the reservoir. Recreation development of the entire reservoir and federally owned lands under the jurisdiction of the Secretary adjacent thereto shall be in accordance with a master recreation plan approved by the Secretary. The members of each community shall have nonexclusive personal rights to hunt and fish on or in the reservoir without charge to the same extent they are now authorized to hunt and fish, but no community shall have the right to exclude others from the reservoir except by control of access through its reservation or any right to require payment by members of the public except for the use of community lands or facilities.

(e) All funds paid pursuant to this section, and any per capita distribution thereof, shall be exempt from all forms of State and Federal income taxes.

SEC. 303. (a) The Secretary is authorized and directed to continue to a conclusion appropriate engineering and economic studies and to recommend the most feasible plan for the construction and operation of hydroelectric generating and transmission facilities, the purchase of electrical energy, the purchase of entitlement to electrical plant capacity, or any combination thereof, including participation, operation, or construction by non-Federal entities, for the purpose of supplying the power requirements of the Central Arizona Project and

augmenting the Lower Colorado River Basin Development Fund: *Provided*, That nothing in this section or in this Act contained shall be construed to authorize the study or construction of any dams on the main stream of the Colorado River between Hoover Dam and Glen Canyon Dam.

(b) If included as a part of the recommended plan, the Secretary may enter into agreements with non-Federal interests proposing to construct thermal generating powerplants whereby the United States shall acquire the right to such portions of their capacity, including delivery of power and energy over appurtenant transmission facilities to mutually agreed upon delivery points, as he determines is required in connection with the operation of the Central Arizona Project. When not required for the Central Arizona Project, the power and energy acquired by such agreements may be disposed of intermittently by the Secretary for other purposes at such prices as he may determine, including its marketing in conjunction with the sale of power and energy from Federal powerplants in the Colorado River system so as to produce the greatest practicable amount of power and energy that can be sold at firm power and energy rates. The agreements shall provide, among other things, that—

(1) the United States shall pay not more than that portion of the total construction cost, exclusive of interest during construction, of the powerplants, and of any switchyards and transmission facilities serving the United States, as is represented by the ratios of the respective capacities to be provided for the United States therein to the total capacities of such facilities. The Secretary shall make the Federal portion of such costs available to the non-Federal interests during the construction period, including the period of preparation of designs and specifications, in such installments as will facilitate a timely construction schedule, but no funds other than for preconstruction activities shall be made available by the Secretary until he determines that adequate contractual arrangements have been entered into between all the affected parties covering land, water, fuel supplies, power (its availablity and use), rights-of-way, transmission facilities and all other necessary matters for the thermal generating powerplants;

(2) annual operation and maintenance costs shall be apportioned between the United States and the non-Federal interests on an equitable basis taking into account the ratios determined in accordance with the foregoing clause (1): *Provided, however*, That the United States shall share on the foregoing basis in the depreciation component of such costs only to the extent of provision for depreciation on replacements financed by the non-Federal interests; Operation and maintenance costs.

(3) the United States shall be given appropriate credit for any interests in Federal lands administered by the Department of the Interior that are made available for the powerplants and appurtenances;

(4) costs to be borne by the United States under clauses (1) and (2) shall not include (a) interest and interest during construction, (b) financing charges, (c) franchise fees, and (d) such other costs as shall be specified in the agreement.

(c) No later than one year from the effective date of this Act, the Secretary shall submit his recommended plan to the Congress. Except as authorized by subsection (b) of this section, such plan shall not become effective until approved by the Congress. Recommendations to Congress.

(d) If any thermal generating plant referred to in subsection (b) of this section is located in Arizona, and if it is served by water diverted from the drainage area of the Colorado River system above Lee Ferry, Arizona, apportionment of diverted water.

other provisions of existing law to the contrary notwithstanding, such consumptive use of water shall be a part of the fifty thousand acre-feet per annum apportioned to the State of Arizona by article III(a) of the Upper Colorado River Basin Compact (63 Stat. 31).

Irrigation restriction.

SEC. 304. (a) Unless and until otherwise provided by Congress, water from the Central Arizona Project shall not be made available directly or indirectly for the irrigation of lands not having a recent irrigation history as determined by the Secretary, except in the case of Indian lands, national wildlife refuges, and, with the approval of the Secretary, State-administered wildlife management areas.

Water supply, repayment contracts.

(b) (1) Irrigation and municipal and industrial water supply under the Central Arizona Project within the State of Arizona may, in the event the Secretary determines that it is necessary to effect repayment, be pursuant to master contracts with organizations which have power to levy assessments against all taxable real property within their boundaries. The terms and conditions of contracts or other arrangements whereby each such organization makes water from the Central Arizona Project available to users within its boundaries shall be subject to the Secretary's approval, and the United States shall, if the Secretary determines such action is desirable to facilitate carrying out the provisions of this Act, have the right to require that it be a party to such contracts or that contracts subsidiary to the master contracts be entered into between the United States and any user. The provisions of this clause (1) shall not apply to the supplying of water to an Indian tribe for use within the boundaries of an Indian reservation.

53 Stat. 1195.

(2) Any obligation assumed pursuant to section 9(d) of the Reclamation Project Act of 1939 (43 U.S.C. 485h(d)) with respect to any project contract unit or irrigation block shall be repaid over a basic period of not more than fifty years; any water service provided pursuant to section 9(e) of the Reclamation Project Act of 1939 (43 U.S.C. 485h(e)) may be on the basis of delivery of water for a period of fifty years and for the delivery of such water at an identical price per acre-foot for water of the same class at the several points of delivery from the main canals and conduits and from such other points of delivery as the Secretary may designate; and long-term contracts relating to irrigation water supply shall provide that water made available thereunder may be made available by the Secretary for municipal or industrial purposes if and to the extent that such water is not required by the contractor for irrigation purposes.

(3) Contracts relating to municipal and industrial water supply under the Central Arizona Project may be made without regard to the limitations of the last sentence of section 9(c) of the Reclamation Project Act of 1939 (43 U.S.C. 485h(c)); may provide for the delivery of such water at an identical price per acre-foot for water of the same class at the several points of delivery from the main canals and conduits; and may provide for repayment over a period of fifty years if made pursuant to clause (1) of said section and for the delivery of water over a period of fifty years if made pursuant to clause (2) thereof.

Water conservation.

(c) Each contract under which water is provided under the Central Arizona Project shall require that (1) there be in effect measures, adequate in the judgment of the Secretary, to control expansion of irrigation from aquifers affected by irrigation in the contract service area; (2) the canals and distribution systems through which water is conveyed after its delivery by the United States to the contractors shall be provided and maintained with linings adequate in his judgment to prevent excessive conveyance losses; and (3) neither the contractor nor the Secretary shall pump or permit others to pump ground water from within the exterior boundaries of the service area of a contractor receiving water from the Central Arizona Project for any use outside

said contractor's service area unless the Secretary and such contractor shall agree, or shall have previously agreed, that a surplus of ground water exists and that drainage is or was required. Such contracts shall be subordinate at all times to the satisfaction of all existing contracts between the Secretary and users in Arizona heretofore made pursuant to the Boulder Canyon Project Act (45 Stat. 1057).

43 USC 617-617t.

(d) The Secretary may require in any contract under which water is provided from the Central Arizona Project that the contractor agree to accept main stream water in exchange for or in replacement of existing supplies from sources other than the main stream. The Secretary shall so require in the case of users in Arizona who also use water from the Gila River system to the extent necessary to make available to users of water from the Gila River system in New Mexico additional quantities of water as provided in and under the conditions specified in subsection (f) of this section: *Provided*, That such exchanges and replacements shall be accomplished without economic injury or cost to such Arizona contractors.

Water exchanges.

(e) In times of shortage or reduction of main stream Colorado River water for the Central Arizona Project, as determined by the Secretary, users which have yielded water from other sources in exchange for main stream water supplied by that project shall have a first priority to receive main stream water, as against other users supplied by that project which have not so yielded water from other sources, but only in quantities adequate to replace the water so yielded.

Water shortage priorities.

(f)(1) In the operation of the Central Arizona Project, the Secretary shall offer to contract with water users in New Mexico for water from the Gila River, its tributaries and underground water sources in amounts that will permit consumptive use of water in New Mexico of not to exceed an annual average in any period of ten consecutive years of eighteen thousand acre-feet, including reservoir evaporation, over and above the consumptive uses provided for by article IV of the decree of the Supreme Court of the United States in Arizona against California (376 U.S. 340). Such increased consumptive uses shall not begin until, and shall continue only so long as, delivery of Colorado River water to downstream Gila River users in Arizona is being accomplished in accordance with this Act, in quantities sufficient to replace any diminution of their supply resulting from such diversion from the Gila River, its tributaries and underground water sources. In determining the amount required for this purpose full consideration shall be given to any differences in the quality of the waters involved.

New Mexico users, water exchange contracts.

(2) The Secretary shall further offer to contract with water users in New Mexico for water from the Gila River, its tributaries, and underground water sources in amounts that will permit consumptive uses of water in New Mexico of not to exceed an annual average in any period of ten consecutive years of an additional thirty thousand acre-feet, including reservoir evaporation. Such further increases in consumptive use shall not begin until, and shall continue only so long as, works capable of augmenting the water supply of the Colorado River system have been completed and water sufficiently in excess of two million eight hundred thousand acre-feet per annum is available from the main stream of the Colorado River for consumptive use in Arizona to provide water for the exchanges herein authorized and provided. In determining the amount required for this purpose full consideration shall be given to any differences in the quality of the waters involved.

(3) All additional consumptive uses provided for in clauses (1) and (2) of this subsection shall be subject to all rights in New Mexico and Arizona as established by the decree entered by the United States District Court for the District of Arizona on June 29, 1935, in United States against Gila Valley Irrigation District and others (Globe Equity Numbered 59) and to all other rights existing on the effective

82 STAT. 893

date of this Act in New Mexico and Arizona to water from the Gila River, its tributaries, and underground water sources, and shall be junior thereto and shall be made only to the extent possible without economic injury or cost to the holders of such rights.

Newly irrigated lands, restriction.

(g) For a period of ten years from the date of enactment of this Act, no water from the projects authorized by this Act shall be delivered to any water user for the production on newly irrigated lands of any basic agricultural commodity, as defined in the Agricultural Act of 1949, or any amendment thereof, if the total supply of such commodity for the marketing year in which the bulk of the crop would normally be marketed is in excess of the normal supply as defined in section 301(b)(10) of the Agricultural Adjustment Act of 1938 (52 Stat. 38), as amended (7 U.S.C. 1301), unless the Secretary of Agriculture calls for an increase in production of such commodity in the interest of national security.

63 Stat. 1051. 7 USC 1421 note.

62 Stat. 1251.

Main stream water cost.

SEC. 305. To the extent that the flow of the main stream of the Colorado River is augmented in order to make sufficient water available for release, as determined by the Secretary pursuant to article II(b)(1) of the decree of the Supreme Court of the United States in Arizona against California (376 U.S. 340), to satisfy annual consumptive use of two million eight hundred thousand acre-feet in Arizona, four million four hundred thousand acre-feet in California, and three hundred thousand acre-feet in Nevada, respectively, the Secretary shall make such water available to users of main stream water in those States at the same costs (to the extent that such costs can be made comparable through the nonreimbursable allocation to the replenishment of the deficiencies occasioned by satisfaction of the Mexican Treaty burden as herein provided and financial assistance from the development fund established by section 403 of this Act) and on the same terms as would be applicable if main stream water were available for release in the quantities required to supply such consumptive use.

Water salvage programs.

SEC. 306. The Secretary shall undertake programs for water salvage and ground water recovery along and adjacent to the main stream of the Colorado River. Such programs shall be consistent with maintenance of a reasonable degree of undisturbed habitat for fish and wildlife in the area, as determined by the Secretary.

Dixie project, integration.

SEC. 307. The Dixie Project, heretofore authorized in the State of Utah, is hereby reauthorized for construction at the site determined feasible by the Secretary, and the Secretary shall integrate such project into the repayment arrangement and participation in the Lower Colorado River Basin Development Fund established by title IV of this Act consistent with the provisions of the Act: *Provided*, That section 8 of Public Law 88-565 (78 Stat. 848) is hereby amended by deleting the figure "$42,700,000" and inserting in lieu thereof the figure "$58,000,000".

Fish and wildlife conservation and development.

SEC. 308. The conservation and development of the fish and wildlife resources and the enhancement of recreation opportunities in connection with the project works authorized pursuant to this title shall be in accordance with the provisions of the Federal Water Project Recreation Act (79 Stat. 213), except as provided in section 302 of this Act.

16 USC 460l-12 note.

Central Arizona project, appropriation.

SEC. 309. (a) There is hereby authorized to be appropriated for construction of the Central Arizona Project, including prepayment for power generation and transmission facilities but exclusive of distribution and drainage facilities for non-Indian lands, $832,180,000 plus or minus such amounts, if any, as may be justified by reason of ordinary fluctuations in construction costs as indicated by engineering cost indices applicable to the types of construction involved therein and, in addition thereto, such sums as may be required for operation and maintenance of the project.

(b) There is also authorized to be appropriated $100,000,000 for construction of distribution and drainage facilities for non-Indian lands. Notwithstanding the provisions of section 403 of this Act, neither appropriations made pursuant to the authorization contained in this subsection (b) nor revenues collected in connection with the operation of such facilities shall be credited to the Lower Colorado River Basin Development Fund and payments shall not be made from that fund to the general fund of the Treasury to return any part of the costs of construction, operation, and maintenance of such facilities. Non-Indian lands facilities, appropriation.

TITLE IV—LOWER COLORADO RIVER BASIN DEVELOPMENT FUND: ALLOCATION AND REPAYMENT OF COSTS: CONTRACTS

SEC. 401. Upon completion of each lower basin unit of the project herein or hereafter authorized, or separate feature thereof, the Secretary shall allocate the total costs of constructing said unit or features to (1) commercial power, (2) irrigation, (3) municipal and industrial water supply, (4) flood control, (5) navigation, (6) water quality control, (7) recreation, (8) fish and wildlife, (9) the replenishment of the depletion of Colorado River flows available for use in the United States occasioned by performance of the Water Treaty of 1944 with the United Mexican States (Treaty Series 994; 59 Stat. 1219), and (10) any other purposes authorized under the Federal reclamation laws. Costs of construction, operation, and maintenance allocated to the replenishment of the depletion of Colorado River flows available for use in the United States occasioned by compliance with the Mexican Water Treaty (including losses in transit, evaporation from regulatory reservoirs, and regulatory losses at the Mexican boundary, incurred in the transportation, storage, and delivery of water in discharge of the obligations of that treaty) shall be nonreimbursable: *Provided*, That the nonreimbursable allocation shall be made on a pro rata basis to be determined by the ratio between the amount of water required to comply with the Mexican Water Treaty and the total amount of water by which the Colorado River is augmented pursuant to the investigations authorized by title II of this Act and any future Congressional authorization. The repayment of costs allocated to recreation and fish and wildlife enhancement shall be in accordance with the provisions of the Federal Water Project Recreation Act (79 Stat. 213): *Provided*, That all of the separable and joint costs allocated to recreation and fish and wildlife enhancement as a part of the Dixie project, Utah, shall be nonreimbursable. Costs allocated to nonreimbursable purposes shall be nonreturnable under the provisions of this Act. 16 USC 460l-12 note.

SEC. 402. The Secretary shall determine the repayment capability of Indian lands within, under, or served by any unit of the project. Construction costs allocated to irrigation of Indian lands (including provision of water for incidental domestic and stock water uses) and within the repayment capability of such lands shall be subject to the Act of July 1, 1932 (47 Stat. 564; 25 U.S.C. 386a), and such costs that are beyond repayment capability of such lands shall be nonreimbursable. Indian lands, repayment capability.

SEC. 403. (a) There is hereby established a separate fund in the Treasury of the United States to be known as the Lower Colorado River Basin Development Fund (hereafter called the "development fund"), which shall remain available until expended as hereafter provided. Lower Colorado River Basin Development Fund. Establishment.

(b) All appropriations made for the purpose of carrying out the provisions of title III of this Act shall be credited to the development Ante, p. 887.

fund as advances from the general fund of the Treasury, and shall be available for such purpose.

(c) There shall also be credited to the development fund—

(1) all revenues collected in connection with the operation of facilities authorized in title III in furtherance of the purposes of this Act (except entrance, admission, and other recreation fees or charges and proceeds received from recreation concessionaires), including revenues which, after completion of payout of the Central Arizona Project as required herein are surplus, as determined by the Secretary, to the operation, maintenance, and replacement requirements of said project;

Ante, p. 887.

(2) any Federal revenues from the Boulder Canyon and Parker-Davis projects which, after completion of repayment requirements of the said Boulder Canyon and Parker-Davis projects, are surplus, as determined by the Secretary, to the operation, maintenance, and replacement requirements of those projects: *Provided, however*, That the Secretary is authorized and directed to continue the in-lieu-of-tax payments to the States of Arizona and Nevada provided for in section 2(c) of the Boulder Canyon Project Adjustment Act so long as revenues accrue from the operation of the Boulder Canyon project; and

54 Stat. 775.
43 USC 618a.

(3) any Federal revenues from that portion of the Pacific Northwest-Pacific Southwest intertie located in the States of Nevada and Arizona which, after completion of repayment requirements of the said part of the Pacific Northwest-Pacific Southwest intertie located in the States of Nevada and Arizona, are surplus, as determined by the Secretary, to the operation, maintenance, and replacement requirements of said portion of the Pacific Northwest-Pacific Southwest intertie and related facilities.

Development fund revenue use.

(d) All moneys collected and credited to the development fund pursuant to subsection (b) and clauses (1) and (3) of subsection (c) of this section and the portion of revenues derived from the sale of power and energy for use in Arizona pursuant to clause (2) of subsection (c) of this section shall be available, without further appropriation, for—

(1) defraying the costs of operation, maintenance, and replacements of, and emergency expenditures for, all facilities of the projects, within such separate limitations as may be included in annual appropriation Acts; and

(2) payments to reimburse water users in the State of Arizona for losses sustained as a result of diminution of the production of hydroelectric power at Coolidge Dam, Arizona, resulting from exchanges of water between users in the States of Arizona and New Mexico as set forth in section 304(f) of this Act.

(e) Revenues credited to the development fund shall not be available for construction of the works comprised within any unit of the project herein or hereafter authorized except upon appropriation by the Congress.

(f) Moneys credited to the development fund pursuant to subsection (b) and clauses (1) and (3) of subsection (c) of this section and the portion of revenues derived from the sale of power and energy for use in Arizona pursuant to clause (2) of subsection (c) of this section in excess of the amount necessary to meet the requirements of clauses (1) and (2) of subsection (d) of this section shall be paid annually to the general fund of the Treasury to return—

(1) the costs of each unit of the projects or separable feature thereof authorized pursuant to title III of this Act which are allocated to irrigation, commercial power, or municipal and industrial water supply, pursuant to this Act within a period not

exceeding fifty years from the date of completion of each such unit or separable feature, exclusive of any development period authorized by law: *Provided*, That return of the cost, if any, required by section 307 shall not be made until after the payout period of the Central Arizona Project as authorized herein; and

(2) interest (including interest during construction) on the unamortized balance of the investment in the commercial power and municipal and industrial water supply features of the project at a rate determined by the Secretary of the Treasury in accordance with the provisions of subsection (h) of this section, and interest due shall be a first charge.

(g) All revenues credited to the development fund in accordance with clause (c)(2) of this section (excluding only those revenues derived from the sale of power and energy for use in Arizona during the payout period of the Central Arizona Project as authorized herein) and such other revenues as remain in the development fund after making the payments required by subsections (d) and (f) of this section shall be available (1) to make payments, if any, as required by sections 307 and 502 of this Act, and (2) upon appropriation by the Congress, to assist in the repayment of reimbursable costs incurred in connection with units hereafter constructed to provide for the augmentation of the water supplies of the Colorado River for use below Lee Ferry as may be authorized as a result of the investigations and recommendations made pursuant to section 201 and subsection 203(a) of this Act.

Interest rate.

(h) The interest rate applicable to those portions of the reimbursable costs of each unit of the project which are properly allocated to commercial power development and municipal and industrial water supply shall be determined by the Secretary of the Treasury, as of the beginning of the fiscal year in which the first advance is made for initiating construction of such unit, on the basis of the computed average interest rate payable by the Treasury upon its outstanding marketable public obligations which are neither due nor callable for redemption for fifteen years from the date of issue.

Annual budgets, submittal to Congress.

(i) Business-type budgets shall be submitted to the Congress annually for all operations financed by the development fund.

Report to Congress.

SEC. 404. On January 1 of each year the Secretary shall report to the Congress, beginning with the fiscal year ending June 30, 1969, upon the status of the revenues from and the cost of constructing, operating, and maintaining each lower basin unit of the project for the preceding fiscal year. The report of the Secretary shall be prepared to reflect accurately the Federal investment allocated at that time to power, to irrigation, and to other purposes, the progress of return and repayment thereon, and the estimated rate of progress, year by year, in accomplishing full repayment.

TITLE V—UPPER COLORADO RIVER BASIN: AUTHORIZATIONS AND REIMBURSEMENTS

SEC. 501. (a) In order to provide for the construction, operation, and maintenance of the Animas-La Plata Federal reclamation project, Colorado-New Mexico; the Dolores, Dallas Creek, West Divide, and San Miguel Federal reclamation projects, Colorado; and the Central Utah project (Uintah unit), Utah, as participating projects under the Colorado River Storage Project Act (70 Stat. 105; 43 U.S.C. 620), and to provide for the completion of planning reports on other participating projects, clause (2) of section 1 of said Act is hereby further amended by (i) inserting the words "and the Uintah unit" after the

word "phase" within the parenthesis following "Central Utah", (ii) deleting the words "Pine River Extension" and inserting in lieu thereof the words "Animas-La Plata, Dolores, Dallas Creek, West Divide, San Miguel", (iii) adding after the words "Smith Fork:" the proviso "*Provided*, That construction of the Uintah unit of the Central Utah project shall not be undertaken by the Secretary until he has completed a feasibility report on such unit and submitted such report to the Congress along with his certification that, in his judgment, the benefits of such unit or segment will exceed the costs and that such unit is physically and financially feasible, and the Congress has authorized the appropriation of funds for the construction thereof:". Section 2 of said Act is hereby further amended by (i) deleting the words "Parshall, Troublesome, Rabbit Ear, San Miguel, West Divide, Tomichi Creek, East River, Ohio Creek, Dallas Creek, Dolores, Fruit Growers Extension, Animas-La Plata", and inserting after the words "Yellow Jacket" the words "Basalt Middle Park (including the Troublesome, Rabbit Ear, and Azure units), Upper Gunnison (including the East River, Ohio Creek, and Tomichi Creek units), Lower Yampa (including the Juniper and Great Northern units), Upper Yampa (including the Hayden Mesa, Wessels, and Toponas units)"; (ii) by inserting after the word "Sublette" the words "(including a diversion of water from the Green River to the North Platte River Basin in Wyoming), Ute Indian unit of the Central Utah Project, San Juan County (Utah), Price River, Grand County (Utah), Gray Canyon, and Juniper (Utah)"; and (iii) changing the period after "projects" to a colon and adding the following proviso: "*Provided*, That the planning report for the Ute Indian unit of the Central Utah participating project shall be completed on or before December 31, 1974, to enable the United States of America to meet the commitments heretofore made to the Ute Indian Tribe of the Uintah and Ouray Indian Reservation under the agreement dated September 20, 1965 (Contract Numbered 14-06-W-194).". The amount which section 12 of said Act authorizes to be appropriated is hereby further increased by the sum of $392,000,000, plus or minus such amounts, if any, as may be required, by reason of changes in construction costs as indicated by engineering cost indices applicable to the type of construction involved. This additional sum shall be available solely for the construction of the Animas-La Plata, Dolores, Dallas Creek, West Divide, and San Miguel projects herein authorized.

Report to Congress.

(b) The Secretary is directed to proceed as nearly as practicable with the construction of the Animas-La Plata, Dolores, Dallas Creek, West Divide, and San Miguel participating Federal reclamation projects concurrently with the construction of the Central Arizona Project, to the end that such projects shall be completed not later than the date of the first delivery of water from said Central Arizona Project: *Provided*, That an appropriate repayment contract for each of said participating projects shall have been executed as provided in section 4 of the Colorado River Storage Project Act (70 Stat. 107) before construction shall start on that particular project.

43 USC 620c.

Animas-La Plata Federal reclamation project. Consent of Congress.

(c) The Animas-La Plata Federal reclamation project shall be constructed and operated in substantial accordance with the engineering plans set out in the report of the Secretary transmitted to the Congress on May 4, 1966, and printed as House Document 436, Eighty-ninth Congress: *Provided*, That construction of the Animas-La Plata Federal reclamation project shall not be undertaken until and unless the States of Colorado and New Mexico shall have ratified the following compact to which the consent of Congress is hereby given:

"ANIMAS-LA PLATA PROJECT COMPACT

"The State of Colorado and the State of New Mexico, in order to implement the operation of the Animas-La Plata Federal Reclamation Project, Colorado-New Mexico, a proposed participating project under the Colorado River Storage Project Act (70 Stat. 105; 43 U.S.C. 620) and being moved by considerations of interstate comity, have resolved to conclude a compact for these purposes and have agreed upon the following articles:

"ARTICLE I

"A. The right to store and divert water in Colorado and New Mexico from the La Plata and Animas River systems, including return flow to the La Plata River from Animas River diversions, for uses in New Mexico under the Animas-La Plata Federal Reclamation Project shall be valid and of equal priority with those rights granted by decree of the Colorado state courts for the uses of water in Colorado for that project, providing such uses in New Mexico are within the allocation of water made to that state by articles III and XIV of the Upper Colorado River Basin Compact (63 Stat. 31).

"B. The restrictions of the last sentence of Section (a) of Article IX of the Upper Colorado River Basin Compact shall not be construed to vitiate paragraph A of this article.

"ARTICLE II

"This Compact shall become binding and obligatory when it shall have been ratified by the legislatures of each of the signatory States."

(d) The Secretary shall, for the Animas-La Plata, Dolores, Dallas Creek, San Miguel, West Divide, and Seedskadee participating projects of the Colorado River storage project, establish the nonexcess irrigable acreage for which any single ownership may receive project water at one hundred and sixty acres of class 1 land or the equivalent thereof, as determined by the Secretary, in other land classes.

(e) In the diversion and storage of water for any project or any parts thereof constructed under the authority of this Act or the Colorado River Storage Project Act within and for the benefit of the State of Colorado only, the Secretary is directed to comply with the constitution and statutes of the State of Colorado relating to priority of appropriation; with State and Federal court decrees entered pursuant thereto; and with operating principles, if any, adopted by the Secretary and approved by the State of Colorado.

(f) The words "any western slope appropriations" contained in paragraph (i) of that section of Senate Document Numbered 80, Seventy-fifth Congress, first session, entitled "Manner of Operation of Project Facilities and Auxiliary Features", shall mean and refer to the appropriation heretofore made for the storage of water in Green Mountain Reservoir, a unit of the Colorado-Big Thompson Federal reclamation project, Colorado; and the Secretary is directed to act in accordance with such meaning and reference. It is the sense of Congress that this directive defines and observes the purpose of said paragraph (i), and does not in any way affect or alter any rights or obligations arising under said Senate Document Numbered 80 or under the laws of the State of Colorado.

SEC. 502. The Upper Colorado River Basin Fund established under section 5 of the Colorado River Storage Project Act (70 Stat. 107; 43 U.S.C. 620d) shall be reimbursed from the Colorado River Development Fund established by section 2 of the Boulder Canyon Project Adjustment Act (54 Stat. 774; 43 U.S.C. 618a) for the money expended heretofore or hereafter from the Upper Colorado River Basin

Fund to meet deficiencies in generation at Hoover Dam during the filling period of storage units of the Colorado River storage project pursuant to the criteria for the filling of Glen Canyon Reservoir (27 Fed. Reg. 6851, July 19, 1962). For this purpose, $500,000 for each year of operation of Hoover Dam and powerplant, commencing with fiscal year 1970, shall be transferred from the Colorado River Development Fund to the Upper Colorado River Basin Fund, in lieu of application of said amounts to the purposes stated in section 2(d) of the Boulder Canyon Project Adjustment Act, until such reimbursement is accomplished. To the extent that any deficiency in such reimbursement remains as of June 1, 1987, the amount of the remaining deficiency shall then be transferred to the Upper Colorado River Basin Fund from the Lower Colorado River Basin Development Fund, as provided in subsection (g) of section 403.

62 Stat. 264.
43 USC 618a.

TITLE VI—GENERAL PROVISIONS: DEFINITIONS: CONDITIONS

SEC. 601. (a) Nothing in this Act shall be construed to alter, amend, repeal, modify, or be in conflict with 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 against California and others (376 U.S. 340), or, except as otherwise provided herein, the Boulder Canyon Project Act (45 Stat. 1057), the Boulder Canyon Project Adjustment Act (54 Stat. 774; 43 U.S.C. 618a) or the Colorado River Storage Project Act (70 Stat. 105; 43 U.S.C. 620).

43 USC 617t.

Reports to the President, Congress, etc.

(b) The Secretary is directed to—

(1) make reports as to the annual consumptive uses and losses of water from the Colorado River system after each successive five-year period, beginning with the five-year period starting on October 1, 1970. Such reports shall include a detailed breakdown of the beneficial consumptive use of water on a State-by-State basis. Specific figures on quantities consumptively used from the major tributary streams flowing into the Colorado River shall also be included on a State-by-State basis. Such reports shall be prepared in consultation with the States of the lower basin individually and with the Upper Colorado River Commission, and shall be transmitted to the President, the Congress, and to the Governors of each State signatory to the Colorado River Compact; and

(2) condition all contracts for the delivery of water originating in the drainage basin of the Colorado River system upon the availability of water under the Colorado River Compact.

Federal officers and agencies, compliance.

(c) All Federal officers and agencies are directed to comply with the applicable provisions of this Act, and of the laws, treaty, compacts, and decree referred to in subsection (a) of this section, in the storage and release of water from all reservoirs and in the operation and maintenance of all facilities in the Colorado River system under the jurisdiction and supervision of the Secretary, and in the operation and maintenance of all works which may be authorized hereafter for the augmentation of the water supply of the Colorado River system. In the event of failure of any such officer or agency to so comply, any affected State may maintain an action to enforce the provisions of this section in the Supreme Court of the United States and consent is given to the joinder of the United States as a party in such suit or suits, as a defendant or otherwise.

SEC. 602. (a) In order to comply with and carry out the provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, and the Mexican Water Treaty, the Secretary shall propose criteria for the coordinated long-range operation of the reservoirs constructed and operated under the authority of the Colorado River Storage Project Act, the Boulder Canyon Project Act, and the Boulder Canyon Project Adjustment Act. To effect in part the purposes expressed in this paragraph, the criteria shall make provision for the storage of water in storage units of the Colorado River storage project and releases of water from Lake Powell in the following listed order of priority:

45 Stat. 1057.
63 Stat. 31.
59 Stat. 1219.
70 Stat. 105.
43 USC 620.
45 Stat. 1057.
54 Stat. 774.
43 USC 618a.

(1) releases to supply one-half the deficiency described in article III(c) of the Colorado River Compact, if any such deficiency exists and is chargeable to the States of the Upper Division, but in any event such releases, if any, shall not be required in any year that the Secretary makes the determination and issues the proclamation specified in section 202 of this Act;

(2) releases to comply with article III(d) of the Colorado River Compact, less such quantities of water delivered into the Colorado River below Lee Ferry to the credit of the States of the Upper Division from other sources; and

(3) storage of water not required for the releases specified in clauses (1) and (2) of this subsection to the extent that the Secretary, after consultation with the Upper Colorado River Commission and representatives of the three Lower Division States and taking into consideration all relevant factors (including, but not limited to, historic stream-flows, the most critical period of record, and probabilities of water supply), shall find this to be reasonably necessary to assure deliveries under clauses (1) and (2) without impairment of annual consumptive uses in the upper basin pursuant to the Colorado River Compact: *Provided*, That water not so required to be stored shall be released from Lake Powell: (i) to the extent it can be reasonably applied in the States of the Lower Division to the uses specified in article III(e) of the Colorado River Compact, but no such releases shall be made when the active storage in Lake Powell is less than the active storage in Lake Mead, (ii) to maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell, and (iii) to avoid anticipated spills from Lake Powell.

Criteria, submittal for review and comment.

(b) Not later than January 1, 1970, the criteria proposed in accordance with the foregoing subsection (a) of this section shall be submitted to the Governors of the seven Colorado River Basin States and to such other parties and agencies as the Secretary may deem appropriate for their review and comment. After receipt of comments on the proposed criteria, but not later than July 1, 1970, the Secretary shall adopt appropriate criteria in accordance with this section and publish the same in the Federal Register. Beginning January 1, 1972, and yearly thereafter, the Secretary shall transmit to the Congress and to the Governors of the Colorado River Basin States a report describing the actual operation under the adopted criteria for the preceding compact water year and the projected operation for the current year. As a result of actual operating experience or unforeseen circumstances, the Secretary may thereafter modify the criteria to better achieve the purposes specified in subsection (a) of this section, but only after correspondence with the Governors of the seven Colorado River Basin States and appropriate consultation with such State representatives as each Governor may designate.

Publication in Federal Register.

Report to Congress, etc.

(c) Section 7 of the Colorado River Storage Project Act shall be administered in accordance with the foregoing criteria.

SEC. 603. (a) Rights of the upper basin to the consumptive use of water available to that basin from the Colorado River system under the Colorado River Compact shall not be reduced or prejudiced by any use of such water in the lower basin.

(b) Nothing in this Act shall be construed so as to impair, conflict with, or otherwise change the duties and powers of the Upper Colorado River Commission.

SEC. 604. Except as otherwise provided in this Act, in constructing, operating, and maintaining the units of the projects herein and hereafter authorized, the Secretary shall be governed by the Federal reclamation laws (Act of June 17, 1902; 32 Stat. 388, and Acts amendatory thereof or supplementary thereto) to which laws this Act shall be deemed a supplement.

43 USC 371 note.

SEC. 605. Part I of the Federal Power Act (41 Stat. 1063; 16 U.S.C. 791a–823) shall not be applicable to the reaches of the main stream of the Colorado River between Hoover Dam and Glen Canyon Dam until and unless otherwise provided by Congress.

Definitions.

SEC. 606. As used in this Act, (a) all terms which are defined in the Colorado River Compact shall have the meanings therein defined;

(b) "Main stream" means the main stream of the Colorado River downstream from Lee Ferry within the United States, including the reservoirs thereon;

(c) "User" or "water user" in relation to main stream water in the lower basin means the United States or any person or legal entity entitled under the decree of the Supreme Court of the United States in Arizona against California, and others (376 U.S. 340), to use main stream water when available thereunder;

(d) "Active storage" means that amount of water in reservoir storage, exclusive of bank storage, which can be released through the existing reservoir outlet works;

(e) "Colorado River Basin States" means the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming;

(f) "Western United States" means those States lying wholly or in part west of the Continental Divide; and

(g) "Augment" or "augmentation", when used herein with reference to water, means to increase the supply of the Colorado River or its tributaries by the introduction of water into the Colorado River system, which is in addition to the natural supply of the system.

Approved September 30, 1968.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 1312 accompanying H. R. 3300 (Comm. on Interior & Insular Affairs) and No. 1861 (Comm. of Conference).
SENATE REPORT No. 408 (Comm. on Interior & Insular Affairs).
CONGRESSIONAL RECORD:
Vol. 113 (1967): Aug. 3, 4, 7, considered and passed Senate.
Vol. 114 (1968): May 15, 16, considered and passed House, amended, in lieu of H. R. 3300.
Sept. 5, House agreed to conference report.
Sept. 12, Senate agreed to conference report.

1203

REGIONAL PROBLEMS AND ISSUES

There are a number of critical problems and issues in the 11 Western States that, while not Westwide in scope, do involve two or more States or a major river basin. These have been classified as regional problems, of which nine have been identified. Four of these are centered in the Colorado River Basin and involve Colorado River salinity, Colorado River water supply, lower Colorado River management, and oil shale development in the Upper Colorado River Basin. Four occur in the Columbia River Basin and involve total water management of the Columbia River system, the Columbia River estuary, the Middle Snake River Canyon controversy, and erosion in the Palouse area. The ninth regional problem pertains to anadromous fisheries in the Pacific Northwest.

Colorado River Salinity.—As the waters of the Colorado River are put to consumptive use, the remaining waters are becoming progressively more saline, particularly in the lower reaches of the river. The concentrations of dissolved solids in the lower mainstream are already approaching the threshold limits for some uses. The primary agricultural impacts of increasing salinity will be in the Imperial, Coachella, Gila, and Yuma Valleys where a wide diversity of crops is produced. Adverse effects will also be experienced in Mexico. The primary impacts on municipal and industrial water supply will affect the Metropolitan Water District of southern California, the Las Vegas service area, and upon completion of the Central Arizona project the Phoenix and Tucson metropolitan areas.

The adverse effects of increasing salinity are primarily economic in character and confined to the consumptive uses of water. Instream uses of water for hydroelectric power production, for recreation, for fish and wildlife, and for overall environmental purposes will not be significantly affected. Recent studies by the Bureau of Reclamation estimated total annual direct and indirect economic losses of about $230,000 for each part per million of future increase in salinity of the Colorado River at Imperial Dam. Taking as a base the acceptable salinity levels of 500 p/m for municipal and industrial supplies and 750 p/m for agricultural use, the total damages attributable to salinity in the Colorado River system for 1973 were about $53 million. By the year 2000 these damages to the total regional economy are expected to reach $124 million per year if no control measures are applied.

The 1972 Joint Federal-State Enforcement Conference on the matter of pollution of the interstate water of the Colorado River and its tributaries initiated new efforts to establish an overall salinity control policy for the river. The seven basin State conferees and Federal representatives concluded that such a policy should have as its objective the maintenance of salinity concentration at or below levels found in the lower main stem while the upper basin continues to develop its compact apportioned water. The 1972 Federal Water Pollution Control Act Amendments have been interpreted by the Environmental Protection Agency to require the establishment of numerical salinity standards on the Colorado River. Another related matter that highlights the need for basinwide salinity controls is a recently executed agreement with Mexico to resolve the international salinity problem with Mexico. Under that agreement, water delivered to Mexico shall have an average annual salinity of no more than 115 p/m (plus or minus 30 p/m) over the average annual salinity of waters arriving at Imperial Dam.

Adequate studies have not been completed to identify accurately the quantitative contribution of salinity concentrations from various sources in the basin, but the order of magnitude is (1) natural sources, (2) irrigation sources, (3) reservoir evaporation, (4) out-of-basin export, and (5) municipal and industrial sources.

Solutions to the salinity problems on the Colorado River will result from the cooperative efforts of all involved Federal, State, and local agencies and organizations. The primary study effort under way at this

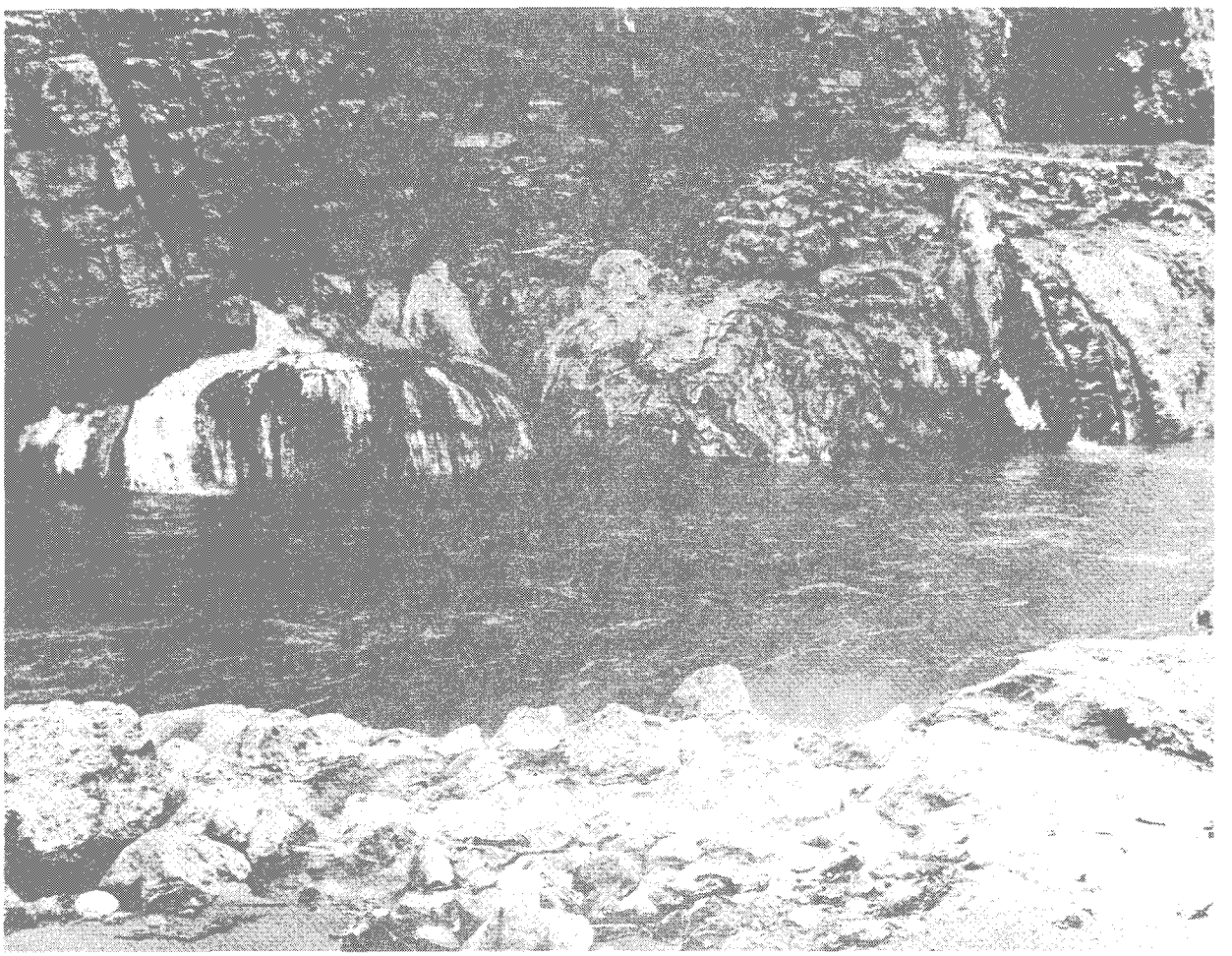


Figure 17. LaVerkin Springs discharging highly saline water into Virgin River, Utah.

time is the Bureau of Reclamation's Colorado River Water Quality Improvement Program (CRWQIP).

Working with several of the States involved, a comprehensive investigation program was structured and launched by the Bureau of Reclamation in FY 1972. Emphasis is placed on controlling salinity from irrigation, diffuse and point sources. Nonstructural measures, such as improving irrigation efficiency, river system management, water system management and utilizing return flows, are being given prime consideration. Other techniques such as structural control of point sources, weather modification, desalting of seawater and geothermal brines, land and vegetation management, erosion control, and waste-water utilization, are undergoing additional research and development to identify their prospects for water quality improvement.

An impressive start towards solving the Colorado River salinity problem is provided by Public Law 93-320, the Colorado River Basin Salinity Control Act of June 24, 1974. Title I of the act authorizes a series of undertakings, including the construction of a desalting plant to treat approximately 129 million gallons per day of drain water from the Wellton-Mohawk division of the Gila project, Arizona, to carry out the commitments of the United States in its recent agreement with Mexico, Minute 242 of the International Boundary and Water Commission, United States and Mexico.

Title II of the act authorizes four salinity control units upstream from Imperial Dam as the initial stage of the Colorado River Basin salinity control program — the Paradox Valley and Grand Valley units in Colorado, the Crystal Geyser unit in Utah, and the Las

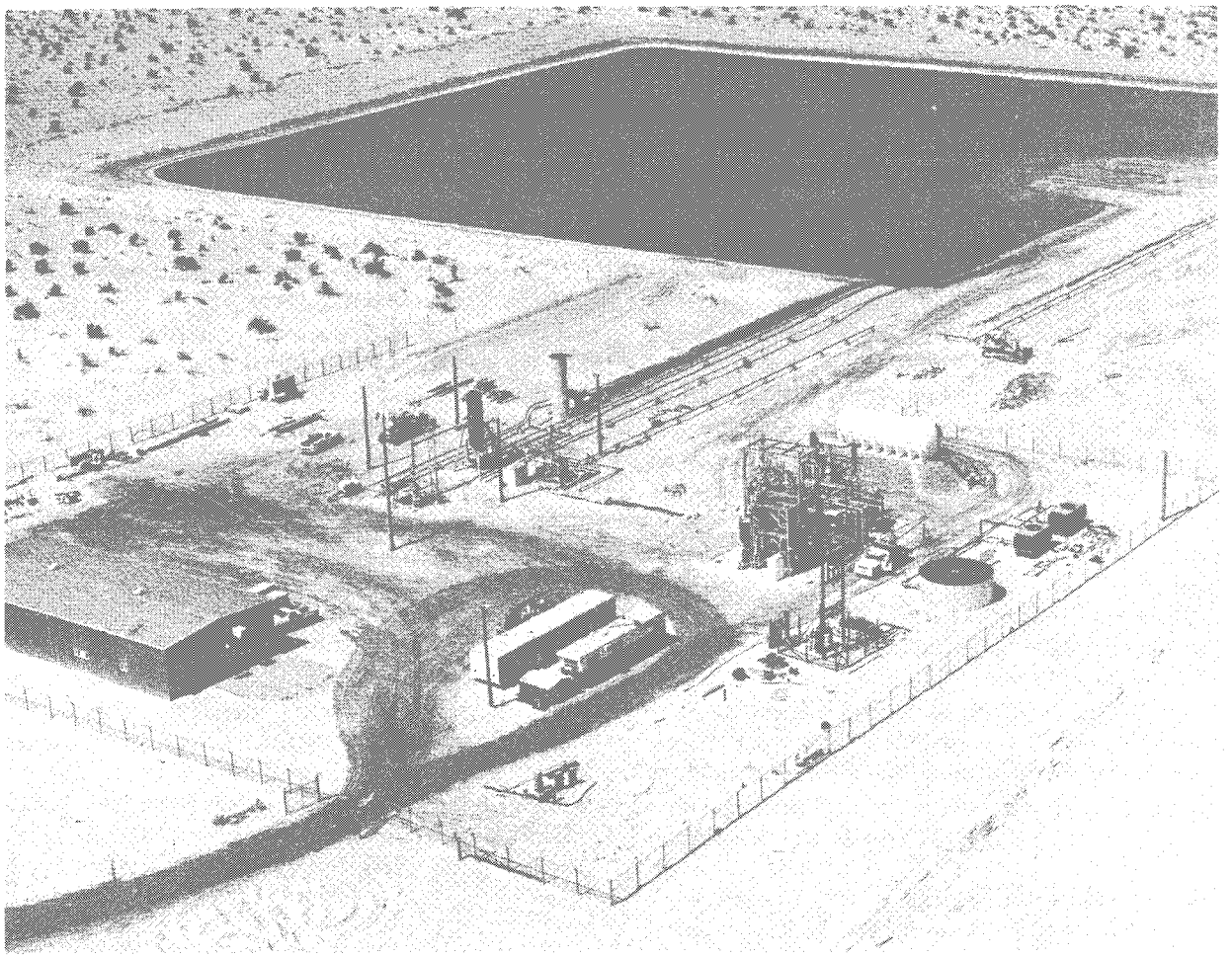


Figure 18. Geothermal test facility, Imperial Valley, California.

Vegas Wash unit in Nevada. Further, Title II prescribes that the costs of the initial units shall be allocated as follows: 75 percent to be nonreimbursable and 25 percent between the Upper Colorado River Basin Fund and the Lower Colorado River Basin Development Fund. The costs allocated to the Upper and Lower Basin funds are to be repaid without interest within 50 years from the date when each unit is in operation.

There is no one complete solution to the complex problem of salinity control in the Colorado River. A salinity control program should be regarded as but one element in a matrix of solutions which ultimately will form a comprehensive plan of management for the total water resources of the Colorado River Basin. Other elements include the planning and operation of interrelated structures, augmentation of the river, possible legal and institutional changes, new management techniques, increased efficiency in present use, and future development of basin water resources.

The Colorado River Water Quality Improvement Program should be continued on an accelerated basis to implement those investigations or programs that are considered cost effective and demonstrate immediate program benefits. Related programs of the Environmental Protection Agency, Department of Agriculture and Land Management agencies

should be accelerated as needed to meet salinity control objectives.

Colorado River Water Supply.—The Colorado River is one of the most highly controlled rivers in the world. It is approaching that point, the initial operation of the Central Arizona project, when little usable water, if any, will ever escape from the basin to the Gulf of California. It is approaching that point also when the natural water supply of the river will be inadequate to meet all of the demands placed upon it.

The water supply of the river is adequate to meet the quantitative water demands of today and in the years immediately ahead. If the upper basin States, however, are to develop their resources at a rate commensurate with their expressed aspirations, it is a certainty that shortages will develop within a time frame that directly affects decisions which need to be made today. Studies indicate that, with a fairly intensive growth in the upper basin and without augmentation of the river, water shortages in the lower basin could emerge by 1995, and grow continually more severe thereafter. Shortages will occur periodically on upper basin tributaries. The overriding question then is on what water supply basis should the future of the Colorado River Basin service area be planned.

The Colorado River, supplying water to such metropolitan complexes as those along the coast of southern California, the Eastern Slope of the Rocky Mountains in Colorado, the Upper Rio Grande of New Mexico, and along the Wasatch Front in Utah, has a service area extending far beyond its physical drainage basin. In spite of its very meager water supply more water is exported from this system than from any other in the United States. More than half of the West's population is directly dependent on the Colorado River as a source of water.

The Colorado River is not only one of the most physically developed and controlled rivers in the Nation, it is also one of the most institutionally encompassed rivers in the country. There is no other river in the Western Hemisphere that has been the subject of so many disputes of such wide scope during the last half century as the Colorado River. These controversies have permeated the political, social, economic, and legal facets of the seven Colorado Basin States.

The many lawsuits and interregional and interstate compacts have resulted from a water supply which is inadequate to meet the existing and potential water demands within the seven Colorado River Basin States.

Two primary factors have led to the present water supply problems of the Colorado Basin. The first is that the Colorado River Basin simply does not yield sufficient water on a natural basis to permit full development of land and mineral resources; to provide for fish and wildlife and recreation; and to service other needs. The second is that the negotiators of the Colorado River Compact apportioned a water resource that, at the time of negotiations, appeared much larger than the river has subsequently yielded.

The waters of the Colorado River System are divided among the Upper Colorado Basin, the Lower Colorado Basin, the Republic of Mexico, and among the States of the upper and lower basins by interstate compacts, an international treaty, a Supreme Court decision, and by State and Federal legislation. Additional Congressional legislation, agreements with Mexico, and other documents affect and, in some instances, dictate how the river shall be managed and operated. Collectively, these various agreements, guides and directives are known as the "Law of the River."

Major benchmarks in the "Law of the River" are:

1. The Colorado River Compact of 1922 which divided the waters of the Colorado River System between the upper and lower basins.

2. The Boulder Canyon Act of 1928 which authorized the construction of Hoover Dam and Powerplant and the All-American Canal.
The act also sets the stage for division of lower mainstream waters among the lower basin States.

3. The Upper Colorado River Compact of 1948 that apportioned among the upper basin States the waters of the Colorado River allocated to the upper basin by the Colorado River Compact.

4. The Mexican Water Treaty of 1944 that obligated the United States to deliver 1.5 million

acre-feet to Mexico annually from the Colorado River.

5. The Colorado River Storage Project Act of 1965 which authorized several long-termed carry-over reservoir storage units in the upper basin which permit the upper basin to maximize the consumptive use of water within its Colorado River Compact apportionment.

6. The Supreme Court Decree in Arizona vs. California of March 9, 1964, which apportioned the lower basin supply of Colorado River water among the States of Arizona, California, and Nevada.

7. Colorado River Basin Project Act of 1968 which directed that diversions to the Central Arizona project in times of shortage shall be so limited as to, in effect, guarantee California the use of 4.4 million acre-feet of Colorado River water annually. It also declared that the satisfaction of the Mexican Water Treaty from the Colorado River constitutes a national obligation which shall be the first obligation of any water augmentation project planned pursuant to the act.

8. The Federal Water Pollution Control Amendments Act of 1972 which gives the Environmental Protection Agency certain responsibilities and authorities for controlling water quality on the Nation's rivers.

9. Minute 242 (1973) of the International Boundary and Water Commission, United States and Mexico, which requires the initiation of several actions which will reduce the salinity of Colorado River water deliveries to Mexico under the Mexican Water Treaty.

10. Colorado River Basin Salinity Control Act of 1974, which authorized construction of a desalting complex and salinity control units to control salinity and improve the quality of Colorado River water.

In negotiations leading to a number of the above documents, a water supply yield of the Colorado River was assumed that records of the past several decades have proven to be overly optimistic. For instance, at the time the Colorado River Compact was negotiated, existing records indicated that the average virgin runoff of the Colorado River at Lee Ferry was in excess of 18 million acre-feet. As of today, the long-term record (1906-1970) indicates a virgin yield at Lee Ferry of 14.9 million acre-feet, while for the period 1931-1964 the yield was only 12.9 million acre-feet.

With the above background in mind, attention can be focused on the current water supply problems of the Colorado River Basin. Today and for some years to come, the Colorado River should be able to meet all quantitative physical water demands. The upper basin States are meeting their Compact requirements and demands being placed on the river are being met. Lake Powell and Lake Mead are filling and, assuming average annual runoff conditions for the next few years, Lake Powell and Lake Mead will "spill" in the sense that they will be required to release water, other than Mexican Treaty waters, for which there will be no consumptive use in the United States. However, assuming a long-term average annual supply of 14.9 million acre-feet, sometime after the Central Arizona project is fully operational, the Colorado River will not yield enough water under normal circumstances to meet upper and lower basin demands, the Mexican Treaty obligations, and system losses. Thus, the Colorado River Basin faces future water shortages unless its natural flows are augmented or water-dependent basin development is curtailed. The extent and timing of these shortages will depend on the rate of future consumptive use development and the volumes of annual runoff.

There are several categories of potential shortages:

1. When California is first cut back from its present 5.1 million acre-feet annual consumptive use to 4.4 million acre-feet consumptive use a legitimate current demand on the river will not be

met in full because of limitations on basin water supply. Although California would still be receiving its basic Colorado River supply and even though it has available more expensive alternative supplies to offset the cutback, it could be said that a shortage exists;

2. At that time when the total annual water demands of the basin, including reservoir evaporation and other water losses, exceed the long-term average annual water supply, the basin will be in a water shortage status even though water demands could be met for a limited period by drawing on reservoir storage;

3. When Arizona must reduce its Colorado River consumptive uses below 2.8 million acre-feet per year a new shortage will occur;

4. When the upper basin reaches its assured annual consumptive use of 5.8 million acre-feet annually, a still different type of shortage will be reached. (The 5.8 million acre-feet annually is that assured amount remaining for use in the upper basin under adverse runoff conditions after it has met its obligation to deliver 75 million acre-feet to the lower basin each 10 years and if it is required to contribute 750,000 acre-feet annually toward meeting the Mexican Water Treaty obligation. The assured supply thus estimated is not to be construed as the limit of the upper basin apportionment, as it is recognized that there is not agreement among the States of the Colorado River Basin on how the Mexican Treaty obligation is to be shared prior to the time augmentation of the Colorado River is accomplished under the terms of the Colorado River Basin Act of 1968). Because of the long-term carry-over storage of Lake Mead and the upper basin storage project reservoirs, whenever shortages occur in the above categories such shortages likely will span several years;

5. Another category of shortage common to the river systems can occur in the upper basin tributaries above main storage units where the water supplies are not sufficiently regulated by long-term carry-over storage. In these circumstances, shortages can vary from as little as a month at a time to a year or more; and

6. Still another category of shortage is represented by the Gila River basin where the present consumptive uses far exceed the combined surface and ground-water recharge of the basin. A shortage has existed here for years.

To help predict future situations relating to both water supply shortages and water quality under varying assumptions, a mathematical model of the Colorado River referred to as the Colorado River Simulation Model (CRSM) was developed. The model receives projected hydrologic sequences and projected water demands, processes them through a comprehensive systems operation, and evaluates the results in terms of water supply versus water demand.

To explore various possible future Colorado River runoff conditions, hydrologic traces, or theoretical 30-year sequences of Colorado River flow, are generated for selected stations over the entire Colorado River Basin based on statistical parameters derived from historical data and modified as necessary to reflect the runoff period of 1914-65. This period of record was selected because the modified flow analysis for benchmark gaging stations was available. These data were prepared for the Upper Colorado Region Comprehensive Framework Study.

An almost infinite number of hydrologic traces can be generated. For the purpose of illustrating a range of possible future runoff sequences three hydrologic traces were structured. Trace A reflects a reasonably low runoff cycle with a 30-year mean estimated virgin flow at Lee Ferry of 13.2 million acre-feet. Trace C reflects a reasonably high runoff cycle of 15.5 million acre-feet. Trace B (14.1 million acre-feet) reflects a reasonable intermediate situation.

Alternative Future Water Demand Schedules.—The element of uncertainty in projecting the rate at which future water demands in the

Colorado River Basin will occur is limited almost exclusively to the upper basin. In the lower basin the major important factor is the date that the Central Arizona project will start to divert water. Thereafter, Arizona and California will be diverting water to the limits of their entitlements. Projects for Nevada involve relatively small quantities. Thus, the future pattern of deliveries to the states in the lower basin is firmly established.

By contrast current upper basin uses are well below the assured upper basin water supply. This situation permits significant expansion of consumptive use before the upper basin reaches the ceiling attainable within the Compact. The rate of which upper basin water demands will grow depends upon several factors — the rate at which authorized Federal projects in the upper basin will be constructed and put into operation; the rate at which oil shale, coal and other energy resources are exploited; the rate at which municipal and industrial uses will expand; the level of conversion of water now used for irrigation to other purposes; and the future availability of water.

To illustrate a range of possible future water demands, three alternative water demand schedules through the year 2000 were structured.

Alternative 1 projects a reasonably slow rate of future water demand buildup in the basin. It provides for a low level of Federal project construction and for limited future water demands to service energy resource development in the upper basin. The Central Arizona project is estimated to divert water initially in 1987. Specifically alternative 1 provides that, in addition to the Federal projects currently under construction (Navajo Indian Irrigation Project; Bonneville Unit, Central Utah project; and the Fryingpan-Arkansas project), the five upper basin projects authorized in the Colorado River Basin Project Act would be constructed and in operation by 1987. It provides for a total of 22,630 MW of thermal power, 1,797 million cubic feet per day of coal gasification capacity, and the production of 680,000 barrels of oil per day from oil shale. All other functions and non-Federal development were projected to increase at a restricted rate.

Alternative 2 is a middle-ground projection. It anticipates a moderate level of Federal project construction and a moderate increase in water demands to serve energy resource development in the upper basin. It projects initial Central Arizona project diversions in 1987. Specifically, it provides that, in addition to the Federal projects included in alternative 1, the Lyman project would be constructed by 1980 and some Ute Indian deferral lands and the Jensen unit of the Central Utah project would be constructed by 1995. Thermal power development increased to 28,060 MW, coal gasification capacity to 2,373 million cubic feet per day and oil production from oil shale to 1,315,000 barrels per day.

Alternative 3 projects a high level of future construction of Federal projects in the upper basin together with sharply increasing water demands to service development of energy resources in the upper basin. It projects initial diversions from the Central Arizona project by 1985. Thus, alternative 3 represents a reasonably high projection of future basin water demands. Specifically it provides for the construction of all Federal projects now authorized except those authorized in the Colorado River Basin Salinity Control Act of 1974 which have little effect on water quantities. Thermal power development increases to 32,560 MW. Coal gasification capacity is at 2,911 million cubic feet per day and oil production from oil shale is at 1,515,000 barrels per day. Other demands are also increased substantially.

In developing these alternative water demand schedules, extensive use was made of information in the Upper Colorado Region Comprehensive Framework Study. The projections of water demands for the energy function of thermal coal power generation, coal gasification and oil production from oil shale

were based largely on information in the Report on Water for Energy in the Upper Colorado River Basin, prepared by the U.S. Department of the Interior.

It should be noted that for alternative 1 only those plants reasonably sure of development were included and none subsequent to 1985 were included. For alternative 2 no plants subsequent to 1988 were projected but for alternative 3 potential plants through the year 2000 were included.

The three alternatives reflect three different rates of increase in future upper basin water use and are intended only for illustrative purposes to demonstrate the adequacy or inadequacy of Colorado River water supply under varying assumptions as to basin runoff and basin water demand. Consideration was not given as to whether projected water demands in the upper basin would exceed the upper basin's assured supply or whether such demands in any given state would exceed the state's allocation of upper basin water. It is realized that should such an event occur compensating steps would be necessary or water-based development restricted.

Water demand levels in the Lower Colorado River Basin reflect two future situations: prior to initial operation of the Central Arizona project and subsequent to initial operation. In the former situation, full demand levels can be met within compact and other limitations, whereas in the latter case, full demand levels by Arizona and California cannot always be met because of water supply limitations.

Results of Model Runs. — The Colorado River Simulation Model is in its trial stages. With the change from a single historical runoff sequence to several theoretically possible sequences, more testing will be required before there can be complete confidence in its operation and the answers it provides. The results given hereafter, thus, should be considered preliminary and subject to further analysis. There are, however, considered adequate for the purpose intended — that of demonstrating the adequacy or inadequacy of Colorado River water supply under varying future conditions.

The model operation assumed upper basin deliveries at Lee Ferry of at least 8.25 million acre-feet annually. It took into account all inflow and reservoir and river losses below Lee Ferry. It followed the operating criteria promulgated under provisions of Section 602(a) of the Colorado River Basin Project Act and accommodated the flood control operating criteria established by the Corps of Engineers. It recognized surplus and shortage levels at Lake Mead which governed the amount of releases for lower basin consumptive uses.

With three different projected runoff sequences and three different projected levels of basin water demand buildup, nine different patterns of future water supply-water demand situations were delineated through the model runs.

The combination of Trace A (low runoff) and Alternative 3 (high-water demands) presents an extremely poor picture of future water supply adequacy. While the situation portrayed by this combination should occur the chances of it materializing are quite small.

By combining Trace C (high runoff after CAP) with Alternative 1 (low-water demands) a highly favorable picture of future water supply adequacy is presented. The chances of this combination occurring likewise are quite small but probably not as remote as the Trace A — Alternative 1 combination.

The combination of Trace B — Alternative 2 presents a reasonable middle-ground picture.

The following table summarizes the results of the model runs for the three alternative demand schedules matched against the three hydrologic traces.

Results of model runs—Colorado River

Alternative demands and hydrologic traces	Estimated 30-year average annual virgin water supply at Lees-Ferry (million acre-feet)	Year CAP on line	Shortage conditions (1) California consumptive use cut back to 4.4 million acre-feet per year	(2) Year total basin water demands exceed long-term average virgin flow of 14.9 million acre feet	(3) Arizona consumptive use reduced to less than 2.8 million acre-feet per year	(4) Year upper basin demands equal to 5.8 million acre-feet	End of month contents December 2000 Lake Powell (million acre-feet	Lake Mead (million acre-feet)
ALT-1		1987						
A	13.2		1994	—	—	—	17.2	20.1
B	14.1		1988	—	1999	—	16.3	20.1
C	15.5		—	1987	—	—	25.7	26.4
ALT-2		1987						
A	13.2		1989	1987	—	—	15.8	18.7
B	14.1		1987	1988	1999	—	16.4	18.2
C	15.5		—	1987	—	—	25.6	26.5
ALT-3		1975						
A	13.2		1985	1987	2000	1993	12.9	16.0
B	14.1		1985	1988	1995	1995	14.0	14.7
C	15.5		—[1]	1985	—	1989	24.1	25.6

[1]In 1998 California was cut back to 4.4 million acre-feet, however, deliveries were greater than 4.4 million acre-feet the following two years.

The results of the model runs support the following observations:

1. Total basin water demands in all likelihood will exceed the long-term virgin flow of the Colorado River in the 1985-1988 time frame, coincidental with study projection dates for completion of the Central Arizona project.

2. Upper Basin water demands under the high-level growth projection could equal or exceed 5.8 million acre-feet in the 1990-1995 time period. However, in most cases, because of favorable runoff or storage conditions, the projected demands were met until after the year 2000.

3. Except under a runoff cycle higher than the long-term average, California's current water use will be cut back to 4.4 million acre-feet some time between 1985 and 1995, depending upon basin water demand growth and hydrologic conditions.

4. Except upon a runoff cycle higher than the long-term average, Arizona's consumptive use could be reduced below 2.8 million acre-feet some time within the 1995-2000 time period, depending upon basin water demand growth and hydrologic conditions.

5. Should the virgin runoff at Lee Ferry for the next 25 years average 15.5 million acre feet, all reasonably foreseeable basin water demands could be met through 2000, and both Lake Powell and Lake Mead would be full at that time.

6. Under any future runoff cycle other than an extremely adverse one, it is reasonably certain that the main Colorado River storage reservoirs will be

full or nearly so when the Central Arizona project initially diverts water. By drawing on reservoir storage, the basic water demands of the basin under most circumstances could be met at least through the year 1995. However, by the year 2000 reservoir storage could be sorely depleted or exhausted, depending upon actual hydrologic conditions and the growth of upper basin water demands. After that date, serious water shortages could be common except in periods of high runoff conditions. The basic keys to the extent and timing of future Colorado River water shortages are the runoff patterns and rates of growth of upper basin water demands after the Central Arizona project is completed.

In coping with the problem of potential future shortages, attention first should be directed to maximizing the yield and optimizing the use of the natural water supply of the Colorado River Basin consistent with environmental considerations. This can best be accomplished through a total water management program that includes such activities as coordinated operation of all major basin structures, conjunctive use of surface and ground-water supplies, increased irrigation efficiency, water salvage, and wastewater reclamation and reuse. Potential savings by these means could increase present supplies of the Colorado River by as much as 300,000 acre-feet annually.

It is evident that a total water management program can only delay and not prevent water shortages from occurring eventually. When such shortages do occur, there appear to be two alternative courses open.

The first would be to accept the limitation in water supply and pattern the economic and social future of the basin to that limitation. Such a situation could arise either from the desire of basin residents to restrict water-dependent developments or through the impracticality of augmentation for physical, economic, environmental, national policy, or other reasons. Under this option, there would still be choices of controlling the future economy of the basin through the transfer of irrigation water to other uses such as energy resource development, municipal and industrial, and recreation.

The second option would be to augment the flows of the Colorado River thus increasing its water supply and permitting continued growth of water-dependent development. Study has been given as part of the Westwide endeavor to means by which the river could be augmented including weather modification, desalting of seawater, and desalting of geothermal brines. Importation of water from resource regions outside the seven basin States was not considered in the Westwide Study because of restrictions on import studies contained in the Colorado River Basin Project Act. Although physically possible, importation of water to the Colorado River from other basins in the seven basin States does not appear practical.

Weather modification, from both a technical and economic viewpoint, appears to be a viable means of augmenting Colorado River runoff by from 0.9 to 1.3 million acre-feet annually. Social, legal, and environmental problems, however, remain to be resolved. Desalting of geothermal brines, although costly, may have augmentation potential. A decision point has not yet been reached on either its technical or economic feasibility. Desalting of seawater at this time appears to be too expensive to merit serious consideration as a source of large-scale augmentation.

To assist in resolving the water supply problems of the Colorado River Basin:

1. The total water management concept for the entire Colorado River Basin should continue to be broadened and perfected.

2. There should be an acceleration of programs of assistance to water users which would bring about the adoption of water management methods and practices to improve the efficiency of water use.

3. In conjunction with the States and other interested parties, a wide range of future water demand

schedules for both options should be projected to be matched on the Colorado River Simulation Model with varied projected hydrologic sequences and operating criteria to provide information on the extent and timing of potential future water shortages.

4. Investigations and activities to delineate the most appropriate means of augmenting the Colorado River as envisioned in the Colorado River Basin Project Act of 1968, should be given the highest priority.

a. The weather modification program of the Bureau of Reclamation should be continued aggressively with emphasis on resolving remaining sociological, legal, and environmental problems. A demonstration program of several years' duration, as presently proposed under the weather modification program, should be initiated in the Upper Colorado River Basin as soon as practicable to verify the findings to date, particularly as to the magnitude of increases and results of the weather modification program in runoff.

b. The ongoing geothermal desalting program of the Bureau of Reclamation on the East Mesa of Imperial Valley should be continued aggressively.

c. Other means of augmentation such as the importation of surface water, directly or by exchange, should be investigated as early as such studies would be appropriate and justified.

Lower Colorado River Main Stem Management. — The Colorado River from Lake Mead to its mouth has undergone more change in its physical characteristics and patterns of land and water use since completion of Hoover Dam in 1936 then any other major river in the Nation. These changes have created an urgent need for a comprehensive coordinated lower river water and related land management plan and operation.

Prior to Hoover Dam, the lower river was uncontrolled, alternating between massive floods in the spring and early summer and meager flows in the late summer and fall, a traditional feast or famine situation. The area was sparsely populated and the river was little used except for limited irrigation diversion when water was available and diversion structures hadn't been destroyed by spring floods. It was an area more suited for wildlife than for human occupancy.

Following construction of Hoover Dam and other major lower river regulatory and control structures, the character of the river and its uses changed radically. Today, the river is almost completely controlled. While still supporting important fish and wildlife populations, it has also become a center of intense human occupancy and activity. Recreation use of the river has burgeoned. More than 12 million people live within 4 hours driving time of the lower Colorado River and, during 1973, 8 million visitor-days of recreational use were recorded there. Urban and recreational home development along the main stem continues at an increasing pace. Much of the rapidly growing population growth in the area occurs along the river valley downstream from Davis Dam where the communities of Bullhead City, Havasu City, Parker, and Yuma in Arizona, and Blythe and Needles in California are located. Waste disposal associated with spreading population presents a water quality hazard.

Several reaches of the river below Davis Dam still remain relatively undeveloped. These areas have some of the best fish habitat along the river and provide many thousands of man-days of fishing each year. Water and heavy vegetative growth throughout the bottomlands provide a favorable wildlife habitat, with animal life concentrated in and adjacent to thickets. Marshlands provide a habitat which is rare in the arid Southwest and support many species of resident and migratory wildlife. In addition to the numerous game and species, several endangered species depend upon these areas. The preservation of this favorable habitat and its abundant wildlife is

Figure 19. Undeveloped river reach, Topock Gorge Area, Lower Colorado River main stem.

essential to the environmental quality of the valley. The important Imperial and Havasu National Wildlife Refuges are located here. Channelization of the river and phreatophyte control to conserve and salvage water have, in the past, conflicted with fish and wildlife management objectives. Reaches of the river have been identified as having potential for designation under the National Wild and Scenic River Act.

Irrigation is important with over 300,000 acres being irrigated along the river in Arizona and California. Water is diverted here also in irrigated lands in the Imperial and Coachella Valleys of California. The Colorado River, Yuma, Chemehuevi, and Mojave Indian Reservations are developing facilities to utilize their remaining shares of Colorado River water through expansion of irrigation, recreation, and urban development. Illegal land occupancy and diversion of flows for irrigation also are a problem.

The river is an important source of hydroelectric power for the Southwest with major power installations at Hoover, Parker, and Davis Dams. Numerous excellent sites exist for potential pumped-storage

hydroelectrical installations. The siting of several nuclear powerplants in the area is under active consideration.

Downstream from Davis Dam more than three-fourths of the area bordering the river is in Federal ownership or Indian trust. As most of the remaining lands suitable for potential resort and community use are federally administered, there are increasing demands, supported by the States, that public lands be released for development.

The long list of the lower river's attributes, uses, and problems — several of which are competing or conflicting — calls strongly for a total water and related land-management plan. These uses, attributes, and problems include: natural scenic values; heavy and growing water-based recreational use; urban and community growth including attendant waste disposal problems; major existing and potential hydroelectric developments; potential nuclear plant siting; important fish and wildlife habitat and resources; endangered species; extensive irrigation development; illegal trespass and occupancy; important Indian reservations; water salvage potentials through channelization and vegetation control; extensive Federal land ownership; and water quality improvement.

There is a long history of Federal actions dealing with water and related land management problems along the lower Colorado River which have not always been consistent or had common objectives. Several Federal agencies have been involved, including the Bureau of Reclamation, Bureau of Land Management, Fish and Wildlife Service, Bureau of Indian Affairs, National Park Service, and, more recently, the Environmental Protection Agency.

Land use and management plans and proposals have been made by the Bureau of Land Management and by the Bureau of Reclamation within the past decade and the Bureau of Land Management is presently preparing a Management Framework Plan for lands which it administers. Even though a multiplicity of research, investigation, management, and implementation programs are underway by various Federal agencies, there is an urgent need to organize a multiagency, multidisciplinary group with sufficient authority to formulate a comprehensive long-range plan for the lower river and to establish the means for coordinating the various Federal, State, and local programs and activities in the area. Such a group should be basically a Federal-State group with opportunity for active public involvement and should include representatives of all State and Federal agencies having designated responsibilities in the area as well as representatives of other public interests.

Oil Shale Development in the Upper Colorado Region. — The recent energy crisis, with its widespread shortages of gasoline and fuel oil, has focused national attention on the extensive reserves of oil locked in the oil shales of Colorado, Utah, and Wyoming. The higher grade deposits cover about 16,000 to 17,000 square miles and contain about 600 billion barrels of extractable oil, enough to meet oil requirements of the United States for 100 years at present rates of consumption. These reserves are approximately 17 times the present U.S. (including Alaska) proved crude petroleum reserves. By States, 80 percent of the high-grade reserves are in Colorado, 15 percent in Utah, and 5 percent in Wyoming. Most of the reserves are on public lands, but there are also significant reserves on private lands.

To adequately assess the water problems associated with oil shale development, it is necessary to determine when development will start and the rate and ultimate level of development. Several projections have been made by various authorities and they range in production capacity by 1985 of from 450,000 bpd to 1,200,000 bpd.

Water requirements for oil shale production and processing vary with the production rate, mining techniques, and methods adopted for spent shale disposal. Municipal water for the increased population to support the oil shale activity would also be needed but would be relatively minor compared with other requirements. Total estimated water requirements vary between 5,000 and 20,000 acre-feet per

year per 100,000 bpd production. On the basis of a projected industry output of 1 million bpd by 1985, the new water demands could vary between 50,000 and 200,000 acre-feet per year.

The Department of Interior's Final Environmental Impact Statement (EIS) for the Prototype Oil Shale Leasing Program assumes that oil shale development will take place in two phases: Phase I would be experimental, testing different mining techniques, land and water disposal, reclamation schemes, and environmental programs. In this phase, the three States are expected to produce, by 1983, about 500,000 bpd. Of this, 250,000 bpd would come from private lands in Colorado. Phase II is envisioned to evolve from Phase I research and development and thus could start between 1982 and 1986. Development would be continuous and dependent on Phase I technical results, the alternative cost of energy, extent of private development, environmental assessments, and other factors. About 500,000 bpd of capacity reasonably could be expected to be added in the early stages of Phase II for a total oil shale industry production of 1 million bpd by 1987.

For Phase I development, no severe problems are anticipated in meeting water demands. As development expands, however, problems will arise. Sources of water that may be used are ground water, diversions from uncontrolled streams, existing Federal reservoirs, newly constructed storage facilities both Federal and non-Federal, and conversion of agricultural water use to industrial use. As development proceeds, other problems may involve Colorado River Compact limitations on total consumptive use within the upper basin States.

The July 1974 report of the Department of the Interior on "Water for Energy in the Upper Colorado River Basin" projects an oil shale industrial output of 1,515,000 barrels of crude oil per day by the year 2000 with accompanying water requirements of 259,000 acre-feet per year.

Oil shale production and processing will be accompanied by a number of significant impacts. Socioeconomic impacts related to population growth could place heavy burdens on the existing housing, school, and public service facilities of the area. Environmental impacts could affect winter range for deer, high-quality trout streams, wild and scenic rivers, endangered species, and general scenic values. Land impacts will be those directly involved with the amount and kinds of disturbances resulting from exploration, mining, processing, and spent shale disposal activities. There also will be a significant new demand for energy to serve production and processing activities.

COLORADO RIVER SYSTEM CONSUMPTIVE USES AND LOSSES REPORT 1971-1975

UNITED STATES DEPARTMENT OF THE INTERIOR
Cecil D. Andrus, *Secretary*
BUREAU OF RECLAMATION
R. Keith Higginson, *Commissioner*
UPPER COLORADO REGION
David L. Crandall, *Regional Director*
LOWER COLORADO REGION
Manuel Lopez, Jr., *Regional Director*

March 1, 1978

Errata
to
Colorado River System Consumptive
Uses and Losses Report
1971-1975

Page VI — For Utah, Lower Basin Tributaries, change 1975 value from (32) to (83).

Page 4 — First column, line 19. Change quotation to equation.

Page 5 — Second Column, last paragraph, fifth line from the bottom. Change depleted to undepleted.

Page 8 — First column, second paragraph, sixth line. Change Virginia to Nevada.

Tables C-2 to 6 — "Total" values shown within the Tables are Upper and Lower Basin totals for Arizona, New Mexico, Utah, and Other and are not subtotals as the line spacing would imply.

Table C-4 — Change the figure 9 under "Export Within System" Column to the figure 0.

Table C-6 — Change the "Irrigated Agriculture" total for Utah from 460.2 to 560.2.

Tables UC-3 to 7 — General heading of "AGRICULTURE" should be over subheadings of "Irrigation," "Irrigation Reservoir Evaporation," "Stockpond Evaporation and Livestock," and "Total." General heading of "MUNICIPAL AND INDUSTRIAL" should be over subheadings of "Mineral Resources," "Thermal Electric Power," "Other," and "Total." General heading of "EXPORT" should be over "Outside System" and "Within System" only.

Table UC-3 to 7 — The following corrections should be made to values shown in the last column, "TOTAL."

Incorrect Values		Table				
State	Tributary	UC-3	UC-4	UC-5	UC-6	UC-7
Colorado	Upper Main Stem	1494.8	1558.2	1329.8	1627.0	1556.5
	San Juan-Colorado	52.3	87.5	90.5	95.2	101.0
Upper Basin	Upper Main Stem	1507.2	1569.8	1341.7	1639.8	1568.0
	San Juan-Colorado	298.0	335.3	483.3	375.8	465.3

Correct Values		Table				
State	Tributary	UC-3	UC-4	UC-5	UC-6	UC-7
Colorado	Upper Main Stem	1504.0	1566.1	1338.3	1630.1	1562.7
	San Juan-Colorado	43.1	79.6	82.0	92.1	94.8
Upper Basin	Upper Main Stem	1516.4	1577.7	1350.2	1642.9	1574.2
	San Juan-Colorado	288.8	327.4	474.8	372.7	459.1

Table LC-3 — Under the heading "Estimated Unmeasured Return Flow[2]," the total for 1974 should read 223.0 instead of 222.9. Under the heading "Estimated Consumptive Use Adjusted for Return Flow," the 1974 value for California should be 5,475.0 instead of 5,475.1 and the 1974 total value should be 6,736.4 instead of 6,736.5.

Table LC-5 — Replace ! mark with left parenthesis at bottom total under Export Column (Inside System). The general heading "EXPORT" should not include column headed "Total." Under the general heading "MUNICIPAL AND INDUSTRIAL[1]," the values for the Virgin Tributary, Lower Basin, for "Other[2]" and "Total" should read 1.2 and 1.2, respectively, instead of 0.1 and 3.6. Under the heading "EXPORT," the "Outside System" value for the Virgin Tributary, Lower Basin, should read 0.6 instead of being blank.

Table LC-7 and 8 — General heading "Agriculture" should not include column headed "Reservoir Evaporation."

Table LC-8 — Under the "Total" heading of "Municipal and Industrial" the Remaining Area, Nevada, value should read 84.2 instead of 90.1, the Gila, Lower Basin, value should read 332.0 instead of 331.9, and the Total, Lower Basin, value should be 461.8 instead of 461.7.

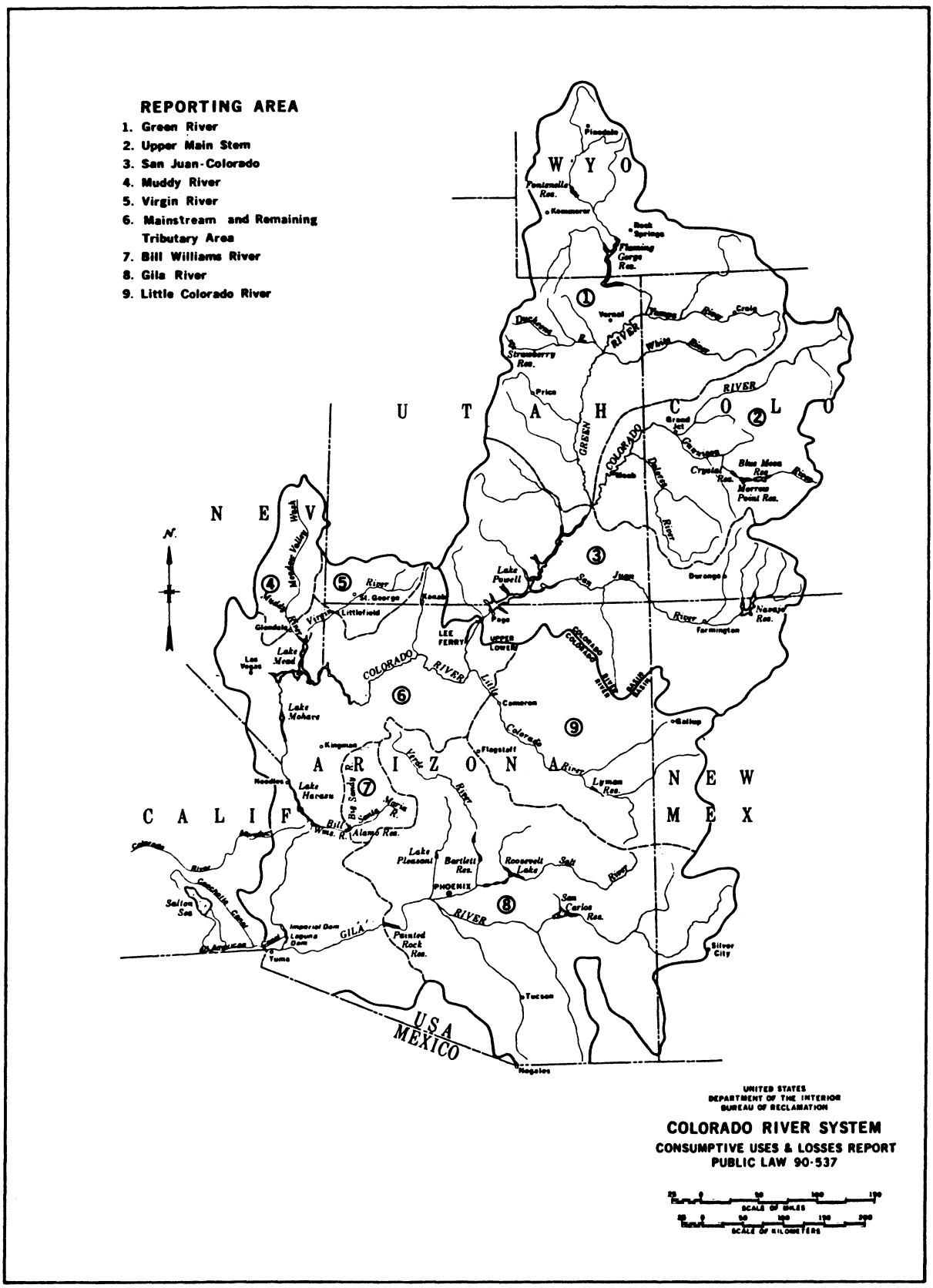
Table LC-9 — For Mainstream Consumptive Use and Exports, Arizona, the 1972 value of 1,129 should be in the "O" column instead of the "I" column. The 1972 Outflow Totals should be 8,498 instead of 4,498.

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.

FOREWORD

This report was prepared pursuant to the Colorado River Basin Project Act of 1968, Public Law 90–537. The act directs the Secretary of the Interior to "make reports as to the annual consumptive uses and losses of water from the Colorado River System after each successive five-year period, beginning with the five-year period starting on October 1, 1970. . . . Such reports shall be prepared in consultation with the States of the lower Basin individually and with the Upper Colorado River Commission and shall be transmitted to the President, the Congress, and to the Governors of each State signatory to the Colorado River Compact."

This report reflects the Department of the Interior's best estimate of actual consumptive uses and losses within the Colorado River Basin. The reliability of the estimate is affected by the availability of data and the current capabilities of data evaluation.


REPORTING AREA
1. Green River
2. Upper Main Stem
3. San Juan-Colorado
4. Muddy River
5. Virgin River
6. Mainstream and Remaining Tributary Area
7. Bill Williams River
8. Gila River
9. Little Colorado River
WYO
UTAH
COL
NEV
ARIZONA
NEW MEX
CALIF
Flaming Gorge Res.
Fontenelle Res.
Kemmerer
Rock Springs
Vernal
Price
Strawberry Res.
Green River
Colorado River
San Juan River
Lake Powell
Glen Canyon
Navajo Res.
Blue Mesa Res.
Morrow Point Res.
Crystal Res.
Durango
Farmington
Page
Lee Ferry
Upper Lovell
Cameron
Flagstaff
Gallup
Kingman
Lake Mohave
Lake Mead
Las Vegas
Littlefield
St. George
Virgin River
Muddy River
Meadow Valley Wash
Glendale
Lake Havasu
Bill Wms. R.
Alamo Res.
Santa Maria R.
Bill Williams River
Lake Pleasant
Bartlett Res.
Roosevelt Lake
Salt River
Verde River
Lyman Res.
PHOENIX
San Carlos Res.
Silver City
Tucson
Nogales
Pinal Rock Res.
Gila River
Yuma
Imperial Dam
Laguna Dam
Colorado River
Coachella Canal
Salton Sea
USA
MEXICO
N.
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLORADO RIVER SYSTEM
CONSUMPTIVE USES & LOSSES REPORT
PUBLIC LAW 90-537
SCALE OF MILES
SCALE OF KILOMETERS

SUMMARY

This report presents estimates of the consumptive uses and losses from the Colorado River system for each year from 1971 to 1975. It includes a breakdown of the beneficial consumptive use by major types of use (except mainstream reservoir evaporation), by major tributary streams, and, where possible, by individual States.

The main stem of the Colorado River rises in the Rocky Mountains of Colorado, flows southwesterly about 1,400 miles and terminates in the Gulf of California. Its drainage area of 242,000 square miles in this country represents one-fifteenth of the area of the United States. Water is used for irrigation, municipal and industrial purposes, electric power generation, mineral activities, livestock, fish and wildlife, and recreation. Large amounts are exported from the system to adjoining areas. The following table summarizes annual water use from the system by basins and States, including water use supplied by ground water overdraft. Distribution of water use by types of use from the various reporting areas is contained within the body of the report.

SUMMARY—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537
Water Use By States, Basins, and Tributaries [1]

(1,000 A.F.)

STATE AND BASIN OF USE	WATER YEAR					
	1971	1972	1973	1974	1975	Average 1971–75
Arizona	4756	5040	5128	5464	5514	5180
Upper Basin	(11)	(12)	(11)	(19)	(25)	(16)
Lower Basin Mainstream	(1181)	(1129)	(1068)	(1185)	(1208)	(1154)
Lower Basin Tributaries	(3564)	(3899)	(4049)	(4260)	(4281)	(4010)
California	5122	5328	5068	5475	4937	5186
Lower Basin	(5122)	(5328)	(5068)	(5475)	(4937)	(5186)
Colorado	1700	1775	1536	1855	1778	1729
Upper Basin	(1700)	(1775)	(1536)	(1855)	(1778)	(1729)
Nevada	131	148	154	160	154	149
Lower Basin Mainstream	(34)	(60)	(65)	(76)	(68)	(60)
Lower Basin Tributaries	(97)	(88)	(89)	(84)	(86)	(89)
New Mexico	213	218	357	237	322	270
Upper Basin	(180)	(183)	(320)	(200)	(290)	(235)
Lower Basin Tributaries	(33)	(35)	(37)	(37)	(32)	(35)
Utah	794	823	823	874	698	803
Upper Basin	(729)	(749)	(730)	(785)	(615)	(722)
Lower Basin Tributaries	(65)	(74)	(93)	(89)	(32)	(81)
Wyoming	334	304	304	364	291	319
Upper Basin	(334)	(304)	(304)	(364)	(291)	(319)
Other	1916	1919	2066	2175	2087	2033
Upper Basin Colorado River Storage Project Reservoir Evaporation	(458)	(477)	(502)	(596)	(607)	(528)
Lower Basin Mainstream Reservoir Evaporation and Channel Loss	(1458)	(1442)	(1564)	(1579)	(1480)	(1505)
Total—Colorado River System						
Upper Basin	2954	3023	2901	3223	2999	3021
Lower Basin Mainstream	6337	6517	6202	6736	6213	6400
Lower Basin Tributaries	3759	4096	4268	4470	4482	4215
Other—Reservoir Evaporation and Channel Loss	1916	1919	2066	2175	2087	2033
	14966	15555	15437	16604	15781	15669
Water Passing to Mexico	1561	1600	1594	1720	1656	1626
Treaty	(1501)	(1515)	(1444)	(1563)	(1429)	(1490)
Minutes 218, 241, and 242	(55)	(79)	(120)	(151)	(214)	(124)
Regulatory Waste	(5)	(6)	(30)	(6)	(13)	(12)
Total—Colorado River System and Water Passing to Mexico	16527	17155	17031	18324	17437	17295

[1] Onsite consumptive uses and losses; includes water uses satisfied by ground water overdraft.

CONTENTS

Foreword III
Summary V
General Location Map VI
Introduction 3
Authority 3
Plan of Study 3
Study Areas 5
Terminology 9
Methodology and Data Collection 10
Adequacy of Data 14
Beneficial Consumptive Uses and Losses 16

TABLES

Colorado River System

Table		Page
Summary—Colorado River System Consumptive Uses and Losses Report		vi
C–1	Drainage Areas of States and Major Tributary Systems	4
C–2	Water Use by States, Basins, and Types of Use, 1971	19
C–3	Water Use by States, Basins, and Types of Use, 1972	20
C–4	Water Use by States, Basins, and Types of Use, 1973	21
C–5	Water Use by States, Basins, and Types of Use, 1974	22
C–6	Water Use by States, Basins, and Types of Use, 1975	23

Upper Colorado River

UC–1	Main-stem Reservoir Evaporation, 1971–75	23
UC–2	Change in Contents—Major Reservoirs, 1971–75	24
UC–3	Water Uses in Tributary Areas by States, 1971	25
UC–4	Water Uses in Tributary Areas by States, 1972	26
UC–5	Water Uses in Tributary Areas by States, 1973	27
UC–6	Water Uses in Tributary Areas by States, 1974	28
UC–7	Water Uses in Tributary Areas by States, 1975	29

Lower Colorado River

LC–1	Mainstream Reservoir Evaporation and Channel Loss, 1971–75	30
LC–2	Change in Contents—Major Reservoirs, 1971–75	30
LC–3	Mainstream Water Uses and Exports by States and Mexico, 1971–75	31
LC–4	Water Uses in Tributary Areas by States, 1971	32
LC–5	Water Uses in Tributary Areas by States, 1972	33
LC–6	Water Uses in Tributary Areas by States, 1973	34
LC–7	Water Uses in Tributary Areas by States, 1974	35
LC–8	Water Uses in Tributary Areas by States, 1975	36
LC–9	Mainstream Channel Losses, Davis Dam to International Boundary, 1971–75	37

COLORADO RIVER SYSTEM
CONSUMPTIVE USES AND LOSSES REPORT
1971–1975

Introduction

The Colorado River system is composed of portions of seven States—Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. It has a drainage area of about 242,000 square miles and represents about one-fifteenth of the area of the United States. This report incorporates annual estimates of consumptive uses and losses of water from the system from 1971 to 1975. Wherever available, water use reports prepared in accordance with legal requirements concerning the operation of the Colorado River were utilized. Base data needed to estimate onsite consumptive uses were taken largely from existing reports and studies and from ongoing programs. Where current data were not available, estimated values were developed by various techniques and reasoned judgment. No new surveys or special studies were undertaken for this initial report. In general, methodology followed the techniques normally used within the system for estimating water use. 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

The authority for this report is contained in Public Law 90–537, the Colorado River Basin Project Act of 1968. Title VI, section 601(b)(1) of the act reads as follows:

(b) The Secretary is directed to—

(1) Make reports as to the annual consumptive uses and losses of water from the Colorado River system after each successive five-year period, beginning with the five-year period starting on October 1, 1970. Such reports shall include a detailed breakdown of the beneficial consumptive use of water on State-by-State basis. Specific figures on quantities consumptively used from the major tributary streams flowing into the Colorado River shall also be included on a State-by-State basis. Such reports shall be prepared in consultation with the States of the lower basin individually and with the Upper Colorado River Commission, and shall be transmitted to the President, the Congress, and to the Governors of each State signatory to the Colorado River Compact.

Plan of Study

After initial meetings with representatives of the Lower Basin States and the Upper Colorado River Commission, a proposed plan of study was presented for comment. Comments received largely concerned water accounting procedures, particularly the lack of uniformity and consistency within the system. This issue is longstanding and is related to the interpretation and implementation of the legal documentary controlling the operation of the Colorado River. In November 1974, a preliminary report was prepared which included estimates of beneficial consumptive use. Comments received from the States were essentially the same as for the plan of study. In the Upper Basin, the principal comment concerned the use of 1965 data bases developed for the Upper Colorado Region Comprehensive Framework Study, particularly irrigated acreage. In the Lower Basin, the main concerns were the lack of credit for unmeasured return flows originating from mainstream diversions and the failure to quantitatively recognize that ground water overdraft in the Gila River Basin satisfies a major portion of the beneficial consumptive use. To the degree possible, these concerns are addressed within this report.

UPPER COLORADO RIVER

The major tributary streams selected as reporting areas in the Upper Colorado River Basin are: Green River (Wyoming, Utah, Colorado); Upper Main Stem (Colorado, Utah), and San Juan-Colorado (Colorado,

New Mexico, Utah, Arizona).

The outflow point and drainage area for each is shown in table C–1. The boundaries of the reporting areas are shown on the frontispiece map.

The largest consumptive use of water in the Upper Colorado River Basin results from the irrigation of about 1.5 million acres of pasture and harvested cropland. In the Upper Basin, there is little opportunity for measuring irrigation consumptive use directly by inflow-outflow methods. Therefore it was necessary to determine this use empirically. Specifically, irrigation consumptive use rates were computed from recorded climate data for each of the reporting years and applied against the best estimates of irrigation acreage. The modified Blaney-Criddle consumptive use quotation was selected for use in the Upper Basin.

Irrigated acreage is the most important variable in the determination of irrigation consumptive use. Therefore, most of the data collection effort of this study was devoted to determining this item.

It was also necessary to compute reservoir evaporation losses empirically, by developing equations of net evaporation rates for each of the reporting years and applying these rates against the best estimates of reservoir surface area. For the Upper Basin portion of this study, evaporation losses are reported under the item of use most closely associated with the principal reservoir function.

Export of water out of the Colorado River system accounts for nearly one-quarter of the total uses and losses in the Upper Basin. For the purpose of this report, water exported across the basin divide was treated as an immediate loss to the river system. The values reported for the Upper Basin are composed of flows recorded at the diversion facilities and evaporation from reservoirs associated with export.

TABLE C–1—Colorado River System Consumptive Uses and Losses, P.L. 90–537
Drainage Areas by States (and Mexico) and Major Tributary Streams

Units=1,000 Square Miles

Major Tributary Streams and Their Selected Outflow Points	Wyoming	Colorado	Utah	New Mexico	Arizona	Nevada	California	Mexico	Total
Green River at Colorado River Confluence, Utah	17.1	10.6	17.0	—	—	—	—	—	44.8
Upper Main Stem at Green River Confluence, Utah	—	22.2	4.0	—	—	—	—	—	26.2
San Juan-Colorado at Lee Ferry, Arizona	—	5.8	16.2	9.7	6.9	—	—	—	38.6
Little Colorado River near Cameron, Arizona	—	—	—	5.3	21.2	—	—	—	26.5
Virgin River at Littlefield, Arizona	—	—	3.0	—	1.9	0.2	—	—	5.1
Muddy River near Glendale, Nevada	—	—	—	—	—	6.8	—	—	6.8
Bill Williams River below Alamo Dam, Arizona	—	—	—	—	4.7	—	—	—	4.7
Gila River below Painted Rock Dam, Arizona	—	—	—	5.6	44.2	—	—	(1.1)	49.8
Mainstream and Remaining Areas in Lower Basin	—	—	0.6	—	28.3	6.9	3.6	(0.1)	39.4
Colorado River System at Southerly International Boundary	17.1	38.6	40.9	20.6	107.2	13.9	3.6	(1.2)	241.9
Colorado River System above Lee Ferry	17.1	38.6	37.3	9.7	6.9	—	—	—	109.6
Colorado River System below Lee Ferry	—	—	3.6	10.9	100.3	13.9	3.6	(1.2)	132.3

For the determination of municipal and industrial uses, diversion and return flow records were obtained where readily available. However, because of the relatively small magnitude of these items in the Upper Basin, many of the reported values are estimated.

Throughout this study, considerable use was made of the techniques and data bases developed for the Upper Colorado Region Comprehensive Framework Study.

No attempt was made to deal with the question of channel losses and salvage. The values of consumptive use presented herein for the Upper Basin represent onsite uses and losses and are not necessarily equivalent to the corresponding depletion of flow at Lee Ferry, Arizona.

LOWER COLORADO RIVER

The consumptive use of water from the Colorado River mainstream and the New Mexico portion of the Gila River Basin was taken from annual reports prepared pursuant to articles V and VII of the decree of the Supreme Court of the United States in *Arizona* v. *California,* dated March 9, 1964. In response to the State's request for credit of unmeasured subsurface flows returning to the mainstream, a preliminary estimate has been made and credited arbitrarily to Arizona and California. A joint study is currently being conducted by the Geological Survey and the Bureau of Reclamation with the advice and guidance of the Task Force on Ground-Water Return Flows, which consists of State and Federal representatives, to determine the location and amounts of subsurface return flow. Until these studies are completed, any estimate of subsurface return flows must be considered preliminary and subject to revision. Surface water return flows through Las Vegas Wash from Lake Mead diversions were estimated and shown in the 1975 Article V accounting of mainstream use. Based on the same method, the 1971–74 return flows are included in this report. Other unmeasured return flows from Nevada diversions also occur but have not been accounted for herein.

In addition to the mainstream, six tributary areas were selected for the study: Little Colorado River, Arizona-New Mexico; Virgin River, Utah–Arizona; Muddy River, Nevada; Bill Williams River, Arizona; Gila River, Arizona–New Mexico; and remaining areas in Arizona, Nevada, and Utah.

Selected outflow points monitored by gaging stations and drainage areas are shown in table C–1. Within these selected areas, particularly in the Gila River Basin, numerous records of diversions are available; however, few return flows are recorded. For the most part, return flows are subsurface and not amenable to direct measurement. It is usually necessary to estimate consumptive use in these areas by empirical means. The land use, population, and production data from which estimates were made are from various current and past reports. This data base is believed to be generally adequate for the tributary areas of the Lower Colorado River system. Since much of this routinely published data follows political subdivision, considerable disaggregation of data is necessary to conform to the reporting areas selected. Certain types of water use, such as recreation, fish and wildlife, etc., are difficult to estimate because of a lack of current information and methodology.

Ground water overdrafts occur in Arizona and Nevada. For the purpose of this report, tributary consumptive use has not been modified to take into account that a major portion of these uses are supplied by ground water overdraft, nor were channel losses and salvage evaluated. Values of tributary consumptive use presented are for onsite uses and losses. It is recognized that under depleted conditions significant losses occurred on the tributaries by evaporation from water surfaces and transpiration from native vegetation prior to their confluence with the Colorado River mainstream.

Study Areas

The estimated drainage area of the Colorado River system in the United States is about 242,000 square miles, of which

109,600 square miles are above Lee Ferry. The river rises in the Rocky Mountains of Colorado and Wyoming, flows southwest about 1,400 miles, and terminates in the Gulf of California. The system consists of portions of seven States: California, Colorado, New Mexico, Nevada, Utah, Wyoming, and nearly all of Arizona. The drainage area was divided into ten reporting areas: three above Lee Ferry; the Lower Colorado River mainstream; and six tributary areas draining to the mainstream below Lee Ferry (see general location map). A brief description of the reporting areas follows.

UPPER COLORADO RIVER

Green River: The Green River reporting area comprises about 44,800 square miles in southwestern Wyoming, northwestern Colorado, and northeastern and east-central Utah.

Principal tributaries of the Green River are Blacks Fork, Henry's Fork, Hams Fork and Big Sandy Creek in southwestern Wyoming; Yampa and White Rivers on the western slope of the Continental Divide in northwestern Colorado; and the Price, Duchesne, and San Rafael Rivers in eastern Utah. These streams are fed by numerous headwater lakes.

The largest towns in the reporting area are Rock Springs and Green River in Wyoming; Vernal and Price in Utah; and Craig, Steamboat Springs, and Meeker in Colorado.

Mineral production is the major industry. Oil and natural gas are of primary importance, as are coal, gilsonite, asphalt, and trona (soda ash). Thermal electric power production is becoming an increasingly important industry.

Agriculture ranks near mineral production in importance to the local economy. Agricultural development is centered around livestock production, primarily beef cattle and sheep. Because of a short growing season, crop production is limited largely to small grain, hay, and pasture. These crops are used as winter livestock feed and complement the vast areas of public grazing lands.

Irrigation consumptive use accounts for nearly 80 percent of the total water use in the Green River reporting area. Nearly 690,000 acres of land are irrigated in an average year. Large exports of water are made to the Great Basin in Utah.

Upper Main Stem: The Upper Main Stem reporting area is drained by the Colorado River and its tributaries above the mouth of the Green River. Principal tributaries are the Roaring Fork, Gunnison, and Dolores Rivers. The Upper Main Stem reporting area consists of 26,200 square miles, with about 85 percent of the area in Colorado and the remainder in Utah.

Grand Junction, Montrose, and Glenwood Springs are the principal towns in Colorado. Moab is the only major community in Utah.

Mineral production is the predominant industry. This area is the Nation's chief source of molybdenum and is a major source of vanadium, uranium, lead, zinc, coal, and gilsonite.

In the Upper Main Stem reporting area, as in that of the Green River, agriculture centers around production of livestock which feeds on irrigated lands to complement the large areas of rangeland. There is somewhat more diversification of crops in the Upper Main Stem, however, with some major land areas devoted to sugar beets, beans, potatoes, table vegetables, and fruit. This diversification is made possible by climatic and topographic conditions which create favorable air drainage and minimize frost damage.

Irrigation consumptive use accounts for over half the water use in the Upper Main Stem reporting area. In an average year nearly 550,000 acres of land are irrigated. A considerable amount (almost one-third of the total basin use) of water is exported to serve agricultural and municipal needs on the eastern slope of the Continental Divide in Colorado.

San Juan-Colorado: The San Juan-Colorado reporting area is drained by the Colorado River and its tributaries below the mouth of the Green River and above Lee Ferry, Arizona. The largest of the tributary streams is the San Juan River which heads on the western slope of the Continental Divide in southwestern Colorado. Principal tributaries of the San

Juan River are the Navajo, Los Pinos, Animas, and La Plata Rivers. The other main tributaries in the basin are the Dirty Devil, Escalante, and Paria Rivers which drain a portion of the eastern slope of the Wasatch Plateau in Utah. The reporting area includes about 38,600 square miles in portions of Utah, New Mexico, Arizona, and Colorado.

The largest towns are Durango and Cortez in Colorado; Monticello and Blanding in Utah; and Farmington in New Mexico. Page, near Glen Canyon Dam, is the only community of significant size in Arizona. Most of the remaining Arizona portion is in the Navajo Indian Reservation.

Mining and agriculture form the economic base for the San Juan-Colorado reporting area. The agricultural development is similar to that of the Upper Main Stem with most of the cropland devoted to livestock feeds but with production of diversified market crops on lands with favorable air drainage. The main market crops are fruit, vegetables, and dry beans. Oil, natural gas, and coal are the most important minerals produced. Thermal electric power production is increasingly important to the economy of the area.

Irrigation accounts for the largest use of water, nearly 80 percent of the total basin use. About 240,000 acres of land are irrigated in an average year.

LOWER COLORADO RIVER

Mainstream below Lee Ferry, Arizona-California-Nevada: The Colorado River has a length of over 700 miles and a drainage area of 132,300 square miles within the Lower Colorado River system in the United States. From Lee Ferry to the headwaters of Lake Mead, the river flows through the spectacular canyons of northern Arizona, including the Grand Canyon. At Lake Mead, diversions are made to the rapidly expanding North Las Vegas-Las Vegas-Henderson-Boulder City area for municipal and industrial purposes. Below Lake Mead, the river courses through broad alluvial valleys interspersed with mountain chains. Lakes Mohave and Havasu provide flood control and regulatory storage below Lake Mead. In addition, Lake Havasu provides a forebay for pumped export to the Metropolitan Water District of Southern California and Lake Mohave reregulates Hoover Dam releases for power production and for deliveries to Mexico. Lesser structures downstream include Headgate Rock, Palo Verde, Senator Wash, Imperial, and Laguna Dams. Laguna and Senator Wash Dams provide reregulation capacity while the others are used principally for diversion.

Diversions below Lake Mead for agriculture, municipal and industrial, power, export, and other purposes are of the magnitude of 9 to 9.5 million acre-feet annually. A considerable portion of these diversions is satisfied from upstream return flows. Yuma and Lake Havasu City in Arizona, and Needles and Blythe in California are the major cities along the mainstream below Lake Mead. Current irrigated land adjacent to the mainstream is estimated to be about 351,000 acres. There has been a significant annual increase in the diversions for municipal and industrial purposes, particularly to Nevada.

Little Colorado River, Arizona-New Mexico: The Little Colorado River drainage area occupies a large part of northern Arizona and a portion of west-central New Mexico. It rises on the north slopes of the White Mountains about 20 miles above Springerville, Ariz.; has a mainstream length of about 356 miles; and joins the Colorado River on the east boundary of Grand Canyon National Park about 78 miles downstream from Glen Canyon Dam.

A series of saline springs near the mouth produce an estimated 160,000 acre-feet of water annually. The Geological Survey gaging station near Cameron is located in the Navajo Indian Reservation about 45 miles upstream from the mouth. Streamflow is undependable and erratic, subject to flash floods of considerable magnitude. During the period 1971–75, water year outflow at the gaging station near Cameron varied from the floodflow of 815,900 acre-feet in 1973 to 28,300 acre-feet in 1974. Only a minor development of the ground water has occurred because of low yields and poor quality. Excessive erosion and sediment deposition plague

the area. Agriculture is concentrated along the mainstream in the upper reaches of the river, on Silver Creek—a southern tributary—and on the Zuni River in New Mexico. Current irrigated acreage is estimated to be about 32,000; however, it is subject to variation because of frequent water shortages and inadequate storage facilities. Population is predominantly rural with a relatively large Indian segment. Principal cities include Flagstaff, Winslow, and Holbrook in Arizona, and Gallup and Zuni Pueblo in New Mexico. Leading industries include tourism, recreation, manufacturing, mining, and forest products.

Virgin River, Arizona-Utah: The Virgin River rises in western Kane County, Utah; flows southwesterly through the northwestern corner of Arizona; and empties into the northern extremity of the Overton Arm of Lake Mead in Virginia. The selected outflow point, the long-term Geological Survey gaging station at Littlefield, Ariz., is about 36 miles upstream from Lake Mead and about 10 miles above the Arizona-Nevada State line. The river is fed chiefly from tributaries heading in the southern high plateaus and mountains in Utah. Several springs contribute water to the river at a relatively uniform rate. The most significant of these springs are located near LaVerkin, Utah, and Littlefield, Ariz. Both springs are highly saline. Agricultural and municipal developments in Nevada below the selected outflow point are included in "remaining areas," as shown on the frontispiece map.

Ground water has been developed to a limited degree. The major irrigated areas are located in the LaVerkin-Hurricane-Santa Clara areas of Washington County, Utah, and in the Littlefield area of Mohave County, Ariz. There are small irrigated areas scattered throughout. Present irrigated area is estimated to be about 28,000 acres. Population is predominantly rural. St. George, Utah, is the principal city in the basin. Zion National Park, located near Springdale, Utah, attracts many visitors each year.

Muddy River, Nevada: The Muddy River, formerly a tributary of the Virgin River prior to the existence of Lake Mead, rises in the warm springs area of Clark County, Nev., about 10 miles northwest of Glendale. The river flows southeasterly for about 30 miles, and terminates at the northern extremity of the Overton Arm of Lake Mead. Meadow Valley Wash, the major tributary of Muddy River, rises in northeastern Lincoln County and flows south to join the parent stream at Glendale. The Geological Survey gaging station near Glendale is about 2.4 miles downstream from Meadow Valley Wash. Outflow varies little from year to year. Meadow Valley Wash, although perennial in the vicinity of Caliente, is normally dry in the last 50-mile reach above Glendale. Estimated irrigated acreage is about 8,900 acres located in the springs area and scattered throughout the upper reaches of Meadow Valley Wash. The entire basin is sparsely populated.

Bill Williams River, Arizona: The Bill Williams River is formed by the mergence of the Big Sandy and Santa Maria Rivers about 7.5 miles above existing Alamo Dam. The river above Alamo Dam drains an area of about 4,700 square miles from small, rough mountain ranges and intervening valleys in parts of Mohave, Yuma, and Yavapai Counties. Alamo Dam and Reservoir, a flood control structure completed in 1968, was built to protect downstream development along the Colorado River. A minimum pool is maintained for recreation and game management purposes. Releases from Alamo Dam and runoff from the intervening area flow westerly and join the Colorado River at the lower end of Lake Havasu. Estimated irrigated acreage is about 4,500 acres with most crops grown to supplement feed for livestock. The limited development in the basin is dominated by copper mining at the unincorporated town of Bagdad, present population about 2,000. A large portion of the water supply in the basin is obtained from groundwater pumpage. Releases from Alamo Dam during the 1971–75 period varied from 1,500 acre-feet in 1975 to 162,500 acre-feet in 1973.

Gila River, Arizona-New Mexico: The Gila River is the largest tributary to the Colorado River in the Lower Colorado River system. The drainage

area extends from the Continental Divide in New Mexico to the river's mouth near Yuma, Ariz. Elevations in the basin range from nearly 12,000 feet in the eastern mountains to about 150 feet at the mouth. The selected outflow point for the basin is at Painted Rock Dam, a flood control structure located about 20 miles west of Gila Bend, Ariz. The drainage area above Painted Rock Dam is about 50,900 square miles, of which 5,600 square miles are in New Mexico and 1,100 square miles in Mexico. The dam was constructed to protect agricultural and urban developments downstream. Major conservation storage reservoirs in the basin include the San Carlos Reservoir on the Gila River; Lake Pleasant on the Agua Fria River; and the six reservoirs of the Salt River Project. Total usable capacity of these reservoirs is about 3,180,000 acre-feet.

Nearly 75 percent of the population of the Lower Colorado River system lives in the Gila River Basin; most of these reside in the metropolitan Phoenix and Tucson areas. Industry and recreation play a large part in the economy.

About two-thirds of the agricultural development in the Lower Colorado River system is located in the Gila River Basin. This development is concentrated in the central area of Maricopa, Pinal, and Pima Counties and is supported to a large degree by a long-term overdraft of the ground water resources. Nearly all of the surface water resources in the basin have been developed for decades. Except for the infrequent major flood event, such as occurred in 1973, inflows to the Colorado River mainstream are negligible. Releases through Painted Rock Dam in water year 1973 totaled 412,700 acre-feet although only slightly more than 100,000 acre-feet reached the Colorado River. Construction of the Central Arizona Project is in progress. This project, which would divert Colorado River water at Lake Havasu to central Arizona, is intended to reduce ground-water pumpage and partially arrest the large annual increases in the depths to ground water.

Remaining area in Arizona, Nevada, and Utah: Outside of the Colorado River mainstream and flood plain and the selected tributaries, development for the most part is limited by the availability of water and the rugged terrain. In the Boulder City-Las Vegas Valley area there has been a significant increase in the municipal and industrial demand for water. Construction which would complete the Southern Nevada Water Project is scheduled to begin in 1977. Completion of the project would allow Nevada to essentially use its complete entitlement from the Colorado River. Most of the irrigated lands in this area are located in the lower reach of the Virgin River and Las Vegas Valley in Nevada, on Kanab Creek in Arizona and Utah, and the lower portions of the Gila and Bill Williams Rivers in Arizona. North Las Vegas, Las Vegas, Henderson, and Boulder City in Nevada, and Kingman and Williams in Arizona are the leading cities.

Terminology

The Colorado River is not only one of the most highly controlled rivers in the world, but is also one of the most institutionally encompassed. A multitude of legal documents, known collectively as the "Law of the River," affect and sometimes dictate its management and operation. Major documents include:

Colorado River Compact—1922
Boulder Canyon Project Act—1928
California Limitation Act—1929
California Seven Party Agreement—1931
Mexican Water Treaty—1944
Upper Colorado River Compact—1948
Colorado River Storage Project Act—1956
United States Supreme Court Decree in *Arizona* v. *California*—1964
Colorado River Basin Project Act—1968
Minute 242 of the International Boundary and Water Commission, United States and Mexico—1973
Colorado River Basin Salinity Control Act—1974

The Colorado River system is defined in the Colorado River Compact of 1922 as ". . . that portion of the Colorado River and its tributaries within the United States," whereas

the Colorado River Basin is defined as ". . .all of the drainage area of the Colorado River system and all other territory within the United States of America to which waters of the Colorado River system shall be beneficially applied." The compact divided the Colorado River Basin into two sub-basins—the "Upper Basin" and the "Lower Basin," with Lee Ferry as the division point on the river. Lee Ferry, located in Arizona, is a point in the mainstream 1 mile below the mouth of the Paria River. For the purpose of this report, the Great Divide Basin, a closed basin in Wyoming, and the White River in Nevada have not been considered as part of the Colorado River system. Diversions from the system to areas outside its drainage area are considered herein as exports and have not been classified as to types of use.

Beneficial consumptive use is normally construed to mean the consumption of water brought about by human endeavors and in this report includes use of water for municipal, industrial, agricultural, power generation, export, recreation, fish and wildlife, and other purposes, along with the associated losses incidental to these uses.

The storage of water and water in transit may also act as losses on the system although normally such water is recoverable in time. Qualitatively, what constitutes beneficial consumptive use is fairly well understood; however, an inability to exactly quantify these uses has led to various differences of opinion. The practical necessity of administering the various water rights, apportionments, etc., of the Colorado River has led to definitions of consumptive use or depletions generally in terms of "how it shall be measured." The Upper Colorado River Compact provides that the Upper Colorado River Commission is to determine the apportionment made to each State by ". . . the inflow-outflow method in terms of manmade depletions of the virgin flow at Lee Ferry. . . ." There is further provision that the measurement method can be changed by unanimous action of the Commission. In contrast, article 1(A) of the decree of the Supreme Court of the United States in *Arizona* v. *California* defines, for the purpose of the decree, "Consumptive use means diversions from the stream less such return flows thereto as are available for consumptive use in the United States or in satisfaction of the Mexican Treaty obligation." Nearly all the water exported from the Upper Colorado River system is measured; however, the remaining beneficial consumptive use, for the most part, must be estimated using theoretical methods and techniques. In the Lower Colorado River system tributaries to the mainstream, similar methods must be employed to determine the amount of water consumptively used.

Reservoir evaporation loss is a consumptive use associated with the beneficial use of water for other purposes. For the purpose of this report, main stem reservoir evaporation is carried as a separate item for the Upper and Lower Basins.

Channel losses within the system are normally construed to be the consumptive use by riparian vegetation along the stream channel (or conveyance route) and the evaporation from the stream's water surface and wetted materials. Seepage from the stream normally appears again downstream or reaches a ground water aquifer where it may be usable again. A decided lack of data and acceptable methodology along with the intermittent flow characteristics of many Southwest streams combine to make a reasonable determination of channel loss difficult. Channel losses have not been estimated for this report within the Upper Basin nor on the tributaries of the Lower Colorado River mainstream. Channel losses on the mainstream below Lee Ferry have been estimated primarily by the inflow-outflow method..

Methodology and Data Collection

This initial report is based almost entirely on data obtained from ongoing programs and current reports. No new land use surveys were initiated. Available quantitative measurements of water were used wherever their use aided or complemented the determination of consumptive use.

UPPER COLORADO RIVER

Irrigation Consumptive Use: The determination of annual irrigated acreage and crop distribution during the reporting period was made using the 1969 National Census of Agriculture, annual State Agricultural Statistics Reports, Bureau of Reclamation Crop Inventory Reports, and various inventory and planning reports issued by the Upper Basin States. Since most of these data were presented on a county basis, it was necessary to separate them into reporting areas and smaller sub-basins for computational purposes. This was accomplished by using land inventory maps and relationships developed for the comprehensive framework study.

For purposes of computing irrigation consumptive use, the Upper Colorado River Basin was divided into 58 sub-basins to account for local consumptive use requirements. These sub-basins generally follow tributary stream basin and State boundaries. A representative climatic station was selected for each sub-basin. Using historical records of temperature, precipitation, and frost dates, a consumptive use rate was computed for each major crop in each of the reporting years. For the purpose of this report, the consumptive use rates were computed using the modified Blaney-Criddle evapotranspiration formula in the version described in the Soil Conservation Service Technical Release No. 21, "Irrigation Water Requirements," revised September 1970. Irrigation consumptive use rates were determined by subtracting the effective precipitation from the consumptive use rates. Effective precipitation was computed using criteria described in the U.S. Department of Agriculture, Agricultural Research Service, Technical Bulletin No. 1275. The values of irrigation consumptive use rates were applied against the estimates of irrigated acreage to yield the final values of irrigation consumptive use.

The theoretical consumptive use determinations are based on the assumption of full water supply during the crop growing season. However, it is estimated that in an average year about 37 percent of the irrigated lands in the Upper Basin receive less than a full supply of water, either due to lack of distribution facilities or inferior water rights. The degree to which these lands suffer shortages varies widely from year to year, depending in large part on the magnitude of runoff. For this study, an estimate of the short supply service lands was made for each sub-basin, primarily on the basis of reports and investigations collected for the framework study. A streamflow gaging station was selected within each sub-basin and the magnitude of the recessional portion of the hydrograph was used as an index to select the date at which consumptive use calculations should be terminated for the short supply lands.

Comprehensive framework studies of the incidental consumptive use of water associated with irrigation indicated that this use amounted to a magnitude ranging from 5 to 28 percent of the irrigation consumptive use depending upon location of the study area within the Upper Basin. Lacking an up-to-date inventory of incidental use lands, these percentage adjustments were retained for use in this study and applied against the annual estimates of irrigation consumptive uses. The total irrigation consumptive use and incidental consumptive use associated with irrigation are reported in tables UC-3 to UC-7.

Reservoir Evaporation: A comprehensive listing of all reservoirs and stockponds in the Upper Basin was developed. This listing included information about major reservoir use, location, elevation, total capacity, and surface area at total capacity. The listing was brought up to date and is now kept current.

Monthly content records were obtained for those reservoirs for which records are available. The average annual water-surface area was determined for each year of the reporting period. For those reservoirs lacking records, a "fullness factor" was estimated on the basis of reservoir use and historical hydrologic conditions. These "fullness factors" were then used to obtain estimates of average annual water-surface area for the unreported reservoirs.

Regression equations relating gross annual reservoir evaporation to elevation, latitude,

and geographic location were developed for each of the reporting years. Account was taken of precipitation and runoff salvage to determine net evaporation rates. The net evaporation rates were applied against the estimates of average annual water-surface area to yield the values of annual reservoir and stockpond evaporation.

An exception to this procedure was the determination of evaporation from the main stem reservoirs. Predetermined evaporation rates were applied against historical surface areas to yield values of evaporation on a monthly basis.

Exports: Over 99 percent of the water exported from the Upper Basin is gaged and reported on by the Geological Survey or water user organizations. The remainder was estimated on the basis of past records or capacity of facilities.

Thermal Electric Uses: Records of water consumptively used at thermal powerplants were obtained from the power utility companies.

Other Uses: These include livestock usage (excluding stockpond evaporation), municipal, urban, rural, recreation, and industrial (other than thermal powerplant). These items represent only 3 percent of the total Upper Basin use. The values presented in this report were estimated by interpolating between 1965 and 1980 levels of use as reported and estimated in the Comprehensive Framework Study.

LOWER COLORADO RIVER

Mainstream: The annual consumptive use of water from the Colorado River mainstream by the States and exports from the system were taken from the Bureau of Reclamation annual report entitled "Compilation of Records in Accordance with Article V of the Decree of the United States in *Arizona* v. *California*," dated March 9, 1964. To these data were credited unmeasured subsurface return flows below Davis Dam, and surface return flows from Las Vegas Wash. Estimated subsurface return flows were based partly on preliminary information supplied by the Task Force on Ground-Water Return Flows. Return flows through Las Vegas Wash as a result of Lake Mead diversions into Las Vegas Valley were estimated by the same procedures used in the derivation of the 1975 return flow, as shown in the Article V compilation. For the purpose of this report, all unmeasured subsurface return flow was credited to irrigation use and divided between California and Arizona based on their respective irrigated areas. Surface water return flow through Las Vegas Wash was credited to Nevada's municipal and industrial water uses.

Gross evaporation from Lake Mead is estimated by the Geological Survey and published in its annual Water Resource Data reports. Deductions for precipitation on the lake surface were made on the basis of precipitation at Boulder City, Nev. Net evaporation from Lakes Mohave and Havasu and Senator Wash Reservoir were derived from available evaporation and precipitation records and operating data. Since surface-water levels of the remaining small impoundments remain relatively constant throughout the year, an annual allowance of 36,000 acre-feet for evaporative losses was used throughout the report period.

Annual channel losses were estimated as the outflow necessary to balance a simplified budget of inflow and outflow below Davis Dam. Apparent channel losses averaged 280,000 acre-feet annually, using 200,000 acre-feet per year as unmeasured subsurface return flow. Above Davis Dam, an annual channel loss of 100,000 acre-feet was assigned, based in part on information in the Geological Survey Professional Paper 486-D.

Releases from Davis Dam are used throughout this report rather than those from Hoover Dam because of an apparent error in the measurement of Hoover Dam releases. Remedial measures are underway to correct this deficiency.

Tributaries: Records of measured diversions, return flows, and consumptive use comparable to the mainstream are not available in the tributary areas. Although diversion records are kept by a number of water-using entities, return flows are seldom measured. Most return flows are subsurface in nature and are not

amenable to direct measurement. Theoretical and indirect methods of estimating consumptive use must be relied upon in the tributary areas. In the New Mexico portion of the Gila River Basin, the annual consumptive use of water is reported by the New Mexico Interstate Stream Commission, pursuant to article VII of the March 9, 1964, decree of the United States Supreme Court in *Arizona* v. *California, et al.*

Agriculture: About 85 percent of the consumptive use in the tributary area to the Colorado River mainstream is for irrigated agriculture. The annual irrigated acreage and crops grown within each reporting area were estimated principally from information in the yearly State Agriculture Statistics. Irrigated pasture and some minor crops not reported by the statistics were estimated from information in the 1969 Census of Agriculture, supporting information from framework studies, and various other local reports including county farm-agent interviews. In essence, the county data from the statistics were disaggregated into the reporting areas and subareas for computational purposes. The Blaney-Criddle empirical formula was utilized to compute the annual rate of crop consumption use. The formula is based on the assumption of a full water supply, among other things, and results in a theoretical water requirement rather than actual use. Seasonal crop consumptive use factors' "K" for the lower elevation desert areas were selected from Technical Bulletin 169 "Consumptive Use of Water by Crops in Arizona," issued September 1965 by the University of Arizona and the U.S. Department of Agriculture. In the higher areas, seasonal factors from the Soil Conservation Service Technical Release No. 21 were utilized. Effective precipitation, that amount of rainfall which satisfies a portion of consumptive use, is accounted for by criteria developed for this area by Wayne D. Criddle, former Utah State Engineer. Among the many variables affecting the actual use of water, the most important is individual farm water supply and its management. There is no adequate method to adjust computed annual requirements to actual water use over broad areas.

Past studies of the incidental consumptive use of water associated with irrigation (water surfaces and vegetative areas on rights-of-way for canals, laterals, drains, roads, etc.) suggest that this use may be accounted for by adding 10 to 20 percent of the computed crop consumptive use. A factor of 15 percent is used herein to represent this use. In the heavily irrigated central Arizona area of the Gila River Basin, in-transit water may sometimes be considered a depletion. In-transit water is potential ground water recharge which, due to declining water tables, interception by impervious beds (perched water), etc., is presently irrecoverable. Although this water is not truly consumed, it is not available for use. This temporary loss of water has not been included in this report because of the lack of pertinent information to estimate its present magnitude.

Evaporation from Reservoirs, Lakes, and Stockponds: Adequate data are available at most of the major reservoirs in the tributaries to estimate annual lake evaporation. Monthly net evaporation rates were derived from nearby climatic stations recording pan evaporation and precipitation. Stockpond evaporation was taken directly from framework study supporting data which were prepared by the Soil Conservation Service. In addition to major reservoirs and stockponds, there are many other reservoirs about which little information exists. For the most part, these reservoirs are small and are used for a number of joint purposes. Using available listings of these impoundments and other data, a total average surface area and a representative evaporative loss were estimated. No attempt was made to vary these losses or those from stockponds on a year-by-year basis.

Municipal and Industrial: The base for estimating municipal and industrial uses is the urban and rural population within the reporting areas. Preparation of annual population estimates was guided by the 1970 Census, and various State and county statistical reviews and reports which include population esti-

mates for local areas. The 1975 population of the Lower Colorado River system is estimated at about 2.6 million and increasing at an annual rate of nearly 5 percent. A large portion of the population resides within Maricopa and Pima Counties in Arizona, and in Clark County, Nev. Net water use rates for domestic, urban, and rural uses in the various reporting areas were derived from available studies in the metropolitan areas, State Water Plan reports, and appropriate appendices of the Comprehensive Framework Study, Lower Colorado Region.

Mineral Resources: Arizona leads the Nation in the production of copper, producing more than half of the supply. Following in copper production are Utah, New Mexico, Montana, and Nevada. Most of the copper production, however, in Utah, New Mexico, and Nevada is produced outside of the Lower Colorado River system. The net water use for the production of copper represents about 90 percent of the total water use for the production of minerals within the Lower Colorado River system. The net water use for copper and other mineral production, composed principally of the byproducts and coproducts of copper production (gold, silver, molybdenum, lead, zinc) sand and gravel, lime, coal, stone, pumice, and cement, was estimated from available production data and nominal water use rates. A large part of the information used to estimate current water uses by the mineral industry comes from the Bureau of Mines. This information includes preliminary figures of annual gross value and quantities of mineral production by State. Basic data available from the Bureau of Mines include published figures of gross value of mineral production in relation to amount of water consumed and is expressed as gallons consumed per dollar of production. Figures are available for many mineral types mined and produced in Arizona and Nevada. A continued updating of unit price for each mineral in relation to quantity produced is maintained to arrive at current consumptive use figures based on current gallons consumed per dollar of production figures.

Electric Power: The net use of water for the production of thermal electric energy from the tributaries of the Lower Colorado River system was estimated from diversions to powerplants and from information contained in State water plan reports.

Fish and Wildlife: The many multipurpose lakes, stockponds, and impoundments in the tributaries are used extensively for fishing and recreation activities, as well as for preservation of wildlife. Water consumption in the form of evaporation from these facilities has been included as lake evaporation in this report. There is little information concerning the remaining water consumption for fish and wildlife purposes which may occur at fish hatcheries, marshes, and on croplands administered by the United States or various State Fish and Wildlife Agencies. These remaining uses are believed to be relatively small in the tributary areas and have not been included in this report.

Recreation: At many of the lakes, reservoirs, and impoundments, recreation may be one of the important functions or purposes. Other minor water uses for recreation purposes have not been included herein.

Exports: The relatively minor exports of tributary water outside the Lower Colorado River system are measured by the Geological Survey or water-using organizations. Similarly, most of the exports between tributaries or reporting areas are measured. Water used to transport coal from the Black Mesa (Arizona) to the Mohave Steam Plant (Nevada) is estimated from records of coal burned at the plant.

Adequacy of Data

The adequacy of data is judged on the basis for which it is to be used. Methods of estimating consumptive use are normally established by theoretical or indirect approaches. A formula may be dependent on a number of variables. The relationship and achievable accuracy of each variable must be weighed carefully with the results to justify any significant upgrading of data with respect to accuracy and adequacy.

To a degree, this report makes use of the 1965 development year estimates of consumptive use prepared for the Upper and Lower

Colorado Region's Comprehensive Framework Studies. The sources of readily available and published data are essentially the same for both reports. The report relies, in some cases, on the results of special studies prepared for the framework study.

UPPER COLORADO RIVER

Irrigation Consumptive Use: Annual irrigated acreage and cropping patterns are the most important items of data required for a proper determination of consumptive uses and losses in the Upper Colorado River Basin. The annual State agricultural statistics reports of Wyoming, Colorado, and New Mexico provide good estimates of irrigated harvested cropland. (This item of data is not collected or reported on in the Utah statistics report.) These data are presented on a county basis and must be disaggregated into tributary basins. Generally, this does not present too much of a problem except in Wyoming, where county lines and the Colorado River Basin divide are considerably dissimilar. More timely issuance of the reports would be helpful.

The determination of irrigated nonharvested cropland (mostly irrigated pasture lands) is an area of data collection which needs to be considerably strengthened. This item is not reported on in the State statistics reports. The acreage used to develop the estimates of irrigated pasture consumptive use for this study are based very strongly on acreage values reported in the 1969 National Census of Agriculture. Other areas of data collection which need to be improved are (1) the determination of irrigated lands which receive less than a full seasonal supply of irrigation water and improvement of techniques for estimating water use on these lands, and (2) up-to-date inventories of seeped and phreatophyte areas associated with irrigated lands. The present level of climate data acquisition is adequate for the proper application of the evapotranspiration formula.

Reservoir Evaporation: The techniques and data used to compute reservoir evaporation were generally satisfactory. Of course, additional pan evaporation and reservoir content records would strengthen the estimates.

Other Uses: The records of transbasin exports and thermal powerplant uses are excellent. The estimates of municipal and mineral resource uses could be enhanced through the collection of additional diversion and return flow records. However, extensive data acquisition programs for these items do not seem warranted in light of their small magnitude in comparison to the possible error of estimate of the larger water-use items (e.g., irrigation, evaporation).

LOWER COLORADO RIVER

Mainstream: The annual land use, water supply, and water use information being gathered for the operation, maintenance, and administration of the Colorado River mainstream below Lee Ferry is believed to be generally adequate in quantity, quality, and extent. Under more or less constant review, these data are being continually upgraded wherever deficient. Studies and programs are in progress to remedy a lack of data on return flows from mainstream diversions and to correct the apparent inaccuracies of the recorded releases from Hoover Dam.

Tributaries: For the purpose of this report, there are adequate data, for the most part, in the tributary areas of the Lower Colorado River system to make reasonably accurate estimates of the overall beneficial consumptive use of water by the major types of use. Major uses are agriculture, municipal and industrial, and reservoir evaporation. Although most of the data could be enhanced to some extent, upgrading would entail the collection of supplementing data which would be both expensive for fieldwork and instrumentation and for the office work to assimilate these additional data. Whether supplementing data would actually improve the accuracy of the net water use must be carefully weighed, since most theoretical techniques consider only a small fraction of the factors involved.

Agriculture: County information is available in most of the area to aid in the estimation of irrigated crop acreage. In general, these data are adequate although some difficulty is encountered in disaggregating the data into

tributary areas and into smaller subareas for estimating and computational purposes. A sufficient number of climatic stations are operated to obtain the necessary temperature and precipitation information required for the evapotranspiration formula. Research programs in developing techniques for automatically identifying and measuring irrigated acreage through computer manipulation of satellite digital data may ultimately aid in the assessment of cropped acreage. A weak link in estimating the beneficial consumptive use by agriculture over broad areas is in assessing the actual water supply available, its adequacy as a full supply, and its relationship to consumptive use.

Municipal and Industrial: Most of the population residing within the boundaries of the Lower Colorado River system live in metropolitan Phoenix, Tucson, and Las Vegas. These cities and their surrounding environs have the mutual problem of providing an adequate current and future water supply for a growing community in a water-short area. In addition to an almost continuous flow of studies concerning these problems, adequate production and effluent records are usually available to adequately assess water use. Less than 20 percent of the total population is classified as rural having a significantly lesser per capita use of water. In general, the rural population was considered to have a net water use rate of about 30 gallons per capita per day. Consumptive use of water for thermal power generation and the mineral resource industries constitutes about 2.5 percent of the total estimated beneficial consumptive use within the tributary areas. In general, information regarding the annual use of water by the mineral resource industry is inadequate. The increasing trend for recycling and the methods of achieving compliance with quality of water standards are changing. Unit water-quantity requirements for mineral production and processing may have been modified significantly as compared to a decade ago.

Reservoir Evaporation: There are adequate records available to estimate the annual evaporation from the major reservoirs in the tributary areas. Information on the fluctuation of water levels in the smaller reservoirs and stockponds is nearly nonexistent. Evaporation from these smaller impoundments has been estimated on the basis of either "full" or "average" capacity prevailing throughout the year. Monitoring water-surface areas through remote sensing techniques may remedy this condition to some extent.

Beneficial Consumptive Uses and Losses

Summaries of the Colorado River system annual water uses, 1971–75, by States and type of use are shown in tables C–2 through C–6. Water use within the selected reporting areas is discussed below.

UPPER COLORADO RIVER

Summaries of estimated annual consumptive uses and losses in the Upper Colorado River Basin for each of the reporting years, broken down by State, reporting area, and type of use are shown in tables UC–3 through UC–7. Estimated main stem reservoir evaporation is shown in table UC–1.

Agricultural uses accounted for over 60 percent of the total Upper Basin consumptive uses and losses. Irrigated acreage during the 5-year period averaged about 1,470,000 acres, with apparently little variation from year to year. Irrigation consumptive use did, however, show large variations from year to year due to climatic conditions. In 1971 and 1972, precipitation, temperature, and runoff were at or slightly below normal over the Upper Basin as a whole. In 1973, the basin experienced exceptionally large amounts of precipitation along with below-average temperatures. This combination resulted in decreased irrigation needs. Conditions completely reversed in 1974, when near drought conditions prevailed over most of the basin. Irrigation requirements that year were the highest of the 5-year reporting period. A large portion of the irrigation requirement was met with carryover reservoir storage. As table UC–2 shows, major reservoir storage (excluding main stem reservoirs) decreased in 1974 by

about 730,000 acre-feet. In 1975, precipitation and runoff returned to nearly normal. However, cool temperatures during the growing season reduced irrigation demands. Reservoir storage recovered from the previous year's drawdown.

Reservoir evaporation, also primarily affected by climatic conditions, demonstrated a pattern of variation similar to that of irrigation consumptive use.

Transbasin exports, the second largest Upper Basin use, showed the greatest year-by-year variation and also the greatest net increase during the reporting period. In 1971, exports totaled 583,000 acre-feet. In 1975, exports had risen to 815,500 acre-feet primarily due to the opening of the Boustead Tunnel in Colorado and Azotea Tunnel, which outlets in New Mexico.

Thermal power water uses in the Upper Basin more than doubled in the 5-year reporting period as four major powerplants went into operation: San Juan (New Mexico) in 1973; Navajo (Arizona) in 1974; Jim Bridger (Wyoming) in 1974; and Huntington (Utah) in 1975.

During the 5-year reporting period, main stem regulating reservoirs recorded an increase of 9,906,000 acre-feet of surface storage. As storage increased, main stem reservoir evaporation rose from 458,000 acre-feet in 1971 to 607,000 acre-feet in 1975.

LOWER COLORADO RIVER

Water use within the Lower Colorado River system is increasing as a result of additional irrigated acreage and a fast-growing population. Irrigated land has increased from about 1,285,000 acres in 1971 to 1,440,000 acres in 1975. Population in 1970 was estimated to be about 2.1 million, and 2.6 million in 1975.

Mainstream

Table LC–1 shows water-surface evaporation from mainstream reservoirs and channel losses; table LC–2, the change in surface-water contents of the reservoirs; and table LC–3, water uses along the Lower Colorado River mainstream and flood plain including water passing to Mexico. Water passing to Mexico is made up of deliveries in satisfaction of the Treaty, deliveries made pursuant to Minutes 218, 241, and 242, and regulatory waste. Mainstream reservoirs gained about 3.4 million acre-feet of surface storage during the 5-year reporting period. Water supplies necessary to meet the mainstream water use, including reservoir surface and bank storage, came principally from the regulated releases at Glen Canyon Dam.

Annual reservoir evaporation and channel losses consumed about 1.5 million acre-feet. Table LC–9, a water budget below Davis Dam, results in an estimate of the overall channel losses in the reach to the International Boundary. Irrigated land has increased from about 331,000 acres in 1971 to 351,000 acres in 1975—most of the increase occurring in the Colorado River Indian Reservation. Municipal and industrial water use, including thermal powerplants in Nevada and Arizona, doubled during the 5-year period. Much of this demand is within southern Nevada. Pursuant to Minutes 218 and 242, saline return flows from the Wellton-Mohawk Irrigation and Drainage District near Yuma, Ariz., were bypassed around Morelos Dam at the International Boundary resulting in a substantial increase in the water passing to Mexico in excess of the Treaty requirements. Project plans to implement the United States measures required by Minute 242 call for reduction of bypassed water through improved irrigation efficiencies, reduced acreage to be irrigated on Wellton-Mohawk Project lands, and the construction of a desalting plant converting drainage water to an acceptable quality for de-

Water Year	Colorado River at Compact Point, near Lee Ferry, Arizona (MAF)	Estimated Tributary Inflow to Mainstream (MAF)	Total (MAF)
1971	8.61	0.97	9.58
1972	9.33	0.78	10.11
1973	10.14	2.12	12.26
1974	8.28	0.85	9.13
1975	9.27	0.94	10.21
Average 1971-1975	9.13	1.13	10.26

livery to Mexico. The interim deficit of water to the system will be replaced by water savings resulting from the construction of a concrete-lined canal generally parallel to the first 49-mile reach of the existing unlined Coachella Canal. The water saved, estimated at about 132,000 acre-feet annually, will represent a part of California's entitlement. However, until the water saved is required by these users, it can supplement or replace water from storage that has been released to Mexico and not counted as part of the scheduled treaty deliveries. Plans also call for the permanent replacement of reject brine water from the desalting plant.

Tributaries

Tables LC–4 through LC–8 show water uses by selected tributary areas, by States, and by type of use. Onsite consumptive use in 1971 was estimated to be about 3.8 million acre-feet. By 1975, consumptive use was about 4.5 million acre-feet as a result of a substantial increase in both irrigated acreage and population. Over half of the consumptive use is satisfied from ground water overdraft. Irrigated land was estimated to be about 954,000 acres in 1971, and 1,090,000 acres in 1975. Gain in population has been on the magnitude of about 100,000 new residents for each year during the period. Most of the increase in water use, irrigated land, and population has occurred in the Gila River Basin.

Gila River

Consumptive use for the irrigation of crops represents about 85 percent of the total water use in the Gila River Basin. Estimated annual consumptive use per area for the entire basin during the 5-year period averaged about 3.5 acre-feet, varying from less than 1 acre-foot per acre in parts of New Mexico to over 4 acre-feet in the western portion of the basin. Crop consumptive use varied considerably from year to year on the basis of climatic conditions. Favorable economic conditions for farming led to an increase in irrigated land of about 127,000 acres.

The consumptive use of water for municipal and industrial purposes is estimated to have increased about 42,000 acre-feet during the 5-year period.

Water supply conditions were characterized by exceptionally poor runoff in 1971 and 1974, near normal runoff in 1972 and 1975, and the occurrence of a major flood in 1973. In addition to replenishing storage reservoirs in the basin, the 1973 runoff produced an outflow below Painted Rock Dam of 412,700 acre-feet during the water year. About 100,000 acre-feet of the outflow reached the Colorado River mainstream. Estimated diversions during the 5-year period averaged about 5.6 million acre-feet, of which 4.1 million acre-feet were from ground-water pumpage. The recent "Inventory of Resources and Uses, Arizona State Water Plan, Phase I—July 1975," prepared by the Arizona Water Commission and based on 1970 development conditions, estimated annual ground-water overdraft to exceed 1.8 million acre-feet. In general, increased water uses within the basin since 1970 have added to the overdraft. The Central Arizona Project, scheduled for completion in 1985, would divert the remaining portion of the Arizona entitlement of Colorado River water to central Arizona, reducing ground-water pumpage and consequently the overdraft.

Other Tributary Areas

Outside the Gila River Basin, and within the remaining tributary areas to the Colorado River mainstream, water resources are generally limited and their development is less intensive. As shown in tables LC-4 through LC-8, total estimated consumptive use within the area increased from about 437,000 acre-feet in 1971 to 475,000 acre-feet in 1975. A lack of adequate surface-water storage facilities tends to make irrigated acreage subject to fluctuation from year to year based on the variable and somewhat undependable runoff. Localized ground water overdrafts occur in parts of the area. With the exception of Las Vegas Valley, population is predominantly rural. In Las Vegas Valley, municipal and industrial demands are increasing rapidly; however, these demands are being met by increased diversion from Lake Mead, as shown in table LC–3, and reliance on ground-water pumpage is being reduced.

TABLE C-2—Colorado River System Consumptive Uses and Losses Report, P.L. 90-537
Summary of Estimated Water Use by States, Basins, and Types of Use 1971

(1,000 A.F.)

State	Basin	Estimated Beneficial Consumptive Uses and Losses [1]						
		Reservoir Evaporation [2]	Irrigated Agriculture [3]	Municipal and Industrial [4]	Fish and Wildlife, Recreation	Export Outside System	Export Within System	Total
Arizona	Upper	—	6.6	2.9	1.6	—	—	11
	Lower	160.1	4,216.7	334.6	32.8	—	0.5	4,745
	Total	160.1	4,223.3	337.5	34.4	—	0.5	4,756
California	Lower	—	484.8	7.2	—	4,630.0	—	5,122
Colorado	Upper	—	1,236.8	41.3	7.3	415.0	—	1,701
Nevada	Lower	1.1	62.5	66.9	0.8	—	(-0.5)	131
New Mexico	Upper	—	102.6	22.0	0.6	54.4	—	180
	Lower	5.5	19.9	7.5	—	—	—	33
	Total	5.5	122.5	29.5	0.6	54.4	—	213
Utah	Upper	—	596.1	18.0	7.8	107.6	—	729
	Lower	0.7	61.6	1.1	—	1.3	—	65
	Total	0.7	657.7	19.1	7.8	108.9	—	794
Wyoming	Upper	—	307.4	20.1	0.2	6.0	—	334
Other	Upper	458.0	—	—	—	—	—	458
[5]	Lower	1,458.0	—	—	—	1,560.8	—	3,019
	Total	1,916.0	—	—	—	1,560.8	—	3,477
Colorado	Upper	458	2,250	104	18	583	0	3,413
River	Lower	1,625	4,846	417	34	6,193	0	13,115
System	Total	2,083	7,096	521	52	6,776	0	16,528

[1] From tables UC-1, -3 and LC-1, -3, and -4.
[2] In the Upper Basin, reservoir evaporation other than main stem has been assigned to the principal reservoir function.
[3] Includes livestock water use and stockpond evaporation.
[4] Includes water uses for thermal electric power and mineral resources.
[5] Mainstream reservoir evaporation includes estimated channel loss below Lee Ferry. For the purpose of this report water passing to Mexico (not used in basin) is shown as an export.

TABLE C–3—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537
Summary of Estimated Water Use by States, Basins, and Types of Use 1972

(1,000 A.F.)

State	Basin	Estimated Beneficial Consumptive Uses and Losses [1]						
		Reservoir Evaporation [2]	Irrigated Agriculture [3]	Municipal and Industrial [4]	Fish and Wildlife, Recreation	Export Outside System	Export Within System	Total
Arizona	Upper	—	6.9	3.6	1.7	—	—	12
	Lower	153.4	4,483.9	355.9	33.5	—	1.7	5,028
	Total	153.4	4,490.8	359.5	35.2	—	1.7	5,040
California	Lower	—	500.3	7.6	—	4,820.4	—	5,328
Colorado	Upper	—	1,236.8	42.0	6.2	490.5	—	1,775
Nevada	Lower	1.1	68.3	79.4	0.9	—	(−1.7)	148
New Mexico	Upper	—	114.2	27.5	0.7	41.1	—	183
	Lower	5.5	19.2	10.0	—	—	—	35
	Total	5.5	133.4	37.5	0.7	41.1	—	218
Utah	Upper	—	595.3	18.0	8.1	127.2	—	749
	Lower	0.7	71.6	1.2	—	0.6	—	74
	Total	0.7	666.9	19.2	8.1	127.8	—	823
Wyoming	Upper	—	274.8	19.9	0.2	8.7	0	304
Other	Upper	477.0	—	—	—	—	—	477
[5]	Lower	1,442.0	—	—	—	1,600.5	—	3,042
	Total	1,919.0	—	—	—	1,600.5	—	3,519
Colorado	Upper	477	2,228	111	17	667	Q	3,500
River	Lower	1,603	5,143	454	34	6,421	0	13,655
System	Total	2,080	7,371	565	51	7,088	0	17,155

[1] From tables UC–1, –4 and LC–1, –3, and –5.
[2] In Upper Basin, reservoir evaporation other than main stem has been assigned to the principal reservoir function.
[3] Includes livestock water use and stockpond evaporation.
[4] Includes water uses for thermal electric power and mineral resources.
[5] Mainstream reservoir evaporation includes channel loss below Lee Ferry. For the purpose of this report water passing to Mexico (not used in basin) is shown as an export.

TABLE C–4—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537
Summary of Estimated Water Use by States, Basins, and Types of Use 1973

(1,000 A.F.)

State	Basin	Estimated Beneficial Consumptive Uses and Losses [1]						
		Reservoir Evaporation [2]	Irrigated Agriculture [3]	Municipal and Industrial [4]	Fish and Wildlife, Recreation	Export Outside System	Export Within System	Total
Arizona	Upper	—	7.3	3.2	0.9	—	—	11
	Lower	260.8	4,441.3	370.2	42.9	—	1.9	5,117
	Total	260.8	4,448.6	373.4	43.8	—	1.9	5,128
California	Lower	—	483.2	6.8	—	4,578.4	—	5,068
Colorado	Upper	—	1,043.8	43.3	6.0	443.1	—	1,536
Nevada	Lower	1.1	72.5	81.4	0.8	—	(−1.9)	154
New Mexico	Upper	—	116.9	27.3	0.5	174.9	—	320
	Lower	5.7	19.9	11.0	—	—	—	37
	Total	5.7	136.8	38.3	0.5	174.9	—	357
Utah	Upper	—	603.6	18.5	7.1	100.8	—	730
	Lower	0.7	83.0	1.3	—	8.1	—	93
	Total	0.7	686.6	19.8	7.1	108.9	—	823
Wyoming	Upper	—	270.8	23.9	0.2	8.7	—	304
Other	Upper	502.0	—	—	—	—	—	502
[5]	Lower	1,564.0	—	—	—	1,593.7	—	3,158
	Total	2,066.0	—	—	—	1,593.7	—	3,660
Colorado	Upper	502	2,043	116	15	727	0	3,403
River	Lower	1,832	5,100	471	44	6,180	9	13,627
System	Total	2,334	7,143	587	59	6,907	0	17,030

[1] From tables UC–1, –5 and LC–1, –3, and –6.
[2] In Upper Basin, reservoir evaporation other than main stem has been assigned to the principal reservoir function.
[3] Includes livestock water use and stockpond evaporation.
[4] Includes water uses for thermal electric power and mineral resources.
[5] Mainstream reservoir evaporation includes channel loss below Lee Ferry. For the purpose of this report water passing to Mexico (not used in basin) is shown as an export.

TABLE C–5—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537
Summary of Estimated Water Use by States, Basins, and Types of Use 1974

(1,000 A.F.)

State	Basin	Estimated Beneficial Consumptive Uses and Losses [1]						
		Reservoir Evaporation [2]	Irrigated Agriculture [3]	Municipal and Industrial [4]	Fish and Wildlife, Recreation	Export Outside System	Export Within System	Total
Arizona	Upper	—	8.5	9.0	1.7	—	—	19
	Lower	263.2	4,774.2	378.9	26.5	—	2.1	5,445
	Total	263.2	4,782.7	387.9	28.2	—	2.1	5,464
California	Lower	—	500.1	7.0	—	4,968.0	—	5,475
Colorado	Upper	—	1,304.2	42.0	6.8	502.0	—	1,855
Nevada	Lower	1.1	74.5	85.9	0.9	—	(-2.1)	160
New Mexico	Upper	—	119.5	32.0	0.7	47.7	—	200
	Lower	5.6	19.9	11.3	—	—	—	37
	Total	5.6	139.4	43.3	0.7	47.7	—	237
Utah	Upper	—	633.4	18.5	10.3	122.9	—	785
	Lower	0.7	86.5	1.3	—	0.6	—	89
	Total	0.7	719.9	19.8	10.3	123.5	—	874
Wyoming	Upper	—	327.1	27.5	0.2	8.7	—	364
Other	Upper	596.0	—	—	—	—	—	596
[5]	Lower	1,579.0	—	—	—	1,720.5	—	3,300
	Total	2,175.0	—	—	—	1,720.5	—	3,896
Colorado River System	Upper	596	2,393	129	20	681	0	3,819
	Lower	1,850	5,455	484	28	6,689	0	14,506
	Total	2,446	7,848	613	48	7,370	0	18,325

[1] From tables UC–1, –6 and LC–1, –3, and –7.
[2] In Upper Basin, reservoir evaporation other than main stem has been assigned to the principal reservoir function.
[3] Includes livestock water use and stockpond evaporation.
[4] Includes water uses for thermal electric power and mineral resources.
[5] Mainstream reservoir evaporation includes channel loss below Lee Ferry. For the purpose of this report water passing to Mexico (not used in basin) is shown as an export.

TABLE C–6—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537
Summary of Estimated Water Use by States, Basins, and Types of Use 1975

(1,000 A.F.)

State	Basin	Estimated Beneficial Consumptive Uses and Losses [1]						
		Reservoir Evaporation [2]	Irrigated Agriculture [3]	Municipal and Industrial [4]	Fish and Wildlife, Recreation	Export Outside System	Export Within System	Total
Arizona	Upper	—	8.5	15.3	1.4	—	—	25
	Lower	184.7	4,884.3	381.7	36.2	—	2.2	5,489
	Total	184.7	4,892.8	397.0	37.6	—	2.2	5,514
California	Lower	—	469.3	6.5	—	4,461.5	—	4,937
Colorado	Upper	—	1,166.1	42.9	5.8	562.6	—	1,778
Nevada	Lower	1.1	64.8	89.0	0.8	—	(−2.2)	154
New Mexico	Upper	—	115.0	29.7	0.5	145.2	—	290
	Lower	5.5	16.9	9.9	—	—	—	32
	Total	5.5	131.9	39.6	0.5	145.2	—	322
Utah	Upper	—	482.7	23.9	7.4	101.1	—	615
	Lower	0.7	77.5	1.3	—	3.1	—	83
	Total	0.7	460.2	25.2	7.4	104.2	—	698
Wyoming	Upper	—	253.2	31.3	0.2	6.6	—	291
Other	Upper	607.0	—	—	—	—	—	607
[5]	Lower	1,480.0	—	—	—	1,655.6	—	3,136
	Total	2,087.0	—	—	—	1,655.6	—	3,743
Colorado	Upper	607	2,025	143	15	816	0	3,606
River	Lower	1,672	5,513	489	37	6,120	0	13,831
System	Total	2,279	7,538	632	52	6,936	0	17,437

[1] From tables UC-1, -7, and LC-1, -3, and -8.
[2] In Upper Basin, reservoir evaporation other than main stem has been assigned to the principal reservoir function.
[3] Includes livestock water use and stockpond evaporation.
[4] Includes water uses for thermal electric power and mineral resources.
[5] Mainstream reservoir evaporation includes channel loss below Lee Ferry. For the purpose of this report water passing to Mexico (not used in basin) is shown as an export.

TABLE UC–1—Upper Colorado River System
Consumptive Uses and Losses Report, P.L. 90–537
Estimated Main Stem Reservoir Evaporation [1]

Reservoir Evaporation (1,000 A.F.)

Year	Flaming Gorge	Blue Mesa	Morrow Point	Lake Powell	Total
1971	60	6	2	390	458
1972	73	6	2	396	477
1973	75	7	2	418	502
1974	79	6	2	509	596
1975	79	7	2	519	607
Average	73	6	2	447	528

[1] Undistributed by States.

TABLE UC-2—Colorado River System Consumptive Uses and Losses Report, P.L. 90-537 in Upper Basin Change in Contents of Major Reservoirs 1971-75

(1,000 A.F.)

Reporting Area and Reservoir	Usable Capacity	End of Month Contents Sept. 1970	Change in Contents, Water Year 1971	1972	1973	1974	1975	End of Month Contents Sept. 1975
Green River (Wyoming)								
Big Sandy	38	7	12	3	-5	-2	7	22
Eden	7	2	0	1	7	-7	1	4
Fontenelle	344	246	81	15	-6	-21	14	329
	389	255	93	19	-4	-30	22	355
Green River (Utah)								
Huntington North	3	2	1	-1	0	-1	2	3
Joes Valley	50	47	-1	-6	5	-2	7	50
Meeks Cabin	30	0	5	5	6	-6	8	18
Moon Lake	36	4	4	-4	13	-16	14	15
Scofield	66	39	-1	-18	23	-10	11	44
Starvation	152	94	59	-3	3	-94	92	151
Steinaker	33	14	-1	-3	8	-10	10	18
Strawberry	951	164	9	-19	38	17	29	238
	1,321	364	75	-49	96	-122	173	537
Upper Main Stem (Colorado)								
Crawford	13	5	-1	-3	5	-3	3	6
Dillon	251	246	-10	-15	34	-32	15	238
Fruitgrowers	4	2	-1	-1	1	-1	1	1
Green Mountain	147	134	0	-6	1	-19	17	127
Lake Granby	466	425	19	-14	24	-36	3	421
Paonia	18	13	-10	-2	7	-4	2	6
Rifle Gap	11	4	-1	-2	4	-4	3	4
Ruedi	100	100	0	-4	-17	14	2	95
Silver Jack	13	0	9	-4	1	-3	3	6
Taylor Park	106	104	-21	-36	48	-22	18	91
Vega	33	10	-1	-3	4	-6	5	9
Williams Fork	97	76	3	2	-4	-5	2	74
	1,259	1,119	-14	-88	108	-121	74	1,078
San Juan-Colorado (Colorado)								
Jackson Gulch	10	6	-2	-2	4	-4	4	6
Lemon	39	31	-16	-9	15	-17	19	23
Vallecito	126	88	-46	-20	42	-52	52	64
	175	125	-64	-31	61	-73	75	93
San Juan-Colorado (New Mexico)								
Navajo	1,696	1,261	-268	-95	495	-383	384	1,394
Main Stem Regulating Reservoirs								
Blue Mesa	830	810	-278	-21	205	-137	116	695
Morrow Point	116	116	0	0	-1	-3	3	115
Flaming Gorge	3,749	1,791	1,140	535	-285	402	67	3,650
Lake Powell (Surface content)	25,002	12,039	1,570	-1,121	4,796	726	2,192	20,202
Lake Powell (Residual gains & losses) [1]	—	(5,659)	(860)	(247)	(313)	(918)	(941)	(8,938)
	29,697	14,756	2,432	-607	4,715	988	2,378	24,662

[1] Includes bank storage, ungaged inflow, and measurement errors.

TABLE UC–3—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537
Upper Colorado River Basin Estimated Water Use by State, Major Tributary, and Type of Use 1971

(1,000 A.F.)

State	Tributary or Reporting Area	AGRICULTURE			MUNICIPAL AND INDUSTRIAL [1]					FISH & WILDLIFE RECREATION [1]	EXPORT [1]		TOTAL
		Irrigation	Irrigation Reservoir Evaporation	Stockpond Evaporation & Livestock	Total	Mineral Resources	Thermal Electric Power	Other [2]	Total		Outside System	Within System	
Arizona	San Juan-Colo.	2.5	3.0	1.1	6.6	0.0	0.0	2.9	2.9	1.6	—	—	11.1
Colorado	Green River	130.0	2.1	6.1	138.2	4.6	4.9	1.9	11.4	3.7	—	—	153.3
	Upper Main Stem	889.7	20.3	11.1	921.1	11.2	0.3	13.3	24.8	2.7	412.8	142.6	1,494.8
	San Juan-Colo.	164.3	7.9	5.3	177.5	2.1	0.0	3.0	5.1	0.9	2.2	−142.6	52.3
	Total	1,184.0	30.3	22.5	1,236.8	17.9	5.2	18.2	41.3	7.3	415.0	—	1,700.4
New Mexico	San Juan-Colo.	80.9	18.9	2.8	102.6	2.4	15.7	3.9	22.0	0.6	54.4	—	179.6
Utah	Green River	500.4	25.5	4.2	530.1	7.2	1.9	4.2	13.3	6.9	111.8	—	662.1
	Upper Main Stem	9.6	0.1	0.5	10.2	1.4	0.0	0.8	2.2	0.0	—	—	12.4
	San Juan-Colo.	39.2	14.7	1.9	55.8	1.2	0.0	1.3	2.5	0.9	−4.2	—	55.0
	Total	549.2	40.3	6.6	596.1	9.8	1.9	6.3	18.0	7.8	107.6	—	729.5
Wyoming	Green River	275.2	27.2	5.0	307.4	11.1	5.7	3.3	20.1	0.2	6.0	—	333.7
Upper Basin	Green River	905.6	54.8	15.3	975.7	22.9	12.5	9.4	44.8	10.8	117.8	—	1,149.1
	Upper Main Stem	899.3	20.4	11.6	931.3	12.6	0.3	14.1	27.0	2.7	412.8	142.6	1,507.2
	San Juan-Colo.	286.9	44.5	11.1	342.5	5.7	15.7	11.1	32.5	4.0	52.4	−142.6	298.0
	Total	2,091.8	119.7	38.0	2,249.5	41.2	28.5	34.6	104.3	17.5	583.0	—	2,954.3

[1] Includes evaporation from related reservoirs.
[2] Includes urban, rural, and other industrial uses.

TABLE UC–4—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537
Upper Colorado River Basin Estimated Water Use by State, Major Tributary, and Type of Use 1972

(1,000 A.F.)

State	Tributary or Reporting Area	AGRICULTURE				MUNICIPAL AND INDUSTRIAL [1]				FISH & WILDLIFE RECREATION [1]	EXPORT [1]		TOTAL
		Irrigation	Irrigation Reservoir Evaporation	Stockpond Evaporation & Livestock	Total	Mineral Resources	Thermal Electric Power	Other [2]	Total		Outside System	Within System	
Arizona	San Juan-Colo.	2.9	2.9	1.1	6.9	0.0	0.0	3.6	3.6	1.7	—	—	12.2
Colorado	Green River	180.8	1.6	5.1	115.5	4.6	4.9	2.0	11.5	2.8	—	—	129.8
	Upper Main Stem	891.1	18.1	12.0	921.2	11.3	0.3	13.6	25.2	2.5	488.8	128.4	1,558.2
	San Juan-Colo.	187.0	7.5	5.6	200.1	2.2	0.0	3.1	5.3	0.9	1.7	−128.4	87.5
	Total	1,186.9	27.2	22.7	1,236.8	18.1	5.2	18.7	42.0	6.2	490.5	—	1,775.5
New Mexico	San Juan-Colo.	93.3	18.0	2.9	114.2	2.6	20.8	4.1	27.5	0.7	41.1	—	183.5
Utah	Green River	504.0	25.6	4.3	533.9	7.3	1.7	4.3	13.3	7.1	130.6	—	684.9
	Upper Main Stem	8.9	0.1	0.4	9.4	1.4	0.0	0.8	2.2	0.0	—	—	11.6
	San Juan-Colo.	34.4	15.6	2.0	52.0	1.1	0.0	1.4	2.5	1.0	−3.4	—	52.1
	Total	547.3	41.3	6.7	595.3	9.8	1.7	6.5	18.0	8.1	127.2	—	748.6
Wyoming	Green River	238.2	31.7	4.9	274.8	12.0	4.5	3.4	19.9	0.2	8.7	—	303.6
Upper Basin	Green River	851.0	58.9	14.3	924.2	23.9	11.1	9.7	44.7	10.1	139.3	—	1,118.3
	Upper Main Stem	900.0	18.2	12.4	930.6	12.7	0.3	14.4	27.4	2.5	488.8	128.4	1,569.8
	San Juan-Colo.	317.6	44.0	11.6	373.2	5.9	20.8	12.2	38.9	4.3	39.4	−128.4	335.3
	Total	2,068.6	121.1	38.3	2,228.0	42.5	32.2	36.3	111.0	16.9	667.5	—	3,023.4

[1] Includes evaporation from related reservoirs.
[2] Includes urban, rural, and other industrial uses.

TABLE UC–5—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537
Upper Colorado River Basin Estimated Water Use by State, Major Tributary, and Type of Use 1973

(1,000 A.F.)

State	Tributary or Reporting Area	AGRICULTURE				MUNICIPAL AND INDUSTRIAL [1]				FISH & WILDLIFE RECREATION [1]	EXPORT [1]		TOTAL
		Irrigation	Irrigation Reservoir Evaporation	Stockpond Evaporation & Livestock	Total	Mineral Resources	Thermal Electric Power	Other [2]	Total		Outside System	Within System	
Arizona	San Juan-Colo.	4.0	2.4	0.9	7.3	0.0	0.0	3.2	3.2	0.9	—	—	11.4
Colorado	Green River	95.2	1.5	4.9	101.6	4.7	4.9	2.1	11.7	2.6	—	—	115.9
	Upper Main Stem	732.3	19.0	12.5	763.8	11.4	0.8	13.9	26.1	2.7	439.1	106.6	1,329.8
	San Juan-Colo.	169.1	5.6	3.7	178.4	2.2	0.0	3.3	5.5	0.7	4.0	−106.6	90.5
	Total	996.6	26.1	21.1	1,043.8	18.3	5.7	19.3	43.3	6.0	443.1		1,536.2
New Mexico	San Juan-Colo.	87.8	26.8	2.3	116.9	2.7	20.3	4.3	27.3	0.5	174.9	—	319.6
Utah	Green River	502.1	24.1	3.6	529.8	7.3	1.9	4.3	13.5	6.2	106.8	—	656.3
	Upper Main Stem	9.1	0.1	0.4	9.6	1.4	0.0	0.9	2.3	0.0	—	—	11.9
	San Juan-Colo.	48.2	14.4	1.6	64.2	1.2	0.0	1.5	2.7	0.9	−6.0	—	61.8
	Total	559.4	38.6	5.6	603.6	9.9	1.9	6.7	18.5	7.1	100.8	—	730.0
Wyoming	Green River	235.3	30.8	4.7	270.8	12.8	7.6	3.5	23.9	0.2	8.7	—	303.6
Upper Basin	Green River	832.6	56.4	13.2	902.2	24.8	14.4	9.9	49.1	9.0	115.5	—	1,075.8
	Upper Main Stem	741.4	19.1	12.9	773.4	12.8	0.8	14.8	28.4	2.7	439.1	106.6	1,341.7
	San Juan-Colo.	309.1	49.2	8.5	366.8	6.1	20.3	12.3	38.7	3.0	172.9	−106.6	483.3
	Total	1,883.1	124.7	34.6	2,042.4	43.7	35.5	37.0	116.2	14.7	727.5	—	2,900.8

[1] Includes evaporation from related reservoirs.
[2] Includes urban, rural, and other industrial uses.

TABLE UC–6—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537
Upper Colorado River Basin Estimated Water Uses by State, Major Tributary, and Type of Use 1974

(1,000 A.F.)

State	Tributary or Reporting Area	AGRICULTURE			MUNICIPAL AND INDUSTRIAL [1]					FISH & WILDLIFE RECREATION [1]	EXPORT [1]		TOTAL
		Irrigation	Irrigation Reservoir Evaporation	Stockpond Evaporation & Livestock	Total	Mineral Resources	Thermal Electric Power	Other [2]	Total		Outside System	Within System	
Arizona	San Juan-Colo.	4.3	3.0	1.2	8.5	0.0	5.3	3.7	9.0	1.7	—	—	19.2
Colorado	Green River	112.6	1.7	5.6	119.9	4.7	2.9	2.2	9.8	3.1	—	—	132.8
	Upper Main Stem	946.9	20.2	12.9	980.0	11.6	0.8	14.2	26.6	2.8	500.8	119.9	1,627.0
	San Juan-Colo.	191.8	7.6	4.9	204.3	2.2	0.0	3.4	5.6	0.9	1.2	−119.9	95.2
	Total	1,251.3	29.5	23.4	1,304.2	18.5	3.7	19.8	42.0	6.8	502.0	—	1,855.0
New Mexico	San Juan-Colo.	96.5	20.0	3.0	119.5	2.9	24.6	4.5	32.0	0.7	47.7	—	199.9
Utah	Green River	524.5	31.8	4.8	561.1	7.4	1.8	4.3	13.5	9.2	127.0	—	710.8
	Upper Main Stem	9.9	0.1	0.5	10.5	1.4	0.0	0.9	2.3	—	—	—	12.8
	San Juan-Colo.	41.0	18.8	2.0	61.8	1.1	0.0	1.6	2.7	1.1	−4.1	—	61.5
	Total	575.4	50.7	7.3	633.4	9.9	1.8	6.8	18.5	10.3	122.9	—	785.1
Wyoming	Green River	288.5	33.4	5.2	327.1	13.7	10.1	3.7	27.5	0.2	8.7	—	363.5
Upper Basin	Green River	925.6	66.9	15.6	1,008.1	25.8	14.8	10.2	50.8	12.5	135.7	—	1,207.1
	Upper Main Stem	956.8	20.3	13.4	990.5	13.0	0.8	15.1	28.9	2.8	500.8	119.9	1,639.8
	San Juan-Colo.	333.6	49.4	11.1	394.1	6.2	29.9	13.2	49.3	4.4	44.8	−119.9	375.8
	Total	2,216.0	136.6	40.1	2,392.7	45.0	45.5	38.5	129.0	19.7	681.3	—	3,222.7

[1] Includes evaporation from related reservoirs.
[2] Includes urban, rural, and other industrial uses.

TABLE UC–7—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Upper Colorado River Basin
Estimated Water Use by State, Major Tributary, and Type of Use 1975 [3]

(1,000 A.F.)

State	Tributary or Reporting Area	AGRICULTURE			MUNICIPAL AND INDUSTRIAL [1]					FISH & WILDLIFE RECREATION [1]	EXPORT [1]		TOTAL
		Irrigation	Irrigation Reservoir Evaporation	Stockpond Evaporation & Livestock	Total	Mineral Resources	Thermal Electric Power	Other [2]	Total		Out-Side System	With-in System	
Arizona	San Juan-Colo.	5.1	2.5	0.9	8.5	0.0	12.4	2.9	15.3	1.4	—	—	25.2
Colorado	Green River	100.2	1.6	5.2	107.0	4.7	3.2	2.2	10.1	2.8	—	—	119.9
	Upper Main Stem	826.1	16.5	10.7	853.3	11.7	0.8	14.5	27.0	2.3	559.8	120.3	1,556.5
	San Juan-Colo.	196.3	5.7	3.8	205.8	2.2	0.0	3.6	5.8	0.7	2.8	−120.3	101.0
	Total	1,122.6	23.8	19.7	1,166.1	18.6	4.0	20.3	42.9	5.8	562.6	—	1,777.4
New Mexico	San Juan-Colo.	89.0	23.6	2.4	115.0	3.0	21.9	4.8	29.7	0.5	145.2	—	290.4
Utah	Green River	393.8	24.0	4.5	422.3	7.4	7.0	4.4	18.8	6.6	107.2	—	554.9
	Upper Main Stem	8.7	0.1	0.4	9.2	1.4	0.0	0.9	2.3	—	—	—	11.5
	San Juan-Colo.	36.9	12.6	1.7	51.2	1.2	0.0	1.6	2.8	0.8	−6.1	—	48.7
	Total	439.4	36.7	6.6	482.7	10.0	7.0	6.9	23.9	7.4	101.1	—	615.1
Wyoming	Green River	207.1	28.1	4.9	253.2	14.6	12.9	3.8	31.3	0.2	6.6	—	291.3
Upper Basin	Green River	714.2	53.7	14.6	782.5	26.7	23.1	10.4	60.2	9.6	113.8	—	966.1
	Upper Main Stem	834.8	16.6	11.1	862.5	13.1	0.8	15.4	29.3	2.3	559.8	120.3	1,568.0
	San Juan-Colo.	327.3	44.4	8.8	380.5	6.4	34.3	12.9	53.6	3.4	141.9	−120.3	465.3
	Total	1,876.3	114.7	34.5	2,025.5	46.2	58.2	38.7	143.1	15.3	815.5	—	2,999.4

[1] Includes evaporation from related reservoirs.
[2] Includes urban, rural, and other industrial uses.
[3] Provisional.

TABLE LC–1—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Lower Colorado River Basin Colorado River Mainstream Estimated Reservoir Evaporation and Channel Loss [1] 1971–75

(1,000 A.F.)

	Reservoir Evaporation [2]						Channel Loss [3]			
Water Year	Lake Mead	Lake Mohave	Lake Havasu	Senator Wash Reservoir	Other	Total	Assigned Loss, Compact Point to Davis Dam	Apparent Loss, Davis Dam to IB (Table LC–9)	Total	Total Reservoir Evaporation and Channel Loss
1971	739	185	138	2	36	1,100	100	258	358	1,458
1972	724	188	140	2	36	1,090	100	252	352	1,442
1973	800	157	116	2	36	1,111	100	353	453	1,564
1974	813	178	133	2	36	1,162	100	317	417	1,579
1975	814	173	133	2	36	1,158	100	222	322	1,480
Average	778	176	132	2	36	1,124	100	280	380	1,504

[1] Undistributed by States.
[2] Gross evaporation less precipitation on water surface; Lake Mead gross evaporation is from Geological Survey Water Resources Data publications with the exception of 1975 which was estimated. Other impoundments include Palo Verde, Headgate Rock, Imperial, and Laguna diversion dams. These impoundments remain relatively constant throughout the year.
[3] Channel loss above Davis Dam is assigned.

TABLE LC–2—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Lower Colorado River Basin Colorado River Mainstream and Tributaries Change in Contents—Major Reservoirs [1] 1971–75

(1,000 A.F.)

Area and Reservoir	Usable Capacity	End of Month Contents Sept. 1970	Change in Contents, Water Year					End of Month Contents Sept. 1975
			1971	1972	1973	1974	1975	
Colorado River Mainstream								
Lake Mead	27,377	16,769	117	565	2,725	-818	796	20,154
Lake Mohave	1,810	1,376	65	-37	8	-32	5	1,385
Lake Havasu	619	557	17	-10	-2	1	10	573
Senator Wash Reservoir	14	4	7	-5	-3	3	2	8
	29,820	18,706	206	513	2,728	-846	813	22,120
Gila River								
Salt River Project Reservoirs [2]	2,073	1,137	-431	-157	1,053	-597	63	1,068
San Carlos Reservoir	949	21	18	7	611	-376	-140	141
Lake Pleasant	158	79	-21	-28	80	-52	-38	20
Painted Rock Reservoir (Flood Control)	(2,492) 3,180	— 1,237	— -434	— -178	219 1,963	-186 -1,211	-15 -130	18 1,247
Little Colorado River								
Lyman Reservoir	31	12	-9	-1	22	-13	10	21
Blue Ridge Reservoir	15	11	-9	—	5	-5	3	5
	46	23	-18	-1	27	-18	13	26
Bill Williams River								
Alamo Reservoir (Flood Control)	(1,043)	11	—	—	-1	-1	1	10
Lower Colorado River System	33,046	19,977	-246	334	4,717	-2,076	697	23,403

[1] From Geological Survey Water Resources Data publications and Bureau of Reclamation operational records. Does not include bank storage.
[2] Includes Roosevelt, Apache, Canyon, and Saguaro Lakes on Salt River and Horseshoe and Bartlett Reservoirs on Verde River.

TABLE LC–3—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Lower Colorado River Basin
Colorado River Mainstream Water Uses and Exports by States and Mexico [1] 1971–75

(1,000 A.F.)

Water Year	State	Estimated Consumptive Use [1]						Estimated Unmeasured Return Flow [2]	Estimated Consumptive Use Adjusted For Return Flow	Minutes 218, 241, and 242		Water Passing to Mexico	
		Irrigated Agriculture	Municipal and Industrial	Electric Power	Fish, Wildlife and Recreation	Export	Total			Treaty		Regulatory Waste	Total
1971	Nevada	—	39.2	4.2	0.8	—	44.2	10.3	33.9	—	—	—	—
	Arizona	1,259.2	18.8	0.6	32.8	—	1,311.4	130.5	1,180.9	—	—	—	—
	California	554.3	7.2	—	—	4,630.3	5,191.8	69.5	5,122.3	—	—	—	—
		1,813.5	65.2	4.8	33.6	4,630.3	6,547.4	210.3	6,337.1	1,501.1	55.0	4.7	1,560.8
1972	Nevada	—	65.5	10.7	0.9	—	77.1	17.4	59.7	—	—	—	—
	Arizona	1,204.9	21.5	0.8	33.5	—	1,260.7	131.6	1,129.1	—	—	—	—
	California	568.7	7.6	—	—	4,820.4	5,396.7	68.4	5,328.3	—	—	—	—
		1,773.6	94.6	11.5	34.4	4,820.4	6,734.5	217.4	6,517.1	1,515.5	79.4	5.6	1,600.5
1973	Nevada	—	76.6	11.0	0.8	—	88.4	23.0	65.4	—	—	—	—
	Arizona	1,135.1	21.6	0.8	42.9	—	1,200.4	132.4	1,068.0	—	—	—	—
	California	550.8	6.8	—	—	4,578.4	5,136.0	67.6	5,068.4	—	—	—	—
		1,685.9	105.0	11.8	43.7	4,578.4	6,424.8	223.0	6,201.8	1,444.2	119.8	29.7	1,593.7
1974	Nevada	—	85.5	13.0	0.9	—	99.4	22.9	76.5	—	—	—	—
	Arizona	1,265.9	23.4	1.0	26.5	—	1,316.8	131.9	1,184.9	—	—	—	—
	California	568.2	7.0	—	—	4,968.0	5,543.2	68.2	5,475.1	—	—	—	—
		1,834.1	115.9	14.0	27.4	4,968.0	6,959.4	222.9	6,736.5	1,563.0	151.5	6.0	1,720.5
1975	Nevada	—	80.1	14.3	0.8	—	95.2	27.4	67.8	—	—	—	—
	Arizona	1,282.9	20.5	0.9	36.2	—	1,340.5	132.9	1,207.6	—	—	—	—
	California	536.4	6.5	—	—	4,461.5	5,004.4	67.1	4,937.3	—	—	—	—
		1,819.3	107.1	15.2	37.0	4,461.5	6,440.1	227.4	6,212.7	1,429.1	213.5	13.0	1,655.6

[1] From Bureau of Reclamation calendar year reports "Compilation of Records in Accordance with Article V of the Decree of the Supreme Court of the United States in *Arizona v. California* dated March 9, 1964". Exports to California and water passing to Mexico are demands on system water and consumption is outside system.

[2] Decree accounting does not currently account for certain unmeasured return flows to the mainstream from diversions made therefrom. Estimates of unmeasured return flows shown are for the portion of Las Vegas Wash (Nevada) surface water discharge to Lake Mead from diversions into Las Vegas Valley and for subsurface return flows below Davis Dam. Subsurface return flows were credited to Arizona and California on the basis of irrigated acreage.

TABLE LC–4—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Lower Colorado River Basin
Estimated Water Use by State, Major Tributary, and Type of Use [1] 1971

(1,000 A.F.)

State	Tributary or Reporting Area	Reservoir Evaporation	Agriculture			Municipal and Industrial				Export		Total
			Irrigation	Stockpond Evaporation & Livestock	Total	Mineral Resources	Thermal Electric Power	Other [2]	Total	Outside System	Within System	
Arizona	Little Colorado	18.7	52.8	16.7	69.5	0.8	3.1	14.1	18.0	—	10.6	116.8
	Virgin	2.8	3.5	1.0	4.5	—	—	—	—	—	—	7.3
	Bill Williams	3.5	13.2	2.4	15.6	1.5	—	0.4	1.9	—	—	21.0
	Gila	134.0	2,848.0	48.8	2,896.8	56.9	15.3	213.6	285.8	—	(-10.1)	3,306.5
	Remaining Area	1.1	87.2	14.4	101.6	6.1	—	3.4	9.5	—	—	112.2
	Total	160.1	3,004.7	83.3	3,088.0	65.3	18.4	231.5	315.2	—	0.5	3,563.8
Nevada	Muddy	1.1	23.4	0.3	23.7	—	3.5	0.1	3.6	—	—	28.4
	Remaining Area	—	38.3	0.5	38.8	1.5	7.5	55.1	64.1	—	(-34.4) [3]	68.5
	Total	1.1	61.7	0.8	62.5	1.5	11.0	55.2	67.7	—	(-34.4)	96.9
New Mexico	Little Colorado	5.0	6.6	2.9	9.5	1.8	—	2.0	3.8	—	—	18.3
	Gila	0.5	8.6	1.8	10.4	—	—	3.7	3.7	—	—	14.6
	Total	5.5	15.2	4.7	19.9	1.8	—	5.7	7.5	—	—	32.9
Utah	Virgin	0.7	55.1	2.5	57.6	—	—	1.1	1.1	1.3	—	60.7
	Remaining Area	—	3.5	0.5	4.0	—	—	—	—	—	—	4.0
	Total	0.7	58.6	3.0	61.6	—	—	1.1	1.1	1.3	—	64.7
Lower Basin	Little Colorado	23.7	59.4	19.6	79.0	2.6	3.1	16.1	21.8	—	10.6	135.1
	Virgin	3.5	58.6	3.5	62.1	—	—	1.1	1.1	1.3	—	68.0
	Muddy	1.1	23.4	0.3	23.7	—	3.5	0.1	3.6	—	—	28.4
	Bill Williams	3.5	13.2	2.4	15.6	1.5	—	0.4	1.9	—	—	21.0
	Gila	134.5	2,856.6	50.6	2,907.2	56.9	15.3	217.3	289.5	—	(-10.1)	3,321.1
	Remaining Area	1.1	129.0	15.4	144.4	7.6	7.5	58.5	73.6	—	(-34.4)	184.7
	Total	167.4	3,140.2	91.8	3,232.0	68.6	29.4	293.5	391.5	1.3	(−33.9)	3,758.3

[1] Excludes Colorado River mainstream and flood plain. A large portion of the consumptive uses shown herein are satisfied by ground water overdraft.
[2] Includes urban, rural, and other industrial uses.
[3] Includes net export (diversion less return flow) to Nevada from Colorado River mainstream (table LC–3) and from Little Colorado River basin (Arizona) as coal slurry.

TABLE LC–5—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Lower Colorado River Basin
Estimated Water Use by State, Major Tributary, and Type of Use [1] 1972

(1,000 A.F.)

State	Tributary or Reporting Area	Reservoir Evaporation	AGRICULTURE			MUNICIPAL AND INDUSTRIAL [1]				EXPORT [1]		
			Irrigation	Stockpond Evaporation & Livestock	Total	Mineral Resources	Thermal Electric Power	Other [2]	Total	Outside System	Inside System	Total
Arizona	Little Colorado	18.1	59.5	16.8	76.3	2.0	3.1	14.4	19.5	—	19.7	133.6
	Virgin	2.8	3.0	1.0	4.0	—	—	—	—	—	—	6.8
	Bill Williams	3.5	12.9	2.3	15.2	1.6	—	0.5	2.1	—	—	20.8
	Gila	127.9	3,153.4	48.8	3,202.2	63.4	15.3	222.8	301.5	—	(-18.0)	3,613.6
	Remaining Area	1.1	98.4	14.5	112.9	6.8	—	3.7	10.5	—	—	124.5
	Total	153.4	3,327.2	83.4	3,410.6	73.8	18.4	241.4	333.6	—	1.7	3,899.3
Nevada	Muddy	1.1	25.7	0.3	26.0	—	3.5	0.1	3.6	—	—	30.7
	Remaining Area	—	41.8	0.5	42.3	1.6	15.1	60.0	76.7	—	(-61.4) [3]	57.6
	Total	1.1	67.5	0.8	68.3	1.6	18.6	60.1	80.3	—	(-61.4)	88.3
New Mexico	Little Colorado	5.0	6.0	2.9	8.9	2.0	—	2.2	4.2	—	—	18.1
	Gila	0.5	8.5	1.8	10.3	—	—	5.8	5.8	—	—	16.6
	Total	5.5	14.5	4.7	19.2	2.0	—	8.0	10.0	—	—	34.7
Utah	Virgin	0.7	64.0	2.5	66.5	—	—	1.2	1.2	0.6	—	69.0
	Remaining Area	—	4.6	0.5	5.1	—	—	—	—	—	—	5.1
	Total	0.7	68.6	3.0	71.6	—	—	1.2	1.2	0.6	—	74.1
Lower Basin	Little Colorado	23.1	65.5	19.7	85.2	4.0	3.1	16.6	23.7	—	19.7	151.7
	Virgin	3.5	67.0	3.5	70.5	—	3.5	0.1	3.6	—	—	75.8
	Muddy	1.1	25.7	0.3	26.0	—	3.5	0.1	3.6	—	—	30.7
	Bill Williams	3.5	12.9	2.3	15.2	1.6	—	0.5	2.1	—	—	20.8
	Gila	128.4	3,161.9	50.6	3,212.5	63.4	15.3	228.6	307.3	—	(-18.0)	3,630.2
	Remaining Area	1.1	144.8	15.5	160.3	8.4	15.1	63.7	87.2	—	(-61.4)	187.2
	Total	160.7	3,477.8	91.9	3,569.7	77.4	37.0	310.7	425.1	0.6	(-59.7)	4,096.4

[1] Excludes Colorado River mainstream. A large portion of the consumptive uses shown herein are satisfied by ground water overdraft.
[2] Includes urban, rural, and other industrial uses.
[3] Includes net export (diversion less return flow) to Nevada from Colorado River mainstream (table LC–3) and from Little Colorado River basin (Arizona) as coal slurry.

TABLE LC–6—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Lower Colorado River Basin
Estimated Water Use by State, Major Tributary, and Type of Use [1] 1973

(1,000 A.F.)

State	Tributary or Reporting Area	Reservoir Evaporation	Agriculture: Irrigation	Agriculture: Stockpond Evaporation & Livestock	Agriculture: Total	Municipal and Industrial: Mineral Resources	Municipal and Industrial: Thermal Electric Power	Municipal and Industrial: Other [2]	Municipal and Industrial: Total	Export: Outside System	Export: Inside System	Total
Arizona	Little Colorado	19.3	59.1	16.7	75.8	2.3	3.1	14.7	20.1	—	17.6	132.8
	Virgin	2.8	3.1	1.0	4.1	—	—	—	—	—	—	6.9
	Bill Williams	3.2	16.4	2.3	18.7	1.5	—	0.5	2.0	—	—	23.9
	Gila	234.4	3,183.2	50.0	3,233.2	64.8	15.3	234.5	314.6	—	(−15.7)	3,766.5
	Remaining Area	1.1	91.8	15.0	106.8	7.1	—	4.0	11.1	—	—	119.0
	Total	260.8	3,353.6	85.0	3,438.6	75.7	18.4	253.7	347.8	—	1.9	4,049.1
Nevada	Muddy	1.1	28.2	0.3	28.5	—	3.5	0.2	3.7	—	—	33.3
	Remaining Area	—	43.5	0.5	44.0	1.6	15.5	61.4	78.5	—	(−67.3) [3]	55.2
	Total	1.1	71.7	0.8	72.5	1.6	19.0	61.6	82.2	—	(−67.3)	88.5
New Mexico	Little Colorado	5.0	6.1	2.9	9.0	2.0	—	2.3	4.3	—	—	18.3
	Gila	0.7	9.0	1.9	10.9	—	—	6.7	6.7	—	—	18.3
	Total	5.7	15.1	4.8	19.9	2.0	—	9.0	11.0	—	—	36.6
Utah	Virgin	0.7	75.4	2.5	77.9	—	—	1.3	1.3	8.1	—	88.0
	Remaining Area	—	4.6	0.5	5.1	—	—	—	—	—	—	5.1
	Total	0.7	80.0	3.0	83.0	—	—	1.3	1.3	8.1	—	93.1
Lower Basin	Little Colorado	24.3	65.2	19.6	84.8	4.3	3.1	17.0	24.4	—	17.6	151.1
	Virgin	3.5	78.5	3.5	82.0	—	—	1.3	1.3	8.1	—	94.9
	Muddy	1.1	28.2	0.3	28.5	—	3.5	0.2	3.7	—	—	33.3
	Bill Williams	3.2	16.4	2.3	18.7	1.5	—	0.5	2.0	—	—	23.9
	Gila	235.1	3,192.2	51.9	3,244.1	64.8	15.3	241.2	321.3	—	(−15.7)	3,784.8
	Remaining Area	1.1	139.9	16.0	155.9	8.7	15.5	65.4	89.6	—	(−67.3)	179.3
	Total	268.3	3,520.4	93.6	3,614.0	79.3	37.4	325.6	442.3	8.1	(−65.4)	4,267.3

[1] Excludes Colorado River mainstream. A large portion of the consumptive uses shown herein are satisfied by ground water overdraft.
[2] Includes urban, rural, and other industrial uses.
[3] Includes net export (diversion less return flow) to Nevada from Colorado River mainstream (table LC–3) and from Little Colorado River basin (Arizona) as a coal slurry.

TABLE LC–7—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Lower Colorado River Basin
Estimated Water Use by State, Major Tributary, and Type of Use [1] 1974

(1,000 A.F.)

State	Tributary or Reporting Area	Agriculture				Municipal and Industrial				Export		
		Reservoir Evaporation	Irrigation	Stockpond Evaporation & Livestock	Total	Mineral Resources	Thermal Electric Power	Other [2]	Total	Outside System	Inside System	Total
Arizona	Little Colorado	20.9	55.5	16.7	72.2	2.7	3.1	15.0	20.8	—	14.7	128.6
	Virgin	2.8	3.2	1.0	4.2	—	—	—	—	—	—	7.0
	Bill Williams	3.5	13.0	2.4	15.4	1.4	—	0.6	2.0	—	—	20.9
	Gila	234.9	3,368.9	49.6	3,418.5	60.1	15.3	245.6	321.0	—	(−12.6)	3,961.8
	Remaining Area	1.1	114.9	15.0	129.9	6.6	—	4.1	10.7	—	—	141.7
	Total	263.2	3,555.5	84.7	3,640.2	70.8	18.4	265.3	354.5	—	2.1	4,260.0
Nevada	Muddy	1.1	27.8	0.3	28.1	1.5	3.5	0.2	5.2	—	—	34.4
	Remaining Area	—	45.9	0.5	46.4	1.6	17.4	62.6	81.6	—	(−78.6) [3]	49.4
	Total	1.1	73.7	0.8	74.5	3.1	20.9	62.8	86.8	—	(−78.6)	83.8
New Mexico	Little Colorado	5.0	6.0	2.9	8.9	2.2	—	2.3	4.5	—	—	18.4
	Gila	0.6	9.0	2.0	11.0	—	—	6.8	6.8	—	—	18.4
	Total	5.6	15.0	4.9	19.9	2.2	—	9.1	11.3	—	—	36.8
Utah	Virgin	0.7	79.1	2.6	81.7	—	—	1.3	1.3	0.6	—	84.3
	Remaining Area	—	4.3	0.5	4.8	—	—	—	—	—	—	4.8
	Total	0.7	83.4	3.1	86.5	—	—	1.3	1.3	0.6	—	89.1
Lower Basin	Little Colorado	25.9	61.5	19.6	81.1	4.9	3.1	17.3	25.3	—	14.7	147.0
	Virgin	3.5	82.3	3.6	85.9	—	—	1.3	1.3	0.6	—	91.3
	Muddy	1.1	27.8	0.3	28.1	1.5	3.5	0.2	5.2	—	—	34.4
	Bill Williams	3.5	13.0	2.4	15.4	1.4	—	0.6	2.0	—	—	20.9
	Gila	235.5	3,377.9	51.6	3,429.5	60.1	15.3	252.4	327.8	—	(−12.6)	3,980.2
	Remaining Area	1.1	165.1	16.0	181.1	8.2	17.4	66.7	92.3	—	(−78.6)	195.9
	Total	270.6	3,727.6	93.5	3,821.1	76.1	39.3	338.5	453.9	0.6	(−76.5)	4,469.7

[1] Excludes Colorado River mainstream. A large portion of the consumptive uses shown herein are satisfied by ground water overdraft.
[2] Includes urban, rural, and other industrial uses.
[3] Includes net export (diversion less return flow) to Nevada from Colorado River mainstream (table LC–3) and from Little Colorado River basin (Arizona) as coal slurry.

TABLE LC–8—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Lower Colorado River Basin
Estimated Water Use by State, Major Tributary, and Type of Use [1] 1975

(1,000 A.F.)

State	Tributary or Reporting Area	Agriculture				Municipal and Industrial				Export		
		Reservoir Evaporation	Irrigation	Stockpond Evaporation & Livestock	Total	Mineral Resources	Thermal Electric Power	Other [2]	Total	Outside System	Inside System	Total
Arizona	Little Colorado	19.4	50.8	16.9	67.7	2.8	3.1	15.0	20.9	—	20.8	128.8
	Virgin	2.8	3.0	1.0	4.0	—	—	—	—	—	—	6.8
	Bill Williams	3.3	13.8	2.4	16.2	1.4	—	0.6	2.0	—	—	21.5
	Gila	158.1	3,477.3	47.0	3,524.3	54.4	15.3	256.9	326.6	—	(−18.6)	3,990.4
	Remaining Area	1.1	107.5	14.5	122.0	6.5	—	4.4	10.9	—	—	134.0
	Total	184.7	3,652.4	81.8	3,734.2	65.1	18.4	276.9	360.4	—	2.2	4,281.5
Nevada	Muddy	1.1	23.5	0.4	23.9	2.2	3.5	0.2	5.9	—	—	30.9
	Remaining Area	—	40.4	0.5	40.9	1.5	18.8	63.9	90.1	—	(−70.0) [3]	55.1
	Total	1.1	63.9	0.9	64.8	3.7	22.3	64.1	90.1	—	(−70.0)	86.0
New Mexico	Little Colorado	5.0	3.2	2.9	6.1	2.3	—	2.3	4.6	—	—	15.7
	Gila	0.5	8.7	2.0	10.7	—	—	5.4	5.4	—	—	16.6
	Total	5.5	11.9	4.9	16.8	2.3	—	7.7	10.0	—	—	32.3
Utah	Virgin	0.7	70.3	2.6	72.9	—	—	1.3	1.3	3.1	—	78.0
	Remaining Area	—	4.1	0.5	4.6	—	—	—	—	—	—	4.6
	Total	0.7	74.4	3.1	77.5	—	—	1.3	1.3	3.1	—	82.6
Lower Basin	Little Colorado	24.4	54.0	19.8	73.8	5.1	3.1	17.3	25.5	—	20.8	144.5
	Virgin	3.5	73.3	3.6	76.9	—	—	1.3	1.3	3.1	—	84.8
	Muddy	1.1	23.5	0.4	23.9	2.2	3.5	0.2	5.9	—	—	30.9
	Bill Williams	3.3	13.8	2.4	16.2	1.4	—	0.6	2.0	—	—	21.5
	Gila	158.6	3,486.0	49.0	3,535.0	54.4	15.3	262.3	331.9	—	(−18.6)	4,007.0
	Remaining Area	1.1	152.0	15.5	167.5	8.0	18.8	68.3	95.1	—	(−70.0)	193.7
	Total	192.0	3,802.6	90.7	3,893.3	71.1	40.7	350.0	461.7	3.1	(−67.8)	4,482.4

[1] Excludes Colorado River mainstream. A large portion of the consumptive uses shown herein are satisfied by ground water overdraft.
[2] Includes urban, rural, and other industrial uses.
[3] Includes net export (diversion less return flow) to Nevada from Colorado River mainstream (table LC–3) and from Little Colorado River basin (Arizona) as coal slurry.

TABLE LC–9—Colorado River System Consumptive Uses and Losses Report, P.L. 90–537 Lower Colorado River Basin
Colorado River Mainstream Estimated Channel Losses, Davis Dam to International Boundary [1] 1971–75

(1,000 A.F.)

Item	Drainage Area (1,000 sq. mi.)	Water Year 1971		1972		1973		1974		1975		Average 1971–75	
		I	O	I	O	I	O	I	O	I	O	I	O
Colorado River below Davis Dam, Nev.-Ariz.	169.3	8,266		8,453		7,932		8,844		8,179		8,335	
Lake Evaporation, Lake Havasu-Senator Wash Reservoirs-Others (Table LC–1)			176		178		154		171		171		170
Change in Lake Contents, Lake Havasu-Senator Wash (Table LC–2)			24	15		5			4		12		4
Mainstream Consumptive Use and Exports (Table LC–3)													
Nevada [2]			4		11		11		13		14		11
Arizona [3]			1,181	1,129			1,067		1,184		1,207		1,154
California			5,122		5,328		5,068		5,475		4,937		5,186
Mexico			1,561		1,600		1,594		1,720		1,656		1,626
Estimated Tributary Surface water inflow [4]	73.8	60		30		310		40		40		96	
Apparent Channel Losses below Davis Dam [5]			258		252		353		317		222		280
Totals	243.1	8,326	8,326	8,498	4,498	8,247	8,247	8,884	8,884	8,219	8,219	8,431	8,431

[1] Inflow (I) - Outflow (O). Outflow to Mexico (export) is made up of measured discharge of the Colorado River above Morelos Dam and the various wasteways, drains, and canals flowing to the Colorado River between the northerly and southerly international boundaries and at the Arizona-Sonora boundary.
[2] Includes Mohave Powerplant and minor domestic and agricultural water uses.
[3] Table LC-3 less water use for Lake Mead National Recreation Area and Davis Dam and Government Camp.
[4] Subsurface inflow from tributary area and reduction in ground water storage (Yuma Area) is assumed to balance subsurface outflow to Mexico. Estimated surface water inflow includes Bill Williams and Gila Rivers and a remaining area of about 10,710 square miles.
[5] Computed.

APPENDIX XIII - MEXICAN SALINITY PROBLEM

1 F.1 - Mexican Water Treaty (See Appendix I)

1301 - Minute No. 218, March 25, 1965

1302 - Minute No. 241, July 14, 1972

1303 - Minute No. 242, August 30, 1973

1301

MINUTE NO. 218

RECOMMENDATIONS ON THE COLORADO RIVER SALINITY PROBLEM

The Commission met in the office of the Mexican Section in Ciudad Juarez, Chihuahua, at 12:00 m on March 22, 1965, to comply with instructions it has received from the two Governments, to consider measures "to reach a permanent and effective solution" of the problem of the salinity of the waters of the Colorado River which reach Mexico, as contemplated in the Presidential Communiques of March 16 and June 30, 1962 and February 22, 1964.

The Commission reviewed the measures which the two Governments have taken to date to alleviate temporarily the problem of salinity of waters of the lower Colorado River, and noted the reduction which has occurred in the salinity of drainage waters from the Wellton-Mohawk Irrigation and Drainage District and that continued improvement is anticipated.

The Commission, with the scientific and engineering studies made by both Governments as a basis, thereupon adopted the following Resolution, subject to the approval of the two Governments, embodying the following *Recommendations:*

1. That the United States construct at its expense an extension to the present Wellton-Mohawk District's drainage conveyance channel, with capacity of 353 cubic feet (10 cubic meters) per second, along the left bank of the Colorado River to a point below Morelos Dam, and a control structure in that extension of the channel in the reach between Morelos Dam and the mouth of the Araz Drain, which structure would permit the discharge of the Wellton-Mohawk District's drainage waters to the bed of the river at a point either above or below Morelos Dam.

2. That the Commission permit execution of the works which may be required for the extension channel to pass through Morelos Dam.

3. That the extension channel and control structure proposed in Recommendation 1 be operated and maintained by the United States at its expense to discharge all of the Wellton-Mohawk District's drainage waters below Morelos Dam, except those which are discharged above the Dam on the days and at such rates as Mexico may request in writing.

4. That during the life of the present Minute and subject to the reservations of Recommendation 11, the Commission account for Wellton-Mohawk District's drainage waters as a part of those described in the provisions of Article 10 of the Water Treaty of February 3, 1944, with the understanding: a) that on the days for which Mexico requests water at the minimum winter rate of deliveries of 900 cubic feet (25.5 cubic meters) per second, the United States control waters reaching the limitrophe section of the Colorado River so that without including Wellton-Mohawk District's drainage waters, their flows be not less than 800 cubic feet (22.7 cubic meters) per second, their average flow be not less than 900 cubic feet (25.5 cubic meters) per second for the total of such days during each winter period for which the minimum rate is requested, and that the computation of that average flow not take into account flows in excess of 1000 cubic feet (28.3 cubic meters) per second; and b) that the winter periods in reference extend from October 1 of each year through February of the next following year.

5. That throughout the life of this Minute, Mexico schedule water at the minimum rate of deliveries of 900 cubic feet (25.5 cubic meters) per second, for the maximum practical number of days during each winter period, and for not less than 90 days.

6. That the pumping of Wellton-Mohawk District's drainage waters which are to be delivered to Mexico above Morelos Dam be coordinated, insofar as practicable, with Mexico's scheduled deliveries of water at the northerly boundary in order to minimize the salinity of these deliveries; with the understanding that during the period October 1 to February 10 the United States pump at the maximum rate but not to exceed 353 cubic feet per second and, insofar as practicable, from the more saline wells in the District, and also during other periods when the total quantity of the Wellton-Mohawk District's drainage waters is discharged below Morelos Dam.

7. That the United States endeavor to conclude arrangements to permit discontinuance of discharge of waters from the canal wasteways of the Yuma County Water Users' Association to the bed of the Colorado River below Morelos Dam, and if necessary for this purpose, construct and operate, at the expense of the United States, works needed so that such waters be delivered near San Luis, Arizona, and San Luis, Sonora; that Mexico pay for the increased cost of pumping which may be required to discharge these waters to Mexico at the delivery point near San Luis, Arizona, and San Luis, Sonora.

8. That this Minute be in effect during a period of five years, beginning on the date on which the extension to the Wellton-Mohawk District's drainage conveyance channel is placed in operation; and that during this period the Commission review conditions which gave rise to the problem and in due time recommend whether, in keeping with the purpose expressed by both Governments of achieving a permanent and effective solution, a new Minute should be adopted to become effective upon termination of this period.

9. That construction by the United States of works contemplated in this Minute be completed and the works be placed in operation by October 1, 1965, subject to the appropriation of funds by the United States Congress to implement this Minute.

10. That this Minute be specifically approved by both Governments.

11. That the provisions of this Minute not constitute any precedent, recognition, or acceptance affecting the rights of either country, with respect to the Water Treaty of February 3, 1944, and the general principles of law.

The meeting then adjourned.

/s/ J. F. Friedkin
Commissioner of the United States

/s/ D. Herrera J.
Commissioner of Mexico

/s/ Louis F. Blanchard
Secretary of the United States Section

/s/ Fernando Rivas S.
Secretary of the Mexican Section

1302

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

El Paso, Texas,
July 14, 1972.

MINUTE NO. 241

RECOMMENDATIONS TO IMPROVE IMMEDIATELY THE QUALITY OF COLORADO RIVER WATERS GOING TO MEXICO.

The Commission met in the offices of the United States Section, in El Paso, Texas, at 12:00 o'clock noon on July 14, 1972, in accordance with the instructions which the two Governments issued to their respective Commissioners pursuant to the understanding between President Richard Nixon and President Luis Echeverria expressed in their Joint Communique of June 17, 1972, which, with respect to the salinity problem, states:

"Regarding the problem of the salinity of the Colorado River, President Echeverria told President Nixon that Mexico reiterates its position as regards receiving its assignment of original waters from the Colorado River, to which the Treaty of February 3, 1944 refers, and therefore, with the same quality as those derived from Imperial Dam.

"To this, President Nixon replied that this was a highly complex problem that needed careful examination of all aspects. He was impressed by the presentation made by President Echeverria and would study it closely. It was his sincere desire to find a definitive, equitable and just solution to this problem at the earliest possible time because of the importance both nations attach to this matter.

"As a demonstration of this intent and of the goodwill of the United States in this connection, he was prepared to:

(a) undertake certain actions immediately to improve the quality of water going to Mexico;

(Continued on Sheet 2)

COMISION INTERNACIONAL DE LIMITES Y AGUAS
ENTRE MEXICO Y ESTADOS UNIDOS

El Paso, Texas,
14 de julio de 1972.

ACTA NUM. 241.

RECOMENDACIONES PARA MEJORAR INMEDIATAMENTE LA CALIDAD DE LAS AGUAS DEL RIO COLORADO QUE LLEGAN A MEXICO.

La Comisión se reunió en las oficinas de la Sección de los Estados Unidos, en El Paso, Texas, a las 12:00 horas del 14 de julio de 1972, de acuerdo con las instrucciones que los dos Gobiernos dieron a sus respectivos Comisionados en virtud del compromiso contraído por el Presidente Luis Echeverría, y el Presidente Richard Nixon en su Comunicado Conjunto del 17 de junio de 1972, el cual, en relación con el problema de la salinidad, a la letra dice:

"En torno al problema de la salinidad del Río Colorado, el Presidente Echeverría manifestó al Presidente Nixon que México reitera su posición en el sentido de recibir la asignación a que se refiere el Tratado del 3 de febrero de 1944, de aguas originales del Río Colorado, y en consecuencia, con la misma calidad de las que derivan de la Presa Imperial.

A esto, el Presidente Nixon contestó que éste es un problema muy complicado que requiere un minucioso examen de todos sus aspectos. Que estaba impresionado por la exposición hecha por el Presidente Echeverría y que la estudiaría detenidamente. Que era su deseo sincero el encontrar una definitiva, equitativa y justa solución a este problema, a la brevedad posible, por la importancia que ambas naciones dan a este asunto. Que, como una demostración de su propósito y de la buena disposición de Estados Unidos de América en relación a esta materia, estaba dispuesto a:

A) Tomar inmediatamente determinadas medidas para mejorar la calidad de las aguas que vayan a México.

(Continúa en la hoja 2)

(Continued from Sheet 1)

(b) designate a special representative to begin work immediately to find a permanent, definitive and just solution of this problem; ----------

(c) instruct the special representative to submit a report to him by the end of this year; ----------

(d) submit this proposal, once it has the approval of this Government to President Echeverria for his consideration and approval. ----------

"President Echeverria said that he recognized the goodwill of President Nixon and his interest in finding a definitive solution to this problem at the earliest possible time. He added that based on two recent trips to the Mexicali Valley and his talks with farmers there, his Government, while reserving its legal rights, had decided to stop using waters from the Wellton-Mohawk project for irrigation purposes while waiting for receipt of the United States proposal for a definitive solution. ----------

"Both Presidents agreed to instruct their Water and Border Commissioners to prepare and sign a Minute containing the above program and commitments as soon as possible." ----------

The Commission, on the basis of the understandings expressed in the Joint Communique, adopts, subject to the approval of the two Governments, the following --------

RESOLUTION: ----------

1. That, commencing on the date of the approval of the present Minute, the United States take the measures described in points 2 and 3 of this resolution, to improve the quality of the waters of the Colorado River made available to Mexico at the Northerly Boundary, which it is estimated will reduce the salinity of such waters by at least 100 parts per million as an annual mean, ----

(Continued on Sheet 3)

(Continúa de la hoja 1)

B) Designar a un representante especial para comenzar inmediatamente la tarea de encontrar a este problema una solución definitiva, justa y permanente. ----------

C) Impartir instrucciones a este representante especial para que le someta un informe antes de fin de año. ----------

D) Transmitir esta propuesta, una vez que haya sido aprobada por su Gobierno, al Presidente Echeverría para su consideración y aprobación. --------

El Presidente Echeverría manifestó que reconocía la buena disposición del Presidente Nixon y su interés por encontrar una solución definitiva a este problema a la mayor brevedad posible. Añadió que, en vista de sus dos recientes viajes al Valle de Mexicali y en sus pláticas con los campesinos de la región, su Gobierno, reservando sus derechos, había resuelto dejar de utilizar en el riego las aguas de Wellton-Mohawk, en espera de recibir la propuesta de Estados Unidos de América para una solución definitiva. ----------

Ambos Presidentes acordaron instruir a sus Comisionados de Límites y Aguas a fin de que, a la mayor brevedad posible, levanten y suscriban el Acta que contenga el plan y los compromisos arriba mencionados". ----------

La Comisión, basada en los acuerdos expresados en el Comunicado Conjunto, adopta, sujeta a la aprobación de los dos Gobiernos, la siguiente ----------

RESOLUCION: ----------

1. Que, principiando en la fecha de aprobación de la presente Acta, los Estados Unidos tomen las medidas descritas en los apartados 2 y 3 de la presente resolución, para mejorar la calidad de las aguas del Río Colorado que se pongan a disposición de México en el Lindero Norte, las cuales se estima que reducirán la salinidad de dichas aguas cuando menos en cien partes por millón, en -

(Continúa en la hoja 3)

(Continued from Sheet 2)

compared with the mean annual salinity of the waters made available to Mexico at the Northerly Boundary in calendar year 1971, under Minute No. 218; such improvement to be independent of the improvement in quality which may be achieved by discharging to the Colorado River below Morelos Dam the part of the drainage waters from the Wellton-Mohawk District described in point 5 of this resolution.

2. That the United States continue to operate and maintain, at its expense, the extension of the Wellton-Mohawk District's drainage water conveyance channel and its control structures, constructed pursuant to Recommendation 1 of Minute No. 218.

3. That, commencing on the date of approval of the present Minute, the United States discharge to the Colorado River downstream from Morelos Dam volumes of drainage waters from the Wellton-Mohawk District at the annual rate of 118,000 acre-feet (145,551,000 cubic meters) and substitute therefor equal volumes of other waters, to be discharged to the Colorado River above Morelos Dam, with the understanding that during the second six months of 1972, the United States discharge the volume of 73,000 acre-feet (90,044,000 cubic meters) of drainage waters from the Wellton-Mohawk District downstream from Morelos Dam and substitute therefor an equal volume of other waters to be discharged above Morelos Dam.

4. That Mexico's requests for deliveries in the limitrophe reach of the Colorado River be not less than 900 cubic feet (25.5 cubic meters) per second, excluding the flows charged as part of Mexico's allotment under the Water Treaty of February 3, 1944, in accordance with Minute No. 240, for emergency deliveries to the City of Tijuana.

(Continued on Sheet 4)

(Continúa de la hoja 2)

promedio anual, en comparación con la salinidad media anual de las aguas que se pusieron a disposición de México, en el Lindero Norte, en el año civil de 1971, de conformidad con el Acta Núm. 218; esa mejoría será independiente de la mejoría de la calidad que se logre descargando al Río Colorado, aguas abajo de la Presa Morelos, la parte de las aguas de drenaje del Distrito de Wellton-Mohawk a que se refiere el apartado 5 de la presente resolución.

2. Que los Estados Unidos continúen operando y manteniendo, a sus expensas, la prolongación del canal de conducción de las aguas de drenaje del Distrito de Wellton-Mohawk y sus estructuras de control, construidas de conformidad con la Recomendación 1 del Acta Núm. 218.

3. Que, principiando en la fecha de aprobación de la presente Acta, los Estados Unidos descarguen al Río Colorado, aguas abajo de la Presa Morelos, volúmenes de las aguas de drenaje del Distrito de Wellton-Mohawk a razón de 145,551,000 metros cúbicos (118,000 acres-pies) anuales y los sustituyan con volúmenes iguales de otras aguas, que serán descargados al Río Colorado, aguas arriba de la Presa Morelos; entendido que durante el segundo semestre de 1972 los Estados Unidos descargarán un volumen de 90,044,000 metros cúbicos (73,000 acres-pies) de las aguas de drenaje del Distrito de Wellton-Mohawk, aguas abajo de la Presa Morelos, y lo sustituirán con un volumen igual de otras aguas que se descargará aguas arriba de la Presa Morelos.

4. Que los pedidos de agua de México en el tramo limítrofe del Río Colorado no sean menores de 25.5 metros cúbicos (900 pies cúbicos) por segundo, excluyendo los gastos que se carguen al volumen asignado a México por el Tratado de Aguas del 3 de febrero de 1944, de conformidad con el Acta Núm. 240, para las entregas de emergencia a la ciudad de Tijuana.

(Continúa en la hoja 4)

(Continued from Sheet 3)

5. That, pursuant to the decision of President Echeverria, expressed in the Joint Communique, the United States discharge to the Colorado River downstream from Morelos Dam, the remaining volume of drainage waters of the Wellton-Mohawk District, which do not form part of the volume of the drainage waters referred to in point 3 of this resolution, with the understanding that this remaining volume will not be replaced by substitution waters.

6. That, subject to the reservations of point 9 of this resolution, the Commission account for the drainage waters of the Wellton-Mohawk District referred to in points 3 and 5 of this resolution as a part of those described in the provisions of Article 10 of the Water Treaty of February 3, 1944.

7. That the present Minute remain in effect until December 31, 1972.

8. That the present Minute be expressly approved by both Governments and enter into force upon such approval.

9. That the provisions of the present Minute not constitute any precedent, recognition or acceptance affecting the rights of either country with respect to the Water Treaty of February 3, 1944, and the general principles of law.

10. That the life of Minute No. 218 of the International Boundary and Water Commission, as extended by exchange of notes dated November 15, 1971, terminate on the date that

(Continued on Sheet 5)

(Continúa de la hoja 3)

5. Que, de conformidad con la decisión del Presidente Echeverría, expresada en el Comunicado Conjunto, los Estados Unidos descarguen al Río Colorado, aguas abajo de la Presa Morelos, el volumen restante de las aguas de drenaje del Distrito de Wellton-Mohawk, el cual no forma parte del volumen de las aguas de drenaje a que se refiere el apartado 3 de la presente resolución; entendido que ese volumen restante no sería reemplazado por otras aguas de sustitución.

6. Que, bajo las reservas del apartado 9 de la presente resolución, la Comisión contabilice las aguas de drenaje del Distrito de Wellton-Mohawk a que se refieren los apartados 3 y 5 de la presente resolución como parte de las que se describen en las estipulaciones del Artículo 10 del Tratado de Aguas del 3 de febrero de 1944.

7. Que la presente Acta permanezca en vigor hasta el 31 de diciembre de 1972.

8. Que la presente Acta sea expresamente aprobada por ambos Gobiernos y entre en vigor al ser aprobada por ellos.

9. Que las estipulaciones de la presente Acta no constituyan precedente, reconocimiento ni aceptación que afecte los derechos de uno u otro país por cuanto respecta al Tratado de Aguas del 3 de febrero de 1944 y a los principios generales de derecho.

10. Que la vigencia del Acta Núm. 218 de la Comisión Internacional de Límites y Aguas, prorrogada por intercambio de notas fechadas el 15 de noviembre de 1971, concluya

(Continúa en la hoja 5)

(Continued from Sheet 4)

the present Minute enters into ---- force. ----------

The meeting adjourned. ----------

Commissioner of the United States

Commissioner of Mexico

Acting Secretary of the United States Section

Secretary of the Mexican Section

(Continúa de la hoja 4)

en la fecha en que la presente Acta entre en vigor. ----------

Se levantó la sesión. ----------

Comisionado de México

Comisionado de los Estados Unidos

Secretario de la Sección de México

Secretario en Funciones de la Sección de los Estados Unidos

1303

English Text of Minute 242

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

Mexico, D.F.
August 30, 1973

MINUTE NO. 242

PERMANENT AND DEFINITIVE SOLUTION TO THE
INTERNATIONAL PROBLEM OF THE SALINITY OF THE COLORADO RIVER

The Commission met at the Secretariat of Foreign Relations, at Mexico, D.F., at 5:00 p.m. on August 30, 1973, pursuant to the instructions received by the two Commissioners from their respective Governments, in order to incorporate in a Minute of the Commission the joint recommendations which were made to their respective Presidents by the Special Representative of President Richard Nixon, Ambassador Herbert Brownell, and the Secretary of Foreign Relations of Mexico, Lic. Emilio O. Rabasa, and which have been approved by the Presidents, for a permanent and definitive solution of the international problem of the salinity of the Colorado River, resulting from the negotiations which they, and their technical and juridical advisers, held in June, July and August of 1973, in compliance with the references to this matter contained in the Joint Communique of Presidents Richard Nixon and Luis Echeverria of June 17, 1972.

Accordingly, the Commission submits for the approval of the two Governments the following

RESOLUTION:

1. Referring to the annual volume of Colorado River waters guaranteed to Mexico under the Treaty of 1944, of 1,500,000 acre-feet (1,850,234,000 cubic meters):

a) The United States shall adopt measures to assure that not earlier than January 1, 1974, and no later than July 1, 1974, the approximately 1,360,000 acre-feet (1,677,545,000 cubic meters) delivered to Mexico upstream of Morelos Dam, have an annual average salinity of no more than 115 p.p.m. ± 30 p.p.m. U.S. count (121 p.p.m. ± 30 p.p.m. Mexican count) over the annual average salinity of Colorado River waters which arrive at Imperial Dam, with the understanding that any waters that may be delivered to Mexico under the Treaty of 1944 by means of the All American Canal shall be considered as having been delivered upstream of Morelos Dam for the purpose of computing this salinity.

b) The United States will continue to deliver to Mexico on the land boundary at San Luis and in the limitrophe section of the Colorado River downstream from Morelos Dam approximately 140,000 acre-feet (172,689,000 cubic meters) annually with a salinity substantially the same as that of the waters customarily delivered there.

c) Any decrease in deliveries under point 1(b) will be made up by an equal increase in deliveries under point 1(a).

d) Any other substantial changes in the aforementioned volumes of water at the stated locations must be agreed to by the Commission.

e) Implementation of the measures referred to in point 1(a) above is subject to the requirement in point 10 of the authorization of the necessary works.

2. The life of Minute No. 241 shall be terminated upon approval of the present Minute. From September 1, 1973, until the provisions of point 1(a) become effective, the United States shall discharge to the Colorado River downstream from Morelos Dam volumes of drainage waters from the Wellton-Mohawk District at the annual rate of 118,000 acre-feet (145,551,000 cubic meters) and substitute therefor an equal volume of other waters to be discharged to the Colorado River above Morelos Dam; and, pursuant to the decision of President Echeverria expressed in the Joint Communique of June 17, 1972, the United States shall discharge to the Colorado River downstream from Morelos Dam the drainage waters of the Wellton-Mohawk District that do not form a part of the volumes of drainage waters referred to above, with the understanding that this remaining volume will not be replaced by substitution waters. The Commission shall continue to account for the drainage waters discharged below Morelos Dam as part of those described in the provisions of Article 10 of the Water Treaty of February 3, 1944.

3. As a part of the measures referred to in point 1(a), the United States shall extend in its territory the concrete-lined Wellton-Mohawk bypass drain from Morelos Dam to the Arizona-Sonora international boundary, and operate and maintain the portions of the Wellton-Mohawk bypass drain located in the United States.

4. To complete the drain referred to in point 3, Mexico, through the Commission and at the expense of the United States, shall construct, operate and maintain an extension of the concrete-lined bypass drain from the Arizona-Sonora international boundary to the Santa Clara Slough of a capacity of 353 cubic feet (10 cubic meters) per second. Mexico shall permit the United States to discharge through this drain to the Santa Clara Slough all or a portion of the Wellton-Mohawk drainage waters, the volumes of brine from such desalting operations in the United States as are carried out to implement the Resolution of this Minute, and any other volumes of brine which Mexico may agree to accept. It is understood that no radioactive material or nuclear wastes shall be discharged through this drain, and that the United States shall acquire no right to navigation, servitude or easement by reason of the existence of the drain, nor other legal rights, except as expressly provided in this point.

5. Pending the conclusion by the Governments of the United States and Mexico of a comprehensive agreement on groundwater in the border areas, each country shall limit pumping of groundwaters in its territory within five miles (eight kilometers) of the Arizona-Sonora boundary near San Luis to 160,000 acre-feet (197,358,000 cubic meters) annually.

6. With the objective of avoiding future problems, the United States and Mexico shall consult with each other prior to undertaking any new development of either the surface or the groundwater resources, or undertaking substantial modifications of present developments, in its own territory in the border area that might adversely affect the other country.

7. The United States will support efforts by Mexico to obtain appropriate financing on favorable terms for the improvement and rehabilitation of the Mexicali Valley. The United States will also provide non-reimbursable assistance on a basis mutually acceptable to both countries exclusively for those aspects of the Mexican rehabilitation program of the Mexicali Valley relating to the salinity problem, including tile drainage. In order to comply with the above-mentioned purposes, both countries will undertake negotiations as soon as possible.

8. The United States and Mexico shall recognize the undertakings and understandings contained in this Resolution as constituting the permanent and definitive solution of the salinity problem referred to in the Joint Communique of President Richard Nixon and President Luis Echeverria dated June 17, 1972.

9. The measures required to implement this Resolution shall be undertaken and completed at the earliest practical date.

10. This Minute is subject to the express approval of both Governments by exchange of Notes. It shall enter into force upon such approval; provided, however, that the provisions which are dependent for their implementation on the construction of works or on other measures which require expenditure of funds by the United States, shall become effective upon the notification by the United States to Mexico of the authorization by the United States Congress of said funds, which will be sought promptly.

Thereupon, the meeting adjourned.

(signed) J. F. Friedkin
Commissioner of the United States

(signed) D. Herrera J.
Commissioner of Mexico

(signed) F. H. Sacksteder, Jr.
Secretary of the United States Section

(signed) Fernando Rivas S.
Secretary of the Mexican Section

APPENDIX XIV - COLORADO RIVER BASIN SALINITY CONTROL ACT

1401 - H.R.12834 (Administration Bill)

1402 - H.R.12165 (House Committee Bill)

1403 - Colorado River Basin Salinity Control Act, June 24, 1974 (Public Law 93-320, 88 Stat. 266)

1401

93D CONGRESS
2D SESSION

H.R. 12834

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 14, 1974

Mr. HALEY (by request) introduced the following bill; which was referred to the Committee on Interior and Insular Affairs

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A BILL

To authorize the measures necessary to carry out the provisions of minute numbered 242 of the International Boundary and Water Commission, concluded pursuant to the Water Treaty of 1944 with Mexico (TIAS 994), entitled "Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River."

Whereas minute numbered 242 has been concluded under the authority of the Water Treaty of 1944; and

Whereas the United States Section, International Boundary and Water Commission, is the United States agency designated in the Water Treaty of 1944 to undertake the works necessary on the part of the United States to implement the treaty, or other agreements in force between the two governments dealing with boundaries and boundary waters; and

Whereas the measures necessary to implement minute numbered 242 include a desalting complex that extends on both sides of the boundary between the United States and Mexico in addition to works located wholly within the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of State is authorized, through the Commissioner of the United States Section, International Boundary and Water Commission, who shall consult with the Secretary of the Interior and may delegate such authority to the Secretaries of Agriculture, the Army, and the Interior, and the Administrator of the Environmental Protection Agency, to:

(a) Construct, operate, and maintain a desalting complex, including a desalting plant within the boundaries of the United States and a bypass drain for the discharge of the reject stream from the plant and other Wellton-Mohawk drain water to the Santa Clara Slough in Mexico, with the part in Mexico to be constructed by the appropriate agencies of the Government of Mexico with funds transferred through the Commission.

(b) Accelerate cooperative management programs with the Wellton-Mohawk Irrigation and Drainage District for the purpose of reducing saline drainage flows by improving irrigation efficiency. The district shall pay for its share of the costs of such cooperative programs.

(c) Acquire to the extent determined by him to be necessary, lands or interest in lands within the Wellton-Mohawk division, Gila project, to reduce the seventy-five thousand irrigable acres authorized by

the Act of July 30, 1947 (61 Stat. 628), known as the Gila River Reauthorization Act, and to dispose of or use such lands or interests therein on terms consistent with the objective of this Act. The initial reduction in irrigable acreage shall be limited to approximately ten thousand acres: *Provided*, That additional acreage may be acquired, as may be deemed appropriate for the purpose of meeting the obligations of minute numbered 242.

(d) Assist water users in the Wellton-Mohawk Irrigation and Drainage District in installing onfarm systems, as a means of reducing saline drainage flows through improved irrigation efficiencies.

(e) In consideration of the purchase of irrigable lands and the associated increased cost of operation and maintenance of the irrigation system of the Wellton-Mohawk Irrigation and Drainage District, appropriately reduce repayment obligations of the district to the United States under existing contracts.

(f) Contract with the Coachella Valley County Water District to provide for reimbursement by the United States for its use of the water saved through the rehabilitation and betterment of the Coachella Canal as a temporary source of water for meeting the obligations of minute numbered 242.

(g) In consideration of capacity to be relinquished in the All-American and Coachella Canals as a result of the rehabilitation and betterment of the Coachella Canal, appropriately reduce repayment obligations of the Imperial Irrigation District to the United States under existing contracts.

(h) For purposes of the rehabilitation and betterment of the Coachella Canal, acquire to the extent determined by him to be necessary lands or interest in lands within the Imperial Irrigation District on the East Imperial Mesa which receive, or which have been granted rights to receive, water from Imperial Irrigation District's capacity in the Coachella Canal and to dispose of or use such lands or interests therein on terms consistent with the obligations of minute numbered 242. The costs associated with acquiring such lands or interests in such lands shall be included in the total cost of the rehabilitation and betterment of the Coachella Canal.

(i) Acquire on behalf of the United States such lands or interest in lands in the Painted Rock Reservoir as may be necessary to operate the project in accordance with the obligations of minute numbered 242.

SEC. 2. The projects authorized herein shall be designed and operated separately or in combination with the objective of carrying out the purpose of this Act at the least overall cost to the United States. Unless otherwise herein specified, all costs associated with carrying out the provisions of this Act shall be borne by the United States: *Provided*, That nothing in section 1(d) of this Act will relieve water users of costs required to be incurred for complying with the Federal Water Pollution Control Act, as amended.

SEC. 3. Replacement of the reject stream from the desalting plant, and of any Wellton-Mohawk drainage water resulting from essential operations, bypassed to the Santa Clara Slough, except at such times when there exist surplus waters of the Colorado River under the terms of the 1944 Water Treaty, is recognized as a national obligation as provided in section 202 of the Colorado River Basin Project Act. Studies to identify feasible measures to provide adequate replacement water shall be completed not later than June 30, 1980. Replacement of the reject stream bypassed to the Santa Clara Slough shall begin on the date such augmentation of the Colorado River occurs.

SEC. 4. There are hereby authorized to be appropriated to the Secretary of State for the use of the United States Commissioner, International Boundary and Water Commission, such funds as may be necessary to carry out this Act.

SEC. 5. This Act may be cited as the "International Salinity Control Project, Colorado River".

1402

93D CONGRESS
2D SESSION

H.R. 12165

IN THE HOUSE OF REPRESENTATIVES

JANUARY 21, 1974

Mr. JOHNSON of California (for himself, Mr. HOSMER, Mr. RONCALIO of Wyoming, Mr. RUNNELS, Mr. LUJAN, Mr. UDALL, Mr. DON H. CLAUSEN, Mr. KETCHUM, Mr. TOWELL of Nevada, Mr. OWENS, Mrs. BURKE of California, and Mr. STEIGER of Arizona) introduced the following bill; which was referred to the Committee on Interior and Insular Affairs

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A BILL

To authorize the construction, operation, and maintenance of certain works in the Colorado River Basin to control the salinity of water delivered to users in the United States and Mexico.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Colorado River Basin Salinity Control Act".

TITLE I—PROGRAMS DOWNSTREAM FROM IMPERIAL DAM

SEC. 101. (a) The Secretary of the Interior, hereinafter referred to as the "Secretary", is authorized and directed to proceed with a program of works of improvement for the enhancement and protection of the quality of water available in the Colorado River for use in the United States and the Republic of Mexico, in accordance with the provisions of this Act.

(b)(1) The Secretary is authorized to construct, operate, and maintain a desalting complex, including (1) a desalting plant to reduce the salinity of drain water from the Wellton-Mohawk division of the Gila project, Arizona (hereinafter referred to as the division), including a pretreatment plant for settling and filtration of the drain water to be desalted; (2) the necessary appurtenant works including the intake pumping plant system, product waterline, power transmission facilities, and permanent operating facilities; (3) the necessary extension of the existing bypass drain to carry the reject stream from the desalting plant and other drainage waters to the Santa Clara Slough in Mexico, subject to arrangements made pursuant to section 101(c); (4) replacement of the metal flume in the existing main outlet drain extension with a concrete siphon; (5) reduction of irrigation return flows through acquisition of lands to reduce the size of the division, and irrigation efficiency improvements to limit return flows; (6) regulation of Gila River floodwaters entering the division, including possible acquisition of private lands above Painted Rock Dam in Arizona; and (7) all associated facilities including roads, railroad spur, and transmission lines.

(2) The desalting plant shall be designed to reduce the salinity of approximately one hundred and twenty-nine million gallons a day of drain water by a membrane process using advanced technology commercially available. The plant shall effect recovery initially of not less than 70 per centum of the drain water as product

water, and shall effect reduction of not less than 90 per centum of the dissolved solids in the feed water. The Secretary shall use sources of electric power supply for the desalting complex that will not diminish the supply power to preference customers from Federal power systems operated by the Secretary. All costs associated with the desalting plant shall be nonreimbursable.

(c) Replacement of the reject stream from the desalting plant and other drainage waters bypassed to the Santa Clara Slough, at such times as surplus deliveries would not otherwise be made to Mexico, is recognized as a national obligation. The Secretary shall conduct studies to be completed not later than June 30, 1980, providing for adequate replacement water.

(d) The Secretary is hereby authorized to advance funds to the United States section, International Boundary and Water Commission (IBWC), for construction, operation, and maintenance by Mexico pursuant to minute numbered 242 to the Mexico Water Treaty of February 3, 1944, of that portion of the bypass drain within Mexico. Such funds shall be transferred to an appropriate Mexican agency, under arrangements to be concluded by the IBWC providing for the construction, operation, and maintenance of such facility by Mexico.

(e) Any desalted water not needed for the purposes of this Act may be disposed of at prices and under terms and conditions satisfactory to the Secretary and the proceeds therefrom shall be deposited in the General Fund of the Treasury.

(f) For the purpose of reducing the return flows from the division to one hundred and seventy-five thousand acre-feet or less annually, the Secretary is authorized to:

(1) Accelerate the cooperative program of Irrigation Management Services with the Wellton-Mohawk irrigation and drainage district, hereinafter referred to as the district, for the purpose of improving irrigation efficiency. The district shall bear its share of the cost of such program as determined by the Secretary.

(2) Acquire, by purchase or through eminent domain or exchange, to the extent determined by him to be appropriate, lands or interests in lands to reduce the existing seventy-five thousand irrigable acres authorized by the Act of July 30, 1947, (61 Stat. 628) known as the Gila Reauthorization Act. The initial reduction in irrigable acreage shall be limited to approximately ten thousand acres. If the Secretary determines that the irrigable acreage of the division must be reduced below sixty-five thousand acres of irrigable lands to carry out the purpose of this section, the Secretary is authorized to acquire additional developed irrigable lands, as may be deemed by him to be appropriate.

(g) The Secretary is authorized to dispose of the acquired lands and interests therein on terms and conditions satisfactory to him and meeting the objective of this Act or to retain such lands for fish, wildlife, or other appropriate purposes.

(h) The Secretary is authorized, either in conjunction with or in lieu of land acquisition, to assist water users in the division in installing system improvements, such as ditch lining, change of field layouts, automatic equipment, sprinkler systems, and bubbler systems, as a means of increasing irrigation efficiencies: *Provided, however*, That all costs associated with the improvements authorized herein and allocated to the water users on the basis of benefits received, as determined by the Secretary, shall be reimbursed to the United States in amounts and on terms and conditions satisfactory to the Secretary. All costs associated with improvements that will enable water users to meet applicable water quality requirements of State and Federal law shall be the responsibility of the water users under financial criteria established by law.

(i) The Secretary is authorized to amend the contract between the United States and the district dated March 4, 1952, as amended, to provide that—

(1) the portion of the existing repayment obligation owing to the United States allocable to irrigable acreage eliminated from the division for the purposes of this Act, as determined by the Secretary, shall be nonreimbursable; and

(2) if deemed appropriate by the Secretary, the district shall be given credit against its outstanding repayment obligation to offset any increase in operation and maintenance assessments per acre which may result from the district's decreased operation and maintenance base, all as determined by the Secretary.

(j) The Act of July 30, 1947 (61 Stat. 628), is hereby amended to reduce the authorized irrigable acreage of the division as provided in section 201 (e) herein.

(k) The Secretary is authorized to acquire through the Corps of Engineers fee title to, or other necessary interests in, additional lands above the Painted Rock Dam in Arizona that are required for the temporary storage capacity needed to permit operation of the dam and reservoir in times of serious flooding. The Secretary is also authorized, in conjunction with the Corps of Engineers, to adopt other control measures below the dam to permit the United States to comply with its obligations under minute numbered 242. No funds shall be expended for acquisition of land or interests therein until it is finally determined by a Federal court of competent jurisdiction that the Corps of Engineers presently lacks legal authority to use said lands for this purpose. Nothing contained in this Act nor any action taken pursuant to it shall be deemed to be a recognition or admission of any obligation to the owners of such land on the part of the United States or a limitation or deficiency in the rights or powers of the United States with respect to such land or the operation of the reservoir.

(l) To the extent desirable to carry out sections 101(f)(1) and 101(h), the Secretary may transfer funds to the Secretary of Agriculture as may be required for technical assistance to farmers, conduct of research and demonstration and such related investigations as are required to achieve higher onfarm irrigation efficiencies.

(m) All cost associated with the desalting complex shall be nonreimbursable except as provided in sections 101(f) and 101(g).

SEC. 102. (a) The Secretary is authorized to construct a new concrete-lined canal or to line the presently unlined portion of the Coachella Canal of the Boulder Canyon project in California from station 2 + 26 to the beginning of siphon number 7, a length of approximately forty-nine miles.

(b) The total construction charges shall be repayable without interest in equal annual installments over a period of forty years beginning in the year following completion of construction: *Provided*, That repayment shall be prorated by the Secretary between the United States and the Coachella Valley County Water District based upon the benefits that each receives from the project authorized by section 102(a), all as determined by the Secretary. The annual repayment installments shall be nonreimbursable to the extent the Secretary determines that the United States benefits from the project by virtue of the use of water saved in meeting the international settlement objective of this Act. In no event shall the United States reserve such benefit after the Secretary reduces deliveries of mainstream Colorado River water to California to 4.4 million acre-feet per year.

(c) The Secretary is authorized to acquire by purchase, eminent domain, or exchange private lands or interests therein, as may be determined by him to be appropriate, within the Imperial Irrigation District on the Imperial East Mesa which receive, or which have been granted rights to receive, water from Imperial Irrigation District's capacity in the Coachella Canal. Costs of such acquisitions shall be nonreimbursable and the Secretary is authorized to dispose of the acquired lands or interests therein together with the rights to any water therefor on terms and conditions satisfactory to him, and the proceeds therefrom shall be deposited in the General Fund of the Treasury.

(d) The Secretary is authorized to credit Imperial Irrigation District against its final payments for certain outstanding construction charges payable to the United States on account of capacity to be relinquished in the All-American and Coachella Canals as a result of the canal lining program, all as determined by the Secretary: *Provided*, That relinquishment of capacity shall not affect the established basis for allocating operation and maintenance costs of the main All-American Canal to existing contractors.

SEC. 103(a) If the comprehensive agreement on ground water provided for in section 5 of minute numbered 242 is not reached within two years from the date of this Act, the Secretary shall consult with the Secretary of State and determine whether such an agreement is likely to be concluded within a reasonable time. If the Secretary determines that such an agreement is not likely to be concluded within a reasonable time, the Secretary is authorized to:

(1) Construct, operate, and maintain wells in the areas found appropriate for well fields as a means of utilizing ground waters of the Yuma Mesa division, Gila project, and the Valley division, Yuma project areas, Arizona, which wells shall be capable of furnishing approximately one hundred and sixty thousand acre-feet of water per year for use in the United States and for delivery to Mexico in satisfaction of the 1944 Mexican Water Treaty.

(2) Acquire by purchase, eminent domain, or exchange, to the extent determined by him to be appropriate, approximately twenty three thousand five hundred acres of lands or interests therein within approximately five miles of the Mexican border on the Yuma Mesa.

(b) The cost of work provided for in this section shall be nonreimbursable.

SEC. 104. The Secretary is authorized to provide for modifications of the projects authorized by this Act to the extent he determines appropriate for purposes of meeting the international settlement objective of this Act at the lowest overall cost to the United States. No funds for any such modification shall be expended until the expiration of sixty days after the proposed modification has been submitted to the Congress, unless the Congress approves an earlier date by concurrent resolution. The Secretary shall notify the Governors of the Colorado River Basin States of such modification.

SEC. 105. The Secretary is hereby authorized to enter into contracts that he deems necessary to carry out the provisions of this Act in advance of the appropriation of funds therefor.

SEC. 106. In carrying out the provisions of this Act, the Secretary shall consult and cooperate with the Secretary of State, the Administrator of the Environmental Protection Agency, the Secretary of Agriculture, and other affected Federal, State, and local agencies.

SEC. 107. Nothing in this Act shall be deemed to modify the National Environmental Policy Act of 1969, the Federal Water Pollution Control Act, as amended, or, except as expressly stated herein, the provisions of any other Federal law.

SEC. 108. There is hereby authorized to be appropriated the sum of $119,500,000 for the construction of the works and accomplishment of the purposes authorized in sections 101 and 102, and $34,000,000 to accomplish the purpose of section 103, based on April 1973 prices, plus or minus such amounts as may be justified by reason of ordinary fluctuations in construction costs involved therein, and such sums as may be required to operate and maintain such works and to provide for such modifications as may be made pursuant to section 104. There is further authorized to be appropriated such sums as may be necessary to pay condemnation awards in excess of appraised values and to cover costs required in connection with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 90-646).

TITLE II—MEASURES UPSTREAM FROM IMPERIAL DAM

SEC. 201 (a) The Secretary of the Interior shall implement the salinity control policy adopted for the Colorado River in the "Conclusions and Recommendations" published in the Proceedings of the Reconvened Seventh Session of the Conference in the Matter of Pollution of the Interstate Waters of the Colorado River and Its Tributaries in the States of California, Colorado, Utah, Arizona, Nevada, New Mexico, and Wyoming, held in Denver, Colorado, on April 26-27, 1972, under the authority of section 10 of the Federal Water Pollution Control Act (33 U.S.C. 1160), and approved by the Administrator of the Environmental Protection Agency on June 9, 1972.

(b) The Secretary is hereby directed to expedite the investigation, planning, and implementation of the salinity control program generally as described in chapter VI of the Secretary's report entitled, "Colorado River Water Quality Improvement Program, February, 1972".

(c) In conformity with section 201(a) of this Act and the authority of the Environmental Protection Agency under Federal laws, the Secretary, the Administrator of the Environmental Protection Agency, and the Secretary of Agriculture are directed to cooperate and coordinate their activities to effectively carry out the objective of this Act.

SEC. 202. The Secretary is authorized to construct, operate, and maintain the following salinity control units as the initial stage of the Colorado River Basin salinity control program.

(1) The Paradox Valley unit, Montrose County, Colorado, consisting of facilities for collection and disposition of saline ground water of Paradox Valley, including wells, pumps, pipelines, solar evaporation ponds, and all necessary appurtenant and associated works such as roads, fences, dikes, power transmission facilities, and permanent operating facilities.

(2) The Grand Valley unit, Colorado, consisting of measures and all necessary appurtenant and associated works to reduce the seepage of irrigation water from the irrigated lands of Grand Valley into the ground water and from thence into the Colorado River. Measures shall include lining of canals, laterals, and farmer's ditches and the combining of existing canals and latrerals into fewer and more efficient facilities. Prior to initiation of construction of the Grand Valley unit the Secretary shall enter into contracts through which the agencies owning, operating, and maintaining the water distribution systems in Grand Valley, singly or in concert, will assume all obligations relating to the continued operation and maintenance of the unit's facilities to the end that the maximum reduction of salinity inflow to the Colorado will be achieved. The Secretary is also authorized to provide, as an element of the Grand Valley unit, for a technical staff to provide information and assistance to water users on means and measures for limiting excess water applications to irrigated lands.

(3) The Crystal Geyser unit, Utah, consisting of facilities for collection and disposition of saline geyser discharges; including dikes, pipelines, solar evaporation ponds, and all necessary appurtenant works including operating facilities.

(4) The Las Vegas Wash unit, Nevada, consisting of facilities for collection and disposition of saline ground water of Las Vegas Wash, including infiltration galleries, pumps, desalter, pipelines, solar evaporation facilities, and all appurtenant works including but not limited to roads, fences, power transmission facilities, and operating facilities.

SEC. 203. (a) The Secretary is authorized and directed to—

(1) Expedite completion of the planning reports on the following units, described in the Secretary's report, "Colorado River Water Quality Improvement Program, February 1972".

(i) Irrigation source control:
Lower Gunnison.
Uintah Basin.
Colorado River Indian Reservation.
Palo Verde Irrigation District.
(ii) Point source control:
LaVerkin Springs.
Littlefield Springs.
Glenwood-Dotsero Springs.
(iii) Diffuse source control:
Price River.
San Rafael River.
Dirty Devil River.
McElmo Creek.
Big Sandy River.

(2) Submit each planning report on the units named in section 203(a)(1) of this Act promptly to the Colorado River Basin States and to such other parties as the Secretary deems appropriate for their review and comments. After receipt of comments on a unit and careful consideration thereof, the Secretary shall submit each final report with his recommendations, simultaneously, to the President, other concerned Federal departments and agencies, the Congress, and the Colorado River Basin States.

(b) The Secretary is directed—

(1) in the investigation, planning, construction, and implementation of any salinity control unit involving control of salinity from irrigation sources, to cooperate with the Secretary of Agriculture in carrying out research and demonstration projects and in implementing on-the-farm improvements and farm management practices and programs which will further the objective of this Act;

(2) to undertake research on additional methods for accomplishing the objective of this Act, utilizing to the fullest extent practicable the capabilities and resources of other Federal departments and agencies, interstate institutions, States, and private organizations.

SEC. 204. (a) There is hereby created the Colorado River Basin Salinity Control Advisory Council composed of no more than three members from each State appointed by the Governor of each of the Colorado River Basin States.

(b) The Council shall be advisory only and shall—

(1) act as liaison between both the Secretaries of Interior and Agriculture and the Administrator of the Environmental Protection Agency and the States in accomplishing the purposes of this Act;

(2) receive reports from the Secretary on the progress of the salinity control program and review and comment on said reports; and

(3) recommend to both the Secretary and the Administrator of the Environmental Protection Agency appropriate studies of further projects, techniques, or methods for accomplishing the purposes of this Act.

SEC. 205. (a) The Secretary shall allocate the total costs of each unit or separable feature thereof authorized by section 202 of this Act, as follows:

(1) In recognition of Federal responsibility for the Colorado River as an interstate stream and for international comity with Mexico, Federal ownership of the lands of the Colorado River Basin from which most of the dissolved salts originate, and the policy embodies in the Federal Water Pollution Control Act Amendments of 1972 (86 Stat. 816), 75 per centum of the total costs of construction, operation, maintenance, and replacement of each unit or separable feature thereof shall be nonreimbursable.

(2) Twenty-five per centum of the total costs shall be allocated between the Upper Colorado River Basin Fund established by section 5(a) of the Colorado River Storage Project Act (70 Stat. 107) and the Lower Colorado River Basin Development Fund established by section 403(a) of the Colorado River Basin Project Act (82 Stat. 895), after consultation with the Advisory Council created in section 304(a) of this Act and consideration of the following items:

(i) benefits to be derived in each basin from the use of water of improved quality and the use of works for improved water management;

(ii) causes of salinity; and

(iii) availability of revenues in the Lower Colorado River Basin Development Fund and increased revenues to the Upper Colorado River Basin Fund made available under section 305(d) of this Act: *Provided*, That costs allocated to the Upper Colorado River Basin Fund under section 205(a) (2) of this Act shall not exceed 15 per centum of the costs allocated to the Upper Colorado River Basin Fund and the Lower Colorado River Basin Development Fund.

(3) Costs of construction of each unit or separable feature thereof allocated to the upper basin and to the lower basin under section 205(a)(2) of this Act shall be repaid within a fifty-year period without interest from the date such unit or separable feature thereof is determined by the Secretary to be in operation.

(b)(1) Costs of construction, operation, maintenance, and replacement of each unit or separable feature thereof allocated for repayment by the lower basin under section 205(a)(2) of this Act shall be paid in accordance with subsection (2) of this section, from the Lower Colorado River Basin Development Fund.

(2) Section 403(g) of the Colorado River Basin Project Act (82 Stat. 896) is hereby amended as follows: strike the word "and" after the word "Act" in line 8; insert after the word "Act" the following: "(2) for repayment to the general fund of the Treasury the costs of each salinity control unit or separable feature thereof payable from the Lower Colorado River Basin Development Fund in accordance with sections 205(a) (2), 205(a) (3), and 205(b) (1) of the Colorado River Salinity Control Act and"; change paragraph (2) to paragraph (3)

(c) Costs of construction, operation, maintenance, and replacement of each unit or separable feature thereof alflocated for repayment by the upper basin under section 205(a)(2) of this Act shall be paid in accordance with section 205(d) of this Act, from the Upper Colorado River Basin Fund within the limit of the funds made available under section 205(e) of this Act.

(d) Section 5(d) of the Colorado River Storage Act (70 Stat. 108) is hereby amended as follows: strike the word "and" at the end of paragraph (3); strike the period after the word "years" at the end of paragraph (4) and insert a semicolon in lieu thereof followed by the word "and"; add a new paragraph (5) reading:

"(5) the costs of each salinity control unit or separable feature thereof payable from the Upper Colorado River Basin Fund in accordance with sections 205(a)(2), 205(a)(3), and 205(b)(1) of the Colorado River Salinity Control Act."

(e) The Secretary is authorized to make upward adjustments in rates charged for electrical energy under all contracts administered by the Secretary under the Colorado River Storage Project Act (70 Stat. 105; 43 U.S.C. 620) as soon as practicable and to the extent necessary to cover the costs of construction, operation, maintenance, and replacement of units allocated under section 205(a)(2) and in conformity with section 205(a)(3) of this Act: *Provided*, That revenues derived from said rate adjustments shall be available solely for the construction, operation, maintenance, and replacement of salinity control units in the Colorado River Basin herein authorized.

SEC. 206. Commencing on January 1, 1975, and every two years thereafter, the Secretary shall submit, simultaneously, to the President, the Congress, and the Advisory Council created in section 204(a) of this Act a report on the Colorado River salinity control program authorized by this Act covering the progress of investigations, planning, and construction of salinity control units for the previous fiscal year, the effectiveness of such units, anticipated work needed to be accomplished in the future to meet the objectives of this Act with emphasis on the needs during the five years immediately following the date of each report, and any special problems that may be impeding progress in attaining an effective salinity control program. Said report may be included in the biennial report on the quality of water of the Colorado River Basin prepared by the Secretary pursuant to section 15 of the Colorado River Storage Project Act (70 Stat. 111; 43 U.S.C. 602n), section 15 of the Navajo Indian irrigation project, and the initial stage of the San Juan Chama Project Act (76 Stat. 102), and section 6 of the Fryingpan-Arkansas Project Act (76 Stat. 393).

SEC. 207. Except as provided in section 205(b) and 205(d) of this Act with respect to the Colorado River Basin Project Act and the Colorado River Storage Project Act, respectively, nothing in this Act shall be construed to alter, amend, repeal, modify, interpret, or be in conflict with 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 against California and others (376 U.S. 340), the Boulder Canyon Project Act (45 Stat. 1057), Boulder Canyon Project Adjustment Act (54 Stat. 774; 43 U.S.C. 618a), section 15 of the Colorado River Storage Project Act (70 Stat. 111; 43 U.S.C. 620n), the Colorado River Basin Project Act (82 Stat. 885); section 6 of the Fryingpan-Arkansas Project Act (76 Stat. 393), section 15 of the Navajo Indian irrigation project and initial stage of the San Juan-Chama Project Act (76 Stat. 102), the National Environmental Policy Act of 1969, and the Federal Water Pollution Control Act, as amended.

SEC. 208 (a) The Secretary is authorized to provide for modifications of the projects authorized by this Act as determined to be appropriate for purposes of meeting the objective of this Act. No funds for any such modification shall be expended until the expiration of sixty days after the proposed modification has been submitted to appropriate committees of the Congress, and not then if disapproved by said committees, except that funds may be expended prior to the expiration of such sixty days in any case in which the Congress approves an earlier date by concurrent resolution. The Governors of the Colorado River Basin States shall be notified of these changes.

(b) The Secretary is hereby authorized to enter into contracts that he deems necessary to carry out the provisions of this Act, in advance of the appropriation of funds therefor. There is hereby authorized to be appropriated the sum of $121,200,000 for the construction of the works and for other purposes authorized in section 202 of this Act, based on April 1973 prices, plus or minus such amounts as may be justified by reason of ordinary fluctuations in costs involved therein, and such sums as may be required to operate and maintain such works. There is further authorized to be appropriated such sums as may be necessary to pay condemnation awards in excess of appraised values and to cover costs required in connection with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 90-646).

SEC. 209. As used in this Act—

(a) all terms that are defined in the Colorado River Compact shall have the meanings therein defined;

(b) "Colorado River Basin States" means the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming.

Public Law 93-320

AN ACT

Juen 24, 1974
[H.R. 12165]

To authorize the construction, operation, and maintenance of certain works in the Colorado River Basin to control the salinity of water delivered to users in the United States and Mexico.

Colorado River Basin Salinity Control Act.
43 USC 1571 note.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Colorado River Basin Salinity Control Act".

TITLE I—PROGRAMS DOWNSTREAM FROM IMPERIAL DAM

U.S. and Mexico, water quality improvement.
43 USC 1571.

SEC. 101. (a) The Secretary of the Interior, hereinafter referred to as the "Secretary", is authorized and directed to proceed with a program of works of improvement for the enhancement and protection of the quality of water available in the Colorado River for use in the United Sates and the Republic of Mexico, and to enable the United States to comply with its obligations under the agreement with Mexico of August 30, 1973 (Minute No. 242 of the International Boundary and Water Commission, United States and Mexico), concluded pursuant to the Treaty of February 3, 1944 (TS 994), in accordance with the provisions of this Act.

24 UST 1968.

59 Stat. 1219.

Desalting complexes, construction and maintenance.

(b)(1) The Secretary is authorized to construct, operate, and maintain a desalting complex, including (1) a desalting plant to reduce the salinity of drain water from the Wellton-Mohawk division of the Gila project, Arizona (hereinafter referred to as the division), including a pretreatment plant for settling, softening, and filtration of the drain water to be desalted; (2) the necessary appurtenant works including the intake pumping plant system, product waterline, power transmission facilities, and permanent operating facilities; (3) the necessary extension in the United States and Mexico of the existing bypass drain to carry the reject stream from the desalting plant and other drainage waters to the Santa Clara Slough in Mexico, with the part in Mexico, subject to arrangements made pursuant to section 101(d); (4) replacement of the metal flume in the existing main outlet drain extension with a concrete siphon; (5) reduction of the quantity of irrigation return flows through acquisition of lands to reduce the size of the division, and irrigation efficiency improvements to minimize return flows; (6) acquire on behalf of the United States such lands or interest in lands in the Painted Rock Reservoir as may be necessary to operate the project in accordance with the obligations of Minute No. 242, and (7) all associated facilities including roads, railroad spur, and transmission lines.

Desalting plants, treatment capacity.

(2) The desalting plant shall be designed to treat approximately one hundred and twenty-nine million gallons a day of drain water using advanced

technology commercially available. The plant shall effect recovery initially of not less than 70 per centum of the drain water as product water, and shall effect reduction of not less than 90 per centum of the dissolved solids in the feed water. The Secretary shall use sources of electric power supply for the desalting complex that will not diminish the supply of power to preference customers from Federal power systems operated by the Secretary. All costs associated with the desalting plant shall be nonreimbursable.

Nonreimbursable costs.

(c) Replacement of the reject stream from the desalting plant and of any Wellton-Mohawk drainage water bypassed to the Santa Clara Slough to accomplish essential operation except at such times when there exists surplus water of the Colorado River under the terms of the Mexican Water Treaty of 1944, is recognized as a national obligation as provided in section 202 of the Colorado River Basin Project Act (82 Stat. 895). Studies to identify feasible measures to provide adequate replacement water shall be completed not later than June 30, 1980. Said studies shall be limited to potential sources within the States of Arizona, California, Colorado, New Mexico, and those portions of Nevada, Utah, and Wyoming which are within the natural drainage basin of the Colorado River. Measures found necessary to replace the reject stream from the desalting plant and any Wellton-Mohawk drainage bypassed to the Santa Clara Slough to accomplish essential operations may be undertaken independently of the national obligation set forth in section 202 of the Colorado River Basin Project Act.

Replacement water, studies.

59 Stat. 1219.

43 USC 1512.

(d) The Secretary is hereby authorized to advance funds to the United States section, International Boundary and Water Commission (IBWC), for construction, operation, and maintenance by Mexico pursuant to Minute No. 242 of that portion of the bypass drain within Mexico. Such funds shall be transferred to an appropriate Mexican agency, under arrangements to be concluded by the IBWC providing for the construction, operation, and maintenance of such facility by Mexico.

U.S. section, IBWC, advance funds.

24 UST 1968.

(e) Any desalted water not needed for the purpose of this title may be exchanged at prices and under terms and conditions satisfactory to the Secretary and the proceeds therefrom shall be deposited in the General Fund of the Treasury. The city of Yuma, Arizona, shall have first right of refusal to any such water.

Desalted water exchange.

(f) For the purpose of reducing the return flows from the diversion to one hundred and seventy-five thousand acre-feet or less, annually, the Secretary is authorized to:

Return flow reduction.

(1) Accelerate the cooperative program of Irrigation Management Services with the Wellton-Mohawk Irrigation and Drainage District, hereinafter referred to as the district, for the purpose of improving irrigation efficiency. The district shall bear its share of the cost of such program as determined by the Secretary.

(2) Acquire, by purchase or through eminent domain or exchange, or the extent determined by him to be appropriate, lands or interests in lands to reduce the existing seventy-five thousand developed and undeveloped irrigable acres authorized by the Act of July 30, 1947 (61 Stat. 628), known as the Gila Reauthorization Act. The initial reduction in irrigable acreage shall be limited to approximately ten thousand acres. If the Secretary determines that the irrigable acreage of the division must be reduced below sixty-five thousand acres of irrigable lands to carry out the

Irrigable acreage reduction.

43 USC 613.

Limitation.

purpose of this section, the Secretary is authorized, with the consent of the district, to acquire additional lands, as may be deemed by him to be appropriate.

Acquired lands, disposal.

(g) The Secretary is authorized to dispose of the acquired lands and interests therein on terms and conditions satisfactory to him and meeting the objective of this Act.

System improvements, installation assistance.

(h) The Secretary is authorized, either in conjunction with or in lieu of land acquisition, to assist water users in the division in installing system improvements, such as ditch lining, change of field layouts, automatic equipment, sprinkler systems and bubbler systems, as a means of increasing irrigation efficiencies: *Provided, however*, That all costs associated with the improvements authorized herein and allocated to the water users on the basis of benefits received, as determined by the Secretary, shall be reimbursed to the United States in amounts and on terms and conditions satisfactory to the Secretary.

Costs, reimbursement to U.S.

Contract amendment.

(i) The Secretary is authorized to amend the contract between the United States and the district dated March 4, 1952, as amended, to provide that—

(1) the portion of the existing repayment obligation owing to the United States allocable to irrigable acreage eliminated from the division for the purposes of this title, as determined by the Secretary, shall be nonreimbursable; and

(2) if deemed appropriate by the Secretary, the district shall be given credit against its outstanding repayment obligation to offset any increase in operation and maintenance assessments per acre which may result from the district's decreased operation and maintenance base, all as determined by the Secretary.

Land acquisition for storage.

(j) The Secretary is authorized to acquire through the Corps of Engineers fee title to, or other necessary interests in, additional lands above the Painted Rock Dam in Arizona that are required for the temporary storage capacity needed to permit operation of the dam and reservoir in times of serious flooding in accordance with the obligations of the United States under Minute No. 242. No funds shall be expended for acquisition of land or interests therein until it is finally determined by a Federal court of competent jurisdiction that the Corps of Engineers presently lacks legal authority to use said lands for this purpose. Nothing contained in this title nor any action taken pursuant to it shall be deemed to be a recognition or admission of any obligation to the owners of such land on the part of the United States or a limitation or deficiency in the rights or powers of the United States with respect to such lands or the operation of the reservoir.

24 UST 1968.

Transfer of funds.

(k) To the extent desirable to carry out sections 101(f)(1) and 101(h), the Secretary may transfer funds to the Secretary of Agriculture as may be required for technical assistance to farmers, conduct of research and demonstrations, and such related investigations as are required to achieve higher on-farm irrigation efficiencies.

Nonreimbursable costs.

(l) All cost associated with the desalting complex shall be nonreimbursable except as provided in sections 101(f)(1) and 101(h).

Canal or canal lining, construction.
43 USC 1572.

SEC. 102. (a) To assist in meeting salinity control objectives of Minute No. 242 during an interim period, the Secretary is authorized to construct a new concrete-lined canal or, to line the presently unlined portion of the Coachella Canal of the Boulder Canyon project, California, from station 2 plus 26 to the beginning of siphon numbered 7, a length of approximately forty-nine miles. The United States shall be entitled to temporary use of a quantity of water, for

the purpose of meeting the salinity control objectives of Minute No. 242, during an interim period, equal to the quantity of water conserved by constructing or lining the said canal. The interim period shall commence on completion of construction or lining said canal and shall end the first year that the Secretary delivers main stream Colorado River water to California in an amount less than the sum of the quantities requested by (1) the California agencies under contracts made pursuant to section 5 of the Boulder Canyon Project Act (45 Stat. 1057), and (2) Federal establishments to meet their water rights acquired in California in accordance with the Supreme Court decree in Arizona against California (376 U.S. 340).

43 USC 617d.

(b) The charges for total construction shall be repayable without interest in equal annual installments over a period of forty years beginning in the year following completion of construction: *Provided*, That, repayment shall be prorated between the United States and the Coachella Valley County Water District, and the Secretary is authorized to enter into a repayment contract with Coachella Valley County Water District for that purpose. Such contract shall provide that annual repayment installments shall be nonreimbursable during the interim period, defined in section 102(a) of this title and shall provide that after the interim period, said annual repayment installments or portions thereof, shall be paid by Coachella Valley County Water District.

Repayment.

Repayment contract.

(c) The Secretary is authorized to acquire by purchase, eminent domain, or exchange private lands or interests therein, as may be determined by him to be appropriate, within the Imperial Irrigation District on the Imperial East Mesa which receive, or which have been granted rights to receive, water from Imperial Irrigation District's capacity in the Coachella Canal. Costs of such acquisitions shall be nonreimbursable and the Secretary shall return such lands to the public domain. The United States shall not acquire any water rights by reason of this land acquisition.

Private lands, acquisition.

(d) The Secretary is authorized to credit Imperial Irrigation District against its final payments for certain outstanding construction charges payable to the United States on account of capacity to be relinquished in the Coachella Canal as a result of the canal lining program, all as determined by the Secretary: *Provided*, That, relinquishment of capacity shall not affect the established basis for allocating operation and maintenance costs of the main All-American Canal to existing contractors.

Imperial Irrigation District, construction charges, credit.

(e) The Secretary is authorized and directed to cede the following land to the Cocopah Tribe of Indians, subject to rights-of-way for existing levees, to be held in trust by the United States for the Cocopah Tribe of Indians:

Cocopah Tribe of Indians, lands in trust.

Township 9 south, range 25 west of the Gila and Salt River meridian, Arizona;

Section 25: Lots 18, 19, 20, 21, 22, and 23;

Section 26: Lots 1, 12, 13, 14, and 15;

Section 27: Lot 3; and all accretion to the above described lands.

The Secretary is authorized and directed to construct three bridges, one of which shall be capable of accommodating heavy vehicular traffic, over the portion of the bypass drain which crosses the reservation of the Cocopah Tribe of Indians. The transfer of lands to the Cocopah Indian Reservation and the construction of bridges across the bypass drain shall constitute full and complete payment to said tribe for the rights-of-way required for construction of the bypass drain and electrical transmission lines for works authorized by this title.

Bridges construction.

43 USC 1573.
Well fields, construction and maintenance.
24 UST 1968.
59 Stat. 1219.
Land acquisition.

SEC. 103. (a) The Secretary is authorized to:

(1) Construct, operate, and maintain, consistent with Minute No. 242, well fields capable of furnishing approximately one hundred and sixty thousand acre-feet of water per year for use in the United States and for delivery to Mexico in satisfaction of the 1944 Mexican Water Treaty.

(2) Acquire by purchase, eminent domain, or exchange, to the extent determined by him to be appropriate, approximately twenty-three thousand five hundred acres of lands or interests therein within approximately five miles of the Mexican border on the Yuma Mesa: *Provided, however*, That any such lands which are presently owned by the State of Arizona may be acquired or exchanged for Federal lands.

Land replacement.
43 USC 613.

(3) Any lands removed from the jurisdiction of the Yuma Mesa Irrigation and Drainage District pursuant to clause (2) of this subsection which were available for use under the Gila Reauthorization Act (61 Stat. 628), shall be replaced with like lands within or adjacent to the Yuma Mesa division of the project. In the development of these substituted lands or any other lands within the Gila project, the Secretary may provide for full utilization of the Gila Gravity Main Canal in addition to contracted capacities.

Nonreimbursable costs.

(b) The cost of work provided for in this section, including delivery of water to Mexico, shall be nonreimbursable; except to the extent that the waters furnished are used in the United States.

Project modification.
43 USC 1574.

SEC. 104. The Secretary is authorized to provide for modifications of the projects authorized by this title to the extent he determines appropriate for purposes of meeting the international settlement objective of this title at the lowest overall cost to the United States. No funds for any such modification shall be expended until the expiration of sixty days after the proposed modification has been submitted to the appropriate committees of the Congress, unless the Congress approves an earlier date by concurrent resolution. The Secretary shall notify the Governors of the Colorado River Basin States of such modifications.

Contract authority.
43 USC 1575.

SEC. 105. The Secretary is hereby authorized to enter into contracts that he deems necessary to carry out the provisions of this title in advance of the appropriation of funds therefor.

Interagency cooperation.
43 USC 1576.

SEC. 106. In carrying out the provisions of this title, the Secretary shall consult and cooperate with the Secretary of State, the Administrator of the Environmental Protection Agency, the Secretary of Agriculture, and other affected Federal, State, and local agencies.

43 USC 1577.
42 USC 4321 note.
33 USC 1251 note.

SEC. 107. Nothing in this Act shall be deemed to modify the national Environmental Policy Act of 1969, the Federal Water Pollution Control Act, as amended, or, except as expressly stated herein, the provisions of any other Federal law.

Appropriation.
43 USC 1578.

SEC. 108. There is hereby authorized to be appropriated the sum of $121,500,000 for the construction of the works and accomplishment of the purposes authorized in sections 101 and 102, and $34,000,000 to accomplish the purposes of section 103, based on April 1973 prices, plus or minus such amounts as may be justified by reason of ordinary fluctuations in construction costs involved therein, and such sums as may be required to operate and maintain such works and to provide for such modifications as may be made pursuant to section 104. There is further authorized to be appropriated such sums as may be necessary to pay condemnation awards in

excess of appraised values and to cover costs required in connection with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 90-646).

42 USC 4601 note.

TITLE II—MEASURES UPSTREAM FROM IMPERIAL DAM

SEC. 201. (a) The Secretary of the Interior shall implement the salinity control policy adopted for the Colorado River in the "Conclusions and Recommendations" published in the Proceedings of the Reconvened Seventh Session of the Conference in the Matter of Pollution of the Interstate Waters of the Colorado River and Its Tributaries in the States of California, Colorado, Utah, Arizona, Nevada, New Mexico, and Wyoming, held in Denver, Colorado, on April 26-27, 1972, under the authority of section 10 of the Federal Water Pollution Control Act (33 U.S.C. 1160), and approved by the Administrator of the Environmental Protection Agency on June 9, 1972.

43 USC 1591.

(b) The Secretary is hereby directed to expedite the investigation, planning, and implementation of the salinity control program generally as described in chapter VI of the Secretary's report entitled "Colorado River Water Quality Improvement Program, February 1972".

(c) In conformity with section 201(a) of this title and the authority of the Environmental Protection Agency under Federal laws, the Secretary, the Administrator of the Environmental Protection Agency, and the Secretary of Agriculture are directed to cooperate and coordinate their activities effectively to carry out the objective of this title.

Interagency cooperation.

SEC. 202. The Secretary is authorized to construct, operate, and maintain the following salinity control units as the initial stage of the Colorado River Basin salinity control program.

Salinity control units, construction and maintenance. 43 USC 1592.

(1) The Paradox Valley unit, Montrose County, Colorado, consisting of facilities for collection and disposition of saline ground water of Paradox Valley, including wells, pumps, pipelines, solar evaporation ponds, and all necessary appurtenant and associated works such as roads, fences, dikes, power transmission facilities, and permanent operating facilities.

(2) The Grand Valley unit, Colorado, consisting of measures and all necessary appurtenant and associated works to reduce the seepage of irrigation water from the irrigated lands of Grand Valley into the ground water and thence into the Colorado River. Measures shall include lining of canals and laterals, and the combining of existing canals and laterals into fewer and more efficient facilities. Prior to initiation of construction of the Grand Valley unit the Secretary shall enter into contracts through which the agencies owning, operating, and maintaining the water distribution systems in Grand Valley, singly or in concert, will assume all obligations relating to the continued operation and maintenance of the unit's facilities to the end that the maximum reduction of salinity inflow to the Colorado River will be achieved. The Secretary is also authorized to provide, as an element of the Grand Valley unit, for a technical staff to provide information and assistance to water users on means and measures for limiting excess water applications to irrigated lands: *Provided*, That such assistance shall not exceed a period of five years after funds first become available under this title. The Secretary will enter into agreements with the Secretary of Agriculture to develop a unified control plan for the Grand Valley unit. The Secretary of agriculture is directed to cooperate in the planning and construction of on-farm system measures under programs available to that Department.

(3) The Crystal Geyser unit, Utah, consisting of facilities for collection and disposition of saline geyser discharges; including dikes, pipelines, solar evaporation ponds, and all necessary appurtenant works including operating facilities.

(4) The Las Vegas Wash unit, Nevada, consisting of facilities for collection and disposition of saline ground water of Las Vegas Wash, including infiltration galleries, pumps, desalter, pipelines, solar evaporation facilities, and all appurtenant works including but not limited to roads, fences, power transmission facilities, and operating facilities.

43 USC 1593. Planning reports.

SEC. 203. (a) The Secretary is authorized and directed to—

(1) Expedite completion of the planning reports on the following units, described in the Secretary's report, "Colorado River Water Quality Improvement Program, February 1972":

(i) Irrigation source control:
Lower Gunnison
Uintah Basin
Colorado River Indian Reservation
Palo Verde Irrigation District

(ii) Point source control:
LaVerkin Springs
Littlefield Springs
Glenwood-Dotsero Springs

(iii) Diffuse source control:
Price River
San Rafael River
Dirty Devil River
McElmo Creek
Big Sandy River

Reports.

Submittal to President and Congress.

(2) Submit each planning report on the units named in section 203(a)(1) of this title promptly to the Colorado River Basin States and to such other parties as the Secretary deems appropriate for their review and comments. After receipt of comments on a unit and careful consideration thereof, the Secretary shall submit each final report with his recommendations, simultaneously, to the President, other concerned Federal departments and agencies, the Congress, and the Colorado River Basin States.

(b) The Secretary is directed—

Research and demonstration projects.

(1) in the investigation, planning, construction, and implementation of any salinity control unit involving control of salinity from irrigation sources, to cooperate with the Secretary of Agriculture in carrying out research and demonstration projects and in implementing on-the-farm improvements and farm management practices and programs which will further the objective of this title;

(2) to undertake research on additional methods for accomplishing the objective of this title, utilizing to the fullest extent practicable the capabilities and resources of other Federal departments and agencies, interstate institutions, States, and private organizations.

Colorado River Basin Salinity Control Advisory Council.
Establishment; membership.
43 USC 1594.
Duties.

SEC. 204. (a) There is hereby created the Colorado River Basin Salinity Control Advisory Council composed of no more than three members from each State appointed by the Governor of each of the Colorado River Basin States.

(b) The Council shall be advisory only and shall—

(1) act as liaison between both the Secretaries of Interior and Agriculture and the Administrator of the Environmental Protection Agency and the States in accomplishing the purposes of this title;

(2) receive reports from the Secretary on the progress of the salinity control program and review and comment on said reports; and

(3) recommend to both the Secretary and the Administrator of the Environmental Protection Agency appropriate studies of further projects, techniques, or methods for accomplishing the purposes of this title.

Costs, allocation. 43 USC 1595.

SEC. 205. (a) The Secretary shall allocate the total costs of each unit or separable feature thereof authorized by section 202 of this title, as follows:

(1) In recognition of Federal responsibility for the Colorado River as an interstate stream and for international comity with Mexico, Federal ownership of the lands of the Colorado River Basin from which most of the dissolved salts originate, and the policy embodied in the Federal Water Pollution Control Act Amendments of 1972 (86 Stat. 816), 75 per centum of the total costs of construction, operation, maintenance, and replacement of each unit or separable feature thereof shall be nonreimbursable.

33 USC 1251 note.

(2) Twenty-five per centum of the total costs shall be allocated between the Upper Colorado River Basin Fund established by section 5(a) of the Colorado River Storage Project Act (70 Stat. 107) and the Lower Colorado River Basin Development Fund established by section 403(a) of the Colorado River Basin Project Act (82 Stat. 895), after consultation with the Advisory Council created in section 204(a) of this title and consideration of the following items:

43 USC 620d.

43 USC 1543.

(i) benefits to be derived in each basin from the use of water of improved quality and the use of works for improved water management;

(ii) causes of salinity; and

(iii) availability of revenues in the Lower Colorado River Basin Development Fund and increased revenues to the Upper Colorado River Basin Fund made available under section 205(d) of this title: *Provided*, That costs allocated to the Upper Colorado River Basin Fund under section 205(a)(2) of this title shall not exceed 15 per centum of the costs allocated to the Upper Colorado River Basin Fund and the Lower Colorado River Basin Development Fund.

Costs, limitation.

(3) Costs of construction of each unit or separable feature thereof allocated to the upper basin and to the lower basin under section 205(a)(2) of this title shall be repaid within a fifty-year period without interest from the date such unit or separable feature thereof is determined by the Secretary to be in operation.

Construction costs, repayment.

(b)(1) Costs of construction, operation, maintenance, and replacement of each unit or separable feature thereof allocated for repayment by the lower basin under section 205(a)(2) of this title shall be paid in accordance with subsection 205(b)(2) of this title, from the Lower Colorado River Basin Development Fund.

(2) Section 403(g) of the Colorado River Basin Project Act (82 Stat. 896) is hereby amended as follows: strike the word "and" after the word "Act" in line 8; insert after the word "Act," the following "(2) for repayment to the general fund of the Treasury the costs of each salinity control unit or separable feature thereof payable from the Lower Colorado River Basin Development Fund in accordance with sections 205(a)(2), 205(a)(3), and 205(b)(1) of the Colorado River Salinity Control Act and"; change paragraph (2) to paragraph (3).

43 USC 1543.

(c) Costs of construction, operation, maintenance, and replacement of each unit or separable feature thereof allocated for repayment by the upper

basin under section 205(a)(2) of this title shall be paid in accordance with section 205(d) of this title from the Upper Colorado River Basin Fund within the limit of the funds made available under section 205(e) of this title.

43 USC 620d.

(d) Section 5(d) of the Colorado River Storage Project Act (70 Stat. 108) is hereby amended as follows: strike the word "and" at the end of paragraph (3); strike the period after the word "years" at the end of paragraph (4) and insert a semicolon in lieu thereof followed by the word "and"; add a new paragraph (5) reading:

"(5) the costs of each salinity control unit or separable feature thereof payable from the Upper colorado River Basin Fund in accordance with sections 205(a)(2), 205(a)(3), and 205(c) of the Colorado River Salinity Control Act."

Electrical energy rates, adjustments.

(e) The Secretary is authorized to make upward adjustments in rates charged for electrical energy under all contracts administered by the Secretary under the Colorado River Storage Project Act (70 Stat. 105, 43 U.S.C. 620) as soon as practicable and to the extent necessary to cover the costs of construction, operation, maintenance, and replacement of units allocated under section 205(a)(2) and in conformity with section 205(a)(3) of this title: *Provided*, That revenues derived from said rate adjustments shall be available solely for the construction, operation, maintenance, and replacement of salinity control units in the Colorado River Basin herein authorized.

Report to President, Congress and Advisory Council.
43 USC 1596.

SEC. 206. Commencing on January 1, 1975, and every two years thereafter, the Secretary shall submit, simultaneously, to the President, the Congress, and the Advisory Council created in section 204(a) of this title, a report on the Colorado River salinity control program authorized by this title covering the progress of investigations, planning, and construction of salinity control units for the previous fiscal year, the effectiveness of such units, anticipated work needed to be accomplished in the future to meet the objectives of this title, with emphasis on the needs during the five years immediately following the date of each report, and any special problems that may be impeding progress in attaining an effective salinity control program. Said report may be included in the biennial report on the quality of water of the Colorado River Basin prepared by the Secretary pursuant to section 15 of the Colorado River Storage Project Act (70 Stat. 111; 43 U.S.C. 602n), section 15 of the Navajo Indian irrigation project, and the initial stage of the San Juan Chama Project Act (76 Stat. 102), and section 6 of the Fryingpan-Arkansas Project Act (76 Stat. 393).

43 USC 615ww.
43 USC 616c.
43 USC 1597

SEC. 207. Except as provided in section 205(b) and 205(d) of this title, with respect to the Colorado River Basin Project Act and the Colorado River Storage Project Act, respectively, nothing in this title shall be construed to alter, amend, repeal, modify, interpret, or be in conflict with 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 against California and others (376 U.S. 340), the Boulder Canyon Project Act (45 Stat. 1057), Boulder Canyon Project Adjustment Act (54 Stat. 774; 43 U.S.C. 618a), section 15 of the Colorado River Storage Project Act (70 Stat. 111; 43 U.S.C. 620n), the Colorado River Basin Project Act (82 Stat. 885), section 6 of the Fryingpan-Arkansas Project Act (76 Stat. 393), section 15 of the Navajo Indian irrigation project and initial stage of the San Juan-Chama Project Act (76 Stat. 102), the National Environmental Policy Act of 1969, and the Federal Water Pollution Control Act, as amended.

43 USC 1501 note.
42 USC 4321 note.
33 USC 1251 note.

Project modifications.
Funds, expenditure.
43 USC 1598.

SEC. 208. (a) The Secretary is authorized to provide for modifications of the projects authorized by this title as determined to be appropriate for purposes of meeting the objective of this title. No funds for any such modification shall be expended until the expiration of sixty days after the proposed modification has been submitted to appropriate committees of the Congress, and not then if disapproved by said committees, except that funds may be expended prior to the expiration of such sixty days in any case in which the Congress approves an earlier date by concurrent resolution. The Governors of the Colorado River Basin States shall be notified of these changes.

Contract authority.

Appropriation.

(b) The Secretary is hereby authorized to enter into contracts that he deems necessary to carry out the provisions of this title, in advance of the appropriation of funds therefor. There is hereby authorized to be appropriated the sum of $125,100,000 for the construction of the works and for other purposes authorized in section 202 of this title, based on April 1973 prices, plus or minus such amounts as may be justified by reason of ordinary fluctuations in costs involved therein, and such sums as may be required to operate and maintain such works. There is further authorized to be appropriated such sums as may be necessary to pay condemnation awards in excess of appraised values and to cover costs required in connection with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 90-646).

42 USC 4601 note.
43 USC 1599.

SEC. 209. As used in this title—

(a) all terms that are defined in the Colorado River Compact shall have the meanings therein defined;

"Colorado River Basin States."

(b) "Colorado River Basin States" means the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming.

Approved June 24, 1974.

Public Law 93-321