STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS

DIVISION OF WATER RESOURCES

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REPORT OF

SACRAMENTO-SAN JOAQUIN

WATER SUPERVISION

FOR

1949

JUNE, 1950

TABLE OF CONTENTS

Page

ALPHABETICAL INDEX TO TABLES 5

LIST OF PLATES 12

ACKNOWLEDGMENT 13

ADVISORY COMMITTEE 14

ORGANIZATION 15

FOREWORD 16

SACRAMENTO-SAN JOAQUIN WATER SUPERVISION 17
- Objectives 17
- Scope of Work 17
- Water Supervision Activities 18
- Hydrographic Activities of Cooperating Agencies 21

SHASTA AND FRIANT RESERVOIR OPERATIONS 22
- Reservoir Data 22
- Shasta Reservoir Operation - 1949 23
- Friant Reservoir Operation - 1949 24

RUNOFF AND WATER SUPPLY 24
- 1949 Inventory of Runoff 25
- 1949 Runoff Comparisons 25
- Primary Irrigation Supplies 26
- Accretions to Stream Flow 26
  - Sacramento Valley Accretions 27
  - San Joaquin Valley Accretions 28
- Stream Flow Measurements 30
- Preliminary Data from Coöperating Agencies 30
- Stream Flow Bulletins 31
- Notes on Certain Gaging Stations 31
  - Sacramento River at Sacramento 31
  - Minor Tributaries to Sacramento River 32
  - Additional Stations Reported in 1949 32
- Automatic Radio Stream Gage Transmission 33
- Precipitation 34

USE OF WATER FOR IRRIGATION 35
- Irrigation Diversions 35
- Irrigated Acreage 37
- 1948 Sacramento-San Joaquin Delta Crop Survey 38
- Use of Water in Delta 38
- Gross Duty of Water 39

SALINITY INVESTIGATIONS 39
- Purpose 39
- Scope 40
- Complete or Partial Analyses of Surface Flows 40
- Sacramento River Water Moves Southward 40
- Station Maintenance and Records 43
- Daily Salinity Observations 43
- Salinity Bulletins 44
- Area of Salinity Encroachment 44

TIDE GAGES 44

TABLES . . . . . 47 through 193
- Summary - Runoff Percentage, Stream Flow, Accretions and Acreage. . 47 through 52
- Daily Stream Flows . . . . . 52 through 119
- Diversions and Irrigated Acreage . . . . . 120 through 176
- Salinity Observations . . . . . 177 through 193

POCKET . . . . . Inside Back Cover
- Map Showing Location of Gaging Stations and of Points of Diversion

ALPHABETICAL
INDEX TO TABLES

Page

ACCRETIONS 26
Sacramento River and Tributaries 48
San Joaquin River and Tributaries 50
Tule River 51

ACREAGE IRRIGATED
Annual - Sacramento-San Joaquin River Systems, 1940 through 1949 52
From each point of diversion . . . . . See "Diversions"
Rice Acreage, Annual 176
Seasonal Comparative - Each Stream System 52
Seasonal, Sacramento and San Joaquin Valley 52, 120
Summary by Sacramento River Sections 120, 176
Water Utilization Summary - Sacramento and San Joaquin Rivers and Tributaries 120

AMERICAN RIVER
Accretions 48
Acreage Irrigated 52, 120, 141
Diversions 48, 120, 141, 172
Duty of Water 120
Stream Flow 47, 48, 89

ANALYSIS OF WATER 187

ANNUAL RUNOFF IN PERCENT OF 50-YEAR NORMAL 47

ANTELOPE CREEK - Stream Flow
near Red Bluff 48, 63
near Mouth 48, 64

AUBURN RAVINE AT HIGHWAY 99-E - Stream Flow 48, 86

BACK BORROW PIT
Accretions 48
Acreage Irrigated 52, 120, 134
Diversions 120, 134
Duty of Water 120
Stream Flow 48, 75, 76

BATTLE CREEK NEAR COTTONWOOD - Stream Flow 48, 61

BEAR CREEK ABOVE SAN JOAQUIN RIVER (NEAR STEVINSON) - Stream Flow 50, 106

BEAR CREEK NEAR LOCKEFORD - Stream Flow 49, 96

BEAR RIVER
Acreage Irrigated 52, 140
Diversions 140
Stream Flow 49, 85

BUTLER SLOUGH NEAR MOUTH - Stream Flow 48, 63

BUTTE CREEK AND BUTTE SLOUGH
Accretions 48, 49
Acreage Irrigated 52, 120, 136
Diversions 120, 136
Duty of Water 120
Stream Flow 48, 49, 71, 72, 78

CACHE CREEK - Stream Flow
at Capay 49, 90
at Yolo 49, 90

CACHE SLOUGH
Acreage Irrigated 135
Diversions 135

CALAVERAS RIVER
Accretions 49
Acreage Irrigated 52, 143
Diversions 143
Stream Flow 49, 96, 97

CHAMPLIN SLOUGH NEAR MOUTH - Stream Flow 48, 67

CHICO CREEK - Stream Flow
near Chico 48, 69
near Mouth 48, 70

CLEAR CREEK NEAR IGO - Stream Flow 48, 60

COLUSA TROUGH
Accretions 49
Acreage Irrigated 52, 120, 133
Diversions 120, 133
Duty of Water 120
Stream Flow 49, 75, 76

COON CREEK AT HIGHWAY 99-E - Stream Flow 48, 85

ALPHABETICAL
INDEX TO TABLES (CONTINUED)

Page

COSUMNES RIVER
- Accretions . . . 49
- Acreage Irrigated . . . 52, 142
- Diversions . . . 142
- Stream Flow . . . 49, 92, 93

COTTONWOOD CREEK NEAR COTTONWOOD - Stream Flow . . . 48, 61

COTTONWOOD CREEK NEAR FRIANT - Stream Flow . . . 50, 105

CRAIG CREEK NEAR MOUTH - Stream Flow . . . 48, 62

CROSS CREEK BELOW LAKELANDS CANAL #2 - Stream Flow . . . 51, 119

DEER CREEK - Stream Flow
- near Vina . . . 48, 68
- near Mouth . . . 48, 69

DEER CREEK NEAR SMARTVILLE - Stream Flow . . . 48, 84

DELTA - Sacramento-San Joaquin River
- Acreage Irrigated . . . 37
- Analysis of Water . . . 187
- Runoff to Delta . . . 49
- Salinity . . . 179, 185

DELTA UPLANDS FROM CACHE SLOUGH - Diversions . . . 135

DISCHARGE - Flow of Streams . . . See "Stream Flow"

DIVERSIONS
- Accretions, Relation to . . . 48, 50, 51
- At each point of diversion on
  - American River . . . 141
  - Back Borrow Pit . . . 134
  - Bear River . . . 140
  - Butte Creek, Lower, and Butte Slough . . . 136
  - Cache Slough (Delta Uplands) . . . 135
  - Calaveras River . . . 143
  - Colusa Trough . . . 133
  - Cosumnes River . . . 142
  - Dry Creek (Tributary to Tuolumne River) . . . 165
  - Feather River . . . 139
  - Fresno Slough and Fresno Slough By-Pass . . . 160
  - Knights Landing Ridge Cut . . . 135
  - Merced River . . . 162
  - Mokelumne River . . . 142
  - Old San Joaquin River (Delta Uplands) . . . 145
  - Sacramento River . . . 124
  - San Joaquin River (Stockton to Vernalis, Delta Uplands) . . . 147
  - San Joaquin River (Vernalis to Fremont Ford) . . . 149
  - San Joaquin River (Fremont Ford to Gravelly Ford) . . . 150
  - San Joaquin River (Gravelly Ford to Friant) . . . 154
  - Stanislaus River . . . 166
  - Sutter By-Pass and Sacramento Slough . . . 137
  - Tom Paine Slough (Delta Uplands) . . . 146
  - Tule River . . . 168
  - Tuolumne River . . . 164
  - Yolo By-Pass . . . 135
  - Yuba River . . . 140
- Average Monthly, in percent of seasonal - Sacramento-San Joaquin Valley . . . 170
- Irrigation Districts
  - Merced Irrigation District . . . 163
  - Modesto Irrigation District . . . 164
  - Oakdale Irrigation District . . . 167
  - South San Joaquin Irrigation District . . . 167
  - Turlock Irrigation District . . . 164
- Monthly, Comparative Seasonal - 1939 through 1949
  - American River . . . 172
  - Feather River . . . 171
  - Merced River . . . 174
  - Old San Joaquin River . . . 172
  - Sacramento River . . . 170
  - San Joaquin River (Stockton to Vernalis, Delta Uplands) . . . 173
  - San Joaquin River (Vernalis to Fremont Ford) . . . 174
  - Stanislaus River . . . 175
  - Tom Paine Slough (Delta Uplands) . . . 173
  - Tuolumne River . . . 175
  - Yuba River . . . 171
- Return Flows, Relation to . . . 28, 48, 50, 51
- Seasonal, Comparative - 1939 through 1949
  - By months for Sacramento and San Joaquin River Systems . . . See "Diversions, Monthly"
  - For Sacramento River Sections . . . 120, 176
- Summary, Monthly, Sacramento-San Joaquin Valley . . . 48, 50

Page

DRAINAGE PLANT DISCHARGE
Recl. Dist. No. 70 Drain to Sacramento River 48, 73
Recl. Dist. No. 108 Drain to Sacramento River 48, 74
Recl. Dist. No. 787 Drain to Sacramento River 48, 74
Recl. Dist. No. 1000 (#3) Drain to Sacramento River 48, 87
Recl. Dist. No. 1000 (2nd Bannon) Drain to Sacramento River 48, 88
Recl. Dist. No. 1001 Drain to Cross Canal 48, 86
Recl. Dist. No. 1500 Drain to Sacramento Slough 48, 79

DRY CREEK (Tributary to Mokelumne River) - Stream Flow
near Ione 49, 93
near Galt 49, 94

DRY CREEK (Tributary to Tuolumne River)
Acreage Irrigated 165
Diversions 165
Stream Flow 112

DUTY OF WATER
Seasonal by Rivers - 1939 through 1949
Sacramento River and Tributaries 120
San Joaquin River and Tributaries 120
Water Utilization Summary 120

ELDER CREEK NEAR PASKENTA - Stream Flow 48, 65

ELK BAYOU ABOVE ELK BAYOU AVENUE - Stream Flow 51, 118

FEATHER RIVER
Accretions 48
Acreage Irrigated 52, 120, 139
Diversions 48, 120, 139, 171
Duty of Water 120
Stream Flow 48, 80, 81, 82

FRESNO SLOUGH BY-PASS
Acreage Irrigated 160
Diversions 160
Stream Flow 106

FRIANT RESERVOIR
Daily Content in Acre-Feet 99
Inflow in Daily Second-Feet 50, 99

GROSS DUTY OF WATER 120

INVENTORY OF MONTHLY STREAM FLOW
Sacramento Valley Streams 48
San Joaquin Valley Streams 50
Tule River and Tulare Lake Area 51

IRRIGATION DRAIN INTO ANTELOPE CREEK - Stream Flow 48, 64

KINGS RIVER BELOW EMPIRE WEIR #2 - Stream Flow 51, 118

KNIGHTS LANDING RIDGE CUT
Acreage Irrigated 52, 120, 135
Diversions 120, 135
Duty of Water 120
Stream Flow 48, 76

LAIRD SLOUGH - SAN JOAQUIN RIVER NEAR GRAYSON - Stream Flow 50, 103

LINDA CREEK NEAR ROSEVILLE - Stream Flow 48, 88

LITTLE DRY CREEK NEAR FRIANT - Stream Flow 50, 105

MERCED RIVER
Accretions 50
Acreage Irrigated 52, 120, 162
Diversions 50, 162, 174
Duty of Water 120
Stream Flow 50, 107, 108

MERCED RIVER SLOUGH - Stream Flow 50, 109

MILL CREEK - Stream Flow
near Los Molinos 48, 65
near Mouth 48, 66

MOKELUMNE RIVER
Acreage Irrigated 52, 142
Diversions 142
Stream Flow 50, 94, 95

MORMON SLOUGH
Accretions 51
Acreage Irrigated (Included with Calaveras River) 52, 143
Diversions (Included with Calaveras River) 143
Stream Flow 51, 98

ALPHABETICAL
INDEX TO TABLES (CONTINUED)

Page

NORMAL
- Precipitation . . . 34
- Runoff . . . 47

NORTH FORK OF MILL CREEK NEAR MOUTH - Stream Flow . . . 48, 66

OLD SAN JOAQUIN RIVER (Delta Uplands)
- Acreage Irrigated . . . 52, 120, 145
- Diversions . . . 120, 145, 172
- Duty of Water . . . 120

PRECIPITATION, Monthly at
- Colusa . . . 34
- Fresno . . . 34
- Marysville . . . 34
- Merced . . . 34
- Modesto . . . 34
- Red Bluff . . . 34
- Sacramento . . . 34

PUTAH CREEK - Stream Flow
- near Davis . . . 49, 91
- near Winters . . . 49, 91

RATING TABLES, Major River Gaging Stations . . . 52

RED BANK CREEK AT FOOTHILLS - Stream Flow . . . 48, 62

RELATION OF GAGE HEIGHT TO STREAM FLOW - 1949 . . . 52

RETURN WATER . . . See "Accretions"

RICE ACREAGE IN CALIFORNIA, 1924 through 1949 . . . 176

RUNOFF . . . See "Stream Flow"

SACRAMENTO RIVER
- Accretions . . . 28, 48
- Acreage Irrigated . . . 52, 120, 124
- Diversions . . . 120, 124, 170, 176
- Duty of Water . . . 120
- Stream Flow . . . 47, 48, 52 through 60

SACRAMENTO SLOUGH
- Diversions . . . See "Sutter By-Pass"
- Stream Flow . . . 48, 79

SALINITY INVESTIGATIONS
- Analyses, Complete or Partial by U. S. Bureau of Reclamation . . . 187
- Daily Salinity Observations . . . 185
- Delta Salinity . . . 179
- Description of Salinity Stations . . . 178
- Maximum Recorded Salinity, 1939 to 1949 . . . 177
- Relation of 10-day Flow to Affected Area . . . 186
- Salinity Observations in 1949 . . . 179

SAN JOAQUIN RIVER
- Accretions . . . 50
- Acreage Irrigated . . . 52, 120, 145, 147, 149, 150, 154
- Diversions . . . 120, 145, 147, 149, 150, 154, 172, 173
- Duty of Water . . . 120
- Stream Flow . . . 47, 50, 99 through 104

SHASTA RESERVOIR
- Daily Content in Acre-Feet . . . 53
- Inflow in Daily Second-Feet . . . 53

SOUTH FORK TULE RIVER NEAR SUCCESS - Stream Flow . . . 51, 116

SOUTH HONCUT CREEK AT LA PORTE ROAD - Stream Flow . . . 48, 83

STANISLAUS RIVER
- Accretions . . . 50
- Acreage Irrigated . . . 52, 120, 166
- Diversions . . . 120, 166, 173
- Duty of Water . . . 120
- Stream Flow . . . 47, 50, 113, 114, 115

STONY CREEK NEAR HAMILTON CITY - Stream Flow . . . 48, 70

STOCKTON DIVERTING CANAL AT STOCKTON - Stream Flow . . . 50, 98

STREAM FLOW
- Monthly Summary for all Streams . . . 48, 50, 51
- Average Minimum 10-day Flow to Delta . . . 186
- Comparative Monthly Water Supply . . . 48, 50, 51
- Daily Mean Second-Feet and Monthly Acre-Feet in
  - American River at Fair Oaks . . . 89
  - American River at Sacramento (H Street Bridge) . . . 89
  - Antelope Creek near Mouth . . . 64
  - Antelope Creek near Red Bluff . . . 63

ALPHABETICAL
INDEX TO TABLES (CONTINUED)

Page

STREAM FLOW (Continued)
Daily Mean Second-Feet and Monthly Acre-Feet (Continued)
Auburn Ravine at Highway 99-E 86
Battle Creek near Cottonwood 61
Bear River near Wheatland 85
Bear Creek near Lockeford 96
Bear Creek above San Joaquin River (near Stevinson) 106
Butler Slough near Mouth 63
Butte Creek near Chico 71
Butte Slough to Sacramento River 72
Butte Slough to Sutter By-Pass 78
Cache Creek near Capay 90
Cache Creek at Yolo 90
Calaveras River at
Bellota 97
Jenny Lind 96
Stockton (near) 97
Champlin Slough near Mouth 67
Chico Creek near Mouth 70
Chico Creek near Chico 69
Clear Creek near Igo. 60
Colusa Basin Drain at Knights Landing 76
Colusa Trough at Colusa-Williams Highway 75
Colusa Trough (Back Borrow Pit) near College City 75
Colusa Weir to Butte Basin 72
Coon Creek at Highway 99-E 85
Cosumnes River at McConnell 93
Cosumnes River at Michigan Bar 92
Cottonwood Creek near Friant 105
Cottonwood Creek near Cottonwood 61
Craig Creek near Mouth 62
Cross Creek below Lakelands Canal #2 119
Deer Creek near
Mouth 69
Vina 68
Smartville 84
Dry Creek near
Galt 94
Ione 93
Modesto (Clauss Road) 112
Elder Creek near Paskenta 65
Elk Bayou above Elk Bayou Avenue 118
Feather River at
Gridley (near) 80
Nicolaus 82
Oroville (near) 80
Shanghai Bend (below) 82
Yuba City. 81
Yuba River (below) 81
Fremont Weir to Yolo By-Pass 77
Fresno Slough By-Pass 106
Friant Reservoir Inflow 99
Irrigation Drain into Antelope Creek 64
Kings River below Empire Weir #2. 118
Knights Landing Ridge Cut 76
Linda Creek near Roseville 88
Little Dry Creek near Friant 105
Merced River at
Cressey 108
Exchequer (near) 107
Snelling (below) 107
Stevinson (near) 108
Merced River Slough 109
Mill Creek near Mouth 66
Mill Creek near Los Molinos 65
Mokelumne River at
Clements (near) 95
Lancha Plana 94
Woodbridge 95
Mormon Slough at Bellota 98
Moulton Weir to Butte Basin 71
North Fork of Mill Creek near Mouth 66
Putah Creek near Davis 91
Putah Creek near Winters 91
Recl. Dist. No. 70 Drain to Sacramento River 73
Recl. Dist. No. 108 Drain to Sacramento River 74
Recl. Dist. No. 787 Drain to Sacramento River 74
Recl. Dist. No. 1000 (#3) Drain to Sacramento River 87
Recl. Dist. No. 1000 (2nd Bannon) Drain to Sacramento River 88
Recl. Dist. No. 1001 Drain to Cross Canal 86
Recl. Dist. No. 1500 Drain to Sacramento Slough 79
Red Bank Creek at Foothills 62

ALPHABETICAL
INDEX TO TABLES (CONTINUED)

Page

STREAM FLOW (Continued)
Daily Mean Second-Feet and Monthly Acre-Feet (Continued)
Sacramento River at
Balls Ferry . . . 55
Butte City . . . 57
Colusa . . . 53
Hamilton City . . . 56
Keswick . . . 54
Knights Landing . . . 59
Ord Ferry . . . 57
Red Bluff (near) . . . 55
Redding . . . 54
Sacramento . . . 60
Verona . . . 59
Vina Bridge . . . 56
Wilkins Slough (below) . . . 58
Sacramento Slough to Sacramento River . . . 79
Sacramento Weir to Yolo By-Pass . . . 87
San Joaquin River at
Dos Palos (near) . . . 101
El Nido (near) . . . 102
Fremont Ford . . . 102
Friant (below) . . . 100
Grayson (Laird Slough) . . . 103
Hetch Hetchy Crossing . . . 104
Mendota (near) . . . 101
Newman (near) . . . 103
Vernalis (near) . . . 104
Whitehouse . . . 100
Shasta Reservoir Inflow . . . 53
South Fork Tule River near Success . . . 116
South Honcut Creek at La Porte Road . . . 83
Stanislaus River at
Melones Power House (below) . . . 113
Mouth (near) . . . 115
Orange Blossom Bridge . . . 113
Ripon Bridge . . . 114
Riverbank . . . 114
Stockton Diverting Canal at Stockton . . . 98
Stony Creek near Hamilton City . . . 70
Sycamore Slough at Knights Landing . . . 77
Thomes Creek at Paskenta . . . 67
Tisdale Weir to Sutter By-Pass . . . 73
Toomes Creek near Mouth . . . 68
Tule River at
Little Pioneer Ditch (above) . . . 117
Porterville (near) . . . 115
Turnbull Station . . . 117
Worth Bridge . . . 116
Tuolumne River at
Hickman Bridge . . . 111
La Grange . . . 110
La Grange Dam (above) . . . 109
Modesto . . . 111
Roberts Ferry Bridge . . . 110
Tuolumne City . . . 112
Wadsworth Canal to Sutter By-Pass . . . 78
West-Side Canal near Lost Hills (Main Drain at Hart's Station) . . . 119
Yolo By-Pass near Woodland . . . 92
Yuba River at Marysville . . . 84
Yuba River at Narrows Dam . . . 83
Flow Rating Table, Major River Gaging Stations . . . 52
Full Natural, Major streams to Central Valley . . . 47
Inventory of Monthly Flow . . . 48, 50, 51
Monthly Flow, Summary . . . 48, 50, 51

SUMMARY AND INVENTORY OF MONTHLY STREAM FLOW
Sacramento Valley Streams . . . 48
San Joaquin Valley Streams . . . 50
Tule River and Tulare Lake Area . . . 51

SUTTER BY-PASS AND SACRAMENTO SLOUGH
Accretions . . . 48
Acreage Irrigated . . . 52, 120, 137
Diversions . . . 120, 137
Duty of Water . . . 120
Stream Flow . . . 48, 78, 79

THOMES CREEK AT PASKENTA - Stream Flow . . . 48, 67

TOM PAINE SLOUGH (Delta Uplands)
Acreage Irrigated . . . 52, 120, 146
Diversions . . . 120, 146
Duty of Water . . . 120

TOOMES CREEK NEAR MOUTH - Stream Flow . . . 68

TULARE LAKE, MONTHLY INFLOW TO . . . 51

ALPHABETICAL
INDEX TO TABLES (CONTINUED)

Page

TULE RIVER
- Accretions . . . 51
- Acreage Irrigated . . . 168
- Diversions . . . 168
- Stream Flow . . . 51, 115, 116, 117

TUOLUMNE RIVER
- Accretions . . . 50
- Acreage Irrigated . . . 52, 120, 164
- Diversions . . . 50, 120, 164, 170, 175
- Duty of Water . . . 120
- Stream Flow . . . 47, 50, 109, 110, 111, 112

USE OF WATER . . . See "Duty of Water"

WADSWORTH CANAL
- Acreage Irrigated (Included with Sutter By-Pass) . . . 52, 120, 137
- Diversions (Included with Sutter By-Pass) . . . 120, 137
- Stream Flow . . . 48, 78

WATER ANALYSES . . . 187

WATER UTILIZATION, SUMMARY . . . 120

WEIRS, Daily Mean Flow Over, in Second Feet
- Colusa Weir to Butte Basin . . . 72
- Fremont Weir to Yolo By-Pass . . . 77
- Moulton Weir to Butte Basin . . . 71
- Sacramento Weir to Yolo By-Pass . . . 87
- Tisdale Weir to Sutter By-Pass . . . 73

WEST-SIDE CANAL NEAR LOST HILLS - Stream Flow . . . 51, 119

YOLO BY-PASS
- Acreage Irrigated . . . 52, 120, 135
- Diversions . . . 49, 120, 135
- Duty of Water . . . 120
- Stream Flow . . . 49, 76, 77, 92

YUBA RIVER
- Accretions . . . 48
- Acreage Irrigated . . . 52, 120, 140
- Diversions . . . 48, 120, 140, 171
- Duty of Water . . . 120
- Stream Flow . . . 47, 48, 83, 84

LIST OF PLATES

Plate		Page
1	Area Covered by Sacramento-San Joaquin Water Supervision	19
2	Shasta Reservoir Operation - 1949 and Friant Reservoir Operation - 1949	Opposite 24
3	Sacramento-San Joaquin Water Supervision (Showing location of Points of Diversion and Stream Gaging Stations)	In Back Pocket
4	Maximum Seasonal Salinity Encroachment and Salinity Observation Stations, Sacramento-San Joaquin Delta	41

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Valuable assistance has been rendered by many individuals and by many public and private agencies in the conduct of the field work and the preparation of data for this report of the Sacramento-San Joaquin Water Supervision activities.

Landowners, water users and the executives, engineers, managers and superintendents of various water organizations throughout the territory covered by this work have cooperated fully in furnishing the many and varied data requested.

The Pacific Gas and Electric Company and the Merced, Modesto, and Turlock irrigation districts have furnished a large number of electric power consumption records for use in the compilation of pumped diversions.

The United States Geological Survey, Department of Interior, has extended valuable cooperation in gathering and assembling stream-flow data.

The City of San Francisco Public Utilities Commission, Hetch Hetchy Water Supply, and the United States Bureau of Reclamation have made available a large amount of stream-flow data for the San Joaquin Valley.

The Modesto, Oakdale, and Turlock irrigation districts have assisted in observing and maintaining recording gages in the San Joaquin Valley area.

The United States Bureau of Reclamation provided the funds necessary to maintain the regular program of salinity observations in the Sacramento-San Joaquin Delta during 1949.

PERMANENT COMMITTEE OF THE SACRAMENTO-SAN JOAQUIN RIVER PROBLEMS CONFERENCE

In all former Sacramento-San Joaquin Water Supervision reports there has been an acknowledgment of the assistance rendered to the Water Supervision work by the Permanent Committee of the Sacramento-San Joaquin River Problems Conference. This committee, representing the water users and other interests involved, was appointed by the first Sacramento-San Joaquin River Problems Conference in January 1924. Its continued interest and cooperation, and assistance in seasons of critical water supply, have contributed in large measure to the successful prosecution of the Water Supervision work.

Since October 1, 1948, the Water Supervision work has been carried on under a cooperative agreement between the United States and the State Department of Public Works. This agreement specifies the work to be performed by the Division of Water Resources, and the costs to be borne respectively by the Division and the Bureau of Reclamation, in connection with the collection and compilation of stream flow and diversion data. Under these present conditions there has been no occasion to call upon the Permanent Committee for assistance or advice. It is desired, however, to acknowledge the past valuable services rendered and the advice given by this Permanent Committee. The following men served on the Committee continuously or part of the time since 1924:

Herbert E. White, Chairman

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In addition to the foregoing,
personnel of the Sacramento office of the U. S. Geological Survey
worked directly with and was assisted by the personnel of the
Division of Water Resources on stream-flow measurements and computations

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T. R. Merryweather
Administrative Assistant

FOREWORD

A contract was entered into between the United States and the Department of Public Works which provides for the performance by the Division of Water Resources of certain hydrographic work which has been formerly performed by the U. S. Bureau of Reclamation and the continuation of the Sacramento-San Joaquin Water Supervision activities of the Division of Water Resources. This contract, designated as U. S. Bureau of Reclamation Contract No. 175r-1596 and Division of Water Resources Contract No. 3-170, was executed on December 30, 1948 and became effective October 1, 1948.

The work performed during 1949 by the Division of Water Resources under this contract includes the collection of data on stream flows and diversions for the Sacramento and San Joaquin rivers and their tributaries formerly obtained by both agencies and in addition data formerly obtained by the Bureau of Reclamation on flows and diversions for the Tule River, measurements of inflows to Tulare Lake and quality and temperatures of water. In accordance with the terms of this contract, the Division transmitted to the Bureau of Reclamation periodic hydrographic reports for the latter's use in the operation of the Central Valley Project.

REPORT OF SACRAMENTO-SAN JOAQUIN WATER SUPERVISION FOR 1949

SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

Water supervision activities, resulting from the efforts of the first Sacramento-San Joaquin River Problems Conference and its Permanent Committee working with the former Division of Water Rights, were inaugurated in 1924. A complete description of the origin, history and conduct of the work is found in the 1924 and 1926 Biennial Reports of the former Division of Water Rights, in Bulletin Number 4 of that Division, and in Bulletin Number 23 of the succeeding Division of Water Resources. The latter bulletin brings together all data and measurements obtained in the first five-year period, 1924 to 1928, inclusive. Annual Water Supervision reports for subsequent years are in separately bound books similar to this report.

Objectives

At the outset, the objective of the work of Water Supervision in the valley floor areas along the Sacramento and San Joaquin river system was to afford relief to water users from the difficulties of obtaining irrigation supplies occasioned by uncoordinated diversions during years of substantially subnormal runoff. The situation called for a voluntary regulation of diversions in order to alleviate as far as possible the damage from the serious shortages in the water supplies needed for irrigation, municipal consumption, salinity control in the Sacramento-San Joaquin Delta, and navigation purposes. Equitable coordination of diversions was accomplished primarily through the Water Supervision program.

There is no agreement between the water users under which a watermaster might distribute the natural water supply equitably to those entitled to receive it, but it appears inevitable that such an agreement, embracing a definite schedule of relative water rights, will be developed. Its realization will require, however, reliable data, covering a long period of years, on the actual diversions and uses of water, stream flows, stream accretions and salinity encroachment into the Sacramento-San Joaquin Delta. Looking toward that end, it has been the objective of the Division of Water Resources through its Water Supervision work, to collect and record all of the basic hydrographic data necessary to formulate an intelligent and practicable agreement defining the respective water rights of the parties affected in the area covered.

Scope of Work

The area embraced by the Sacramento-San Joaquin Water Supervision work lies on the Sacramento and San Joaquin Valley floors. It specifically covers all of the lands irrigated from the Sacramento River between Redding and Sacramento, including those irrigated from the Colusa Trough, Back Borrow Pit, Knights Landing Ridge Cut, and Yolo By-Pass

above West Sacramento, from Lower Butte Creek and Butte Slough, from the Feather River below Oroville, from the Yuba River below Smartville, from the Bear River below Wheatland, from the Sutter By-Pass and Sacramento Slough, from the American River below Fair Oaks, from the Cosumnes River below Michigan Bar, from the Mokelumne River below Woodbridge, from the Calaveras River below Jenny Lind, from the San Joaquin River between Friant Dam and Mossdale Bridge, from the Merced River below Snelling, from the Tuolumne River below La Grange, from Dry Creek (tributary to Tuolumne River) below Oakdale-Waterford road, from the Stanislaus River below Knights Ferry, and from the Tule River below South Fork, and the irrigated areas lying on the "uplands" side of and receiving water from the San Joaquin River between Mossdale Bridge and Stockton, Old San Joaquin River and Tom Paine Slough. The area covered and its geographical relation to the Central Valley Drainage Basin are shown on Plate 1.

Water Supervision Activities

The work of the Sacramento-San Joaquin Water Supervision unit of the Division of Water Resources is divided into two portions, field work, mainly during the spring, summer and fall months, and office work during the winter and early spring months.

The field activities include:

(1) Measurement of stream flow passing the many recording stations along the river and drainage channels;

(2) Measurements of the amounts of water diverted and collection of records of use by each water user;

(3) Measurements of the amounts of water returned to natural channels, through drainage plants or gravity drains, for possible re-use;

(4) Obtaining an annual census of irrigated acreages and crops supplied by either a primary, or drainage water supply, or both;

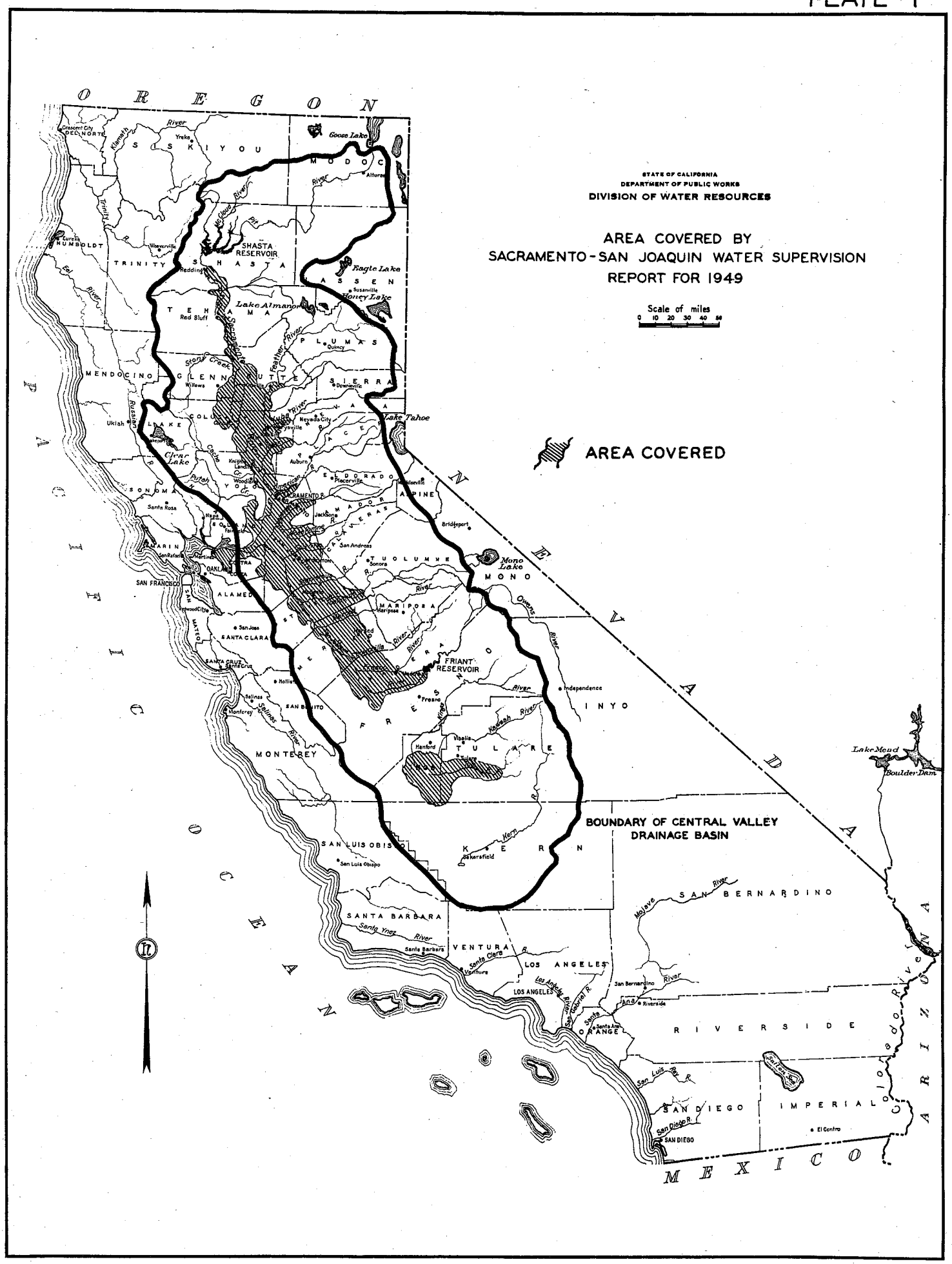
(5) Maintaining the Delta salinity observation program;

(6) Cooperation with and assistance to water users in connection with individual problems of diversion; and

(7) Assistance with hydrographic activities of cooperating public and private agencies.

The office work comprises mainly the assembly, computation and analysis of hydrographic and other data collected during the field season for presentation in the annual report of Water Supervision. This report contains the basic records of water supply available to, and the water utilization by, each user of water from the streams covered in the area. The computation of stream flow, drainage and accretions involves the conversion of the recorded daily gage records to figures showing the daily flows in second-feet and monthly runoffs in acre-feet. The computation of the amounts of water diverted by each water user involves the reduction of data showing the operation of his diversion plant, its electric power consumption, and its efficiency. The results of these computations are

PLATE I


STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
AREA COVERED BY
SACRAMENTO-SAN JOAQUIN WATER SUPERVISION
REPORT FOR 1949
Scale of miles
0 10 20 30 40 50
AREA COVERED
BOUNDARY OF CENTRAL VALLEY
DRAINAGE BASIN
OREGON
NEVADA
ARIZONA
MEXICO
PACIFIC OCEAN
SISKIYOU
MODOC
SHASTA
TRINITY
HUMBOLDT
TEHAMA
PLUMAS
MENDOCINO
GLENN
BUTTE
SIERRA
LAKE
COLUSA
NEVADA
PLACER
SONOMA
YOLO
EL DORADO
ALPINE
MARIN
SOLANO
SACRAMENTO
AMADOR
CALAVERAS
TUOLUMNE
MONO
ALAMEDA
SAN FRANCISCO
SAN MATEO
SANTA CLARA
MARIPOSA
MERCED
SANTA CRUZ
SAN BENITO
FRESNO
INYO
MONTEREY
TULARE
KERN
SAN LUIS OBISPO
SANTA BARBARA
VENTURA
LOS ANGELES
SAN BERNARDINO
ORANGE
RIVERSIDE
SAN DIEGO
IMPERIAL
Goose Lake
Eagle Lake
Honey Lake
Lake Almanor
Lake Tahoe
Clear Lake
Mono Lake
Lake Mead
Boulder Dam
Colorado River
SHASTA RESERVOIR
FRIANT RESERVOIR
Redding
Red Bluff
Willows
Ukiah
Santa Rosa
Napa
Fairfield
Oakland
San Francisco
San Jose
Santa Cruz
Hollister
Salinas
Monterey
Fresno
Hanford
Visalia
Tulare
Bakersfield
San Luis Obispo
Santa Barbara
Ventura
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
El Centro
Independence
Bridgeport
Placerville
Auburn
Nevada City
Sonora
Mariposa
Merced
Salton Sea

then compiled in the tabulations in this report for the purpose of giving basic records that are readily usable by all interested parties. The office work also includes the preparation of certain hydrographic data in form to be used as a guide in the ensuing season's field work.

In accordance with the provisions of Contract No. 3-170 between the Division of Water Resources and the U. S. Bureau of Reclamation, the Division has computed, on a preliminary basis, the daily mean flows at 36 stream-flow stations, and the diversions, by reaches, from the main streams and tributaries in the Sacramento and San Joaquin valleys and has transmitted the results of these computations monthly to the Regional headquarters of the Bureau of Reclamation.

The office work in connection with the program of observing Delta salinity conditions consists of collating the results of the chlorine tests from samples taken at four-day intervals at each observation station. These salinity records are presented each month in a bulletin which is distributed to governmental agencies and to many individuals and organizations that are interested in the results.

Hydrographic Activities of Cooperating Agencies

The United States Geological Survey, Water Resources Branch, through continued cooperative agreements with the Division of Water Resources, has maintained a series of stream gaging stations in the Sacramento and San Joaquin valleys. Some of the work of obtaining data from these stations is done by one of its engineers who works out of Sacramento, utilizing the office facilities of the Division of Water Resources. Certain of the stream-flow rating measurements and the office work of compiling the records have been conducted cooperatively by the Federal engineer and the State Water Supervision engineers.

The Modesto Irrigation District, the Oakdale Irrigation District, the South San Joaquin Irrigation District, and the Turlock Irrigation District in the San Joaquin Valley have cooperated with the Water Supervision engineers by assisting in the installation of certain recorder equipped stream gaging stations and are continuing to cooperate by operating the recording instruments at those stations.

The City of San Francisco Public Utilities Commission, Hetch Hetchy Water Supply, has continued to cooperate with the Water Supervision engineers by maintaining, operating and compiling records from a series of stream gaging stations on the San Joaquin and Tuolumne rivers in the San Joaquin Valley.

The United States Bureau of Reclamation, through its offices at Sacramento and Merced, cooperated by operating certain recorder equipped stations and by furnishing records of flow at certain stations.

The final computations of the diversion quantities, as shown in this report, are the result of giving full consideration to all measurements and records of operation during the entire season for each individual diversion.

The specific degree of cooperation by these agencies with the Water Supervision engineers is detailed in footnotes on the many stream-flow tabulations contained in this report.

SHASTA AND FRIANT RESERVOIR OPERATIONS

Shasta Reservoir on the Sacramento River above Redding was first used to store water for irrigation use during the winter of 1943-44 and releases for supplemental irrigation water along the Sacramento River commenced in the late spring of 1944. The release of water from the reservoir since 1944 has substantially changed the natural regimen of flow of the Sacramento River and in many respects greatly benefited conditions along that stream. However, it also has created added diversion problems.

Friant Reservoir on the San Joaquin River near Friant was first used to store water for irrigation use during the winter and spring of 1943-44 and the first releases for supplemental irrigation water occurred during 1944. Releases were made during 1949 for regulating and supplementing the irrigation supplies along the San Joaquin River.

The operations of the Shasta and Friant reservoirs are directed by the United States Bureau of Reclamation.

Reservoir Data

Shasta Reservoir is created by a gravity concrete dam, 528 feet high above streambed, located 13 miles upstream from Redding. The gross capacity of the reservoir with spillway gates closed is 4,500,000 acre-feet, of which a space of 4,000,000 acre-feet will be available for the active storage of water and 500,000 acre-feet of space will be reserved for silt deposits and to create head for the generation of power. The spillway steel drum gates were installed in 1948, thus providing a storage of 786,000 acre-feet above the 3,714,000 acre-feet at the fixed crest of the spillway. The ultimate storage capacity will be filled every year when the natural stream runoff from above the dam is equal to or exceeds the normal amount. Water from the reservoir is conveyed through the Sacramento Valley in the channel of the Sacramento River.

Friant Reservoir, on the San Joaquin River, is created by a gravity concrete dam about 275 feet high above streambed, and is located at the base of the foothills about 20 miles northeast of Fresno. The gross capacity of the reservoir with spillway gates closed, is 520,000 acre-feet, of which a space of 404,000 acre-feet between the top of the spillway gates at elevation 578 and the bottom of the Friant-Kern Canal outlet at elevation 459.4 feet will be available for the storage of water for flood control and to supply irrigation demands in the San Joaquin Valley. It is planned to ultimately convey the major portion of the water from Friant Reservoir through the Madera and Friant-Kern canals to lands north and south of the San Joaquin River in Madera, Fresno, Kings, Tulare and Kern counties. The spillway gates on Friant Dam were completely installed in 1948, thus providing a storage of 84,000 acre-feet above the 350,000 acre-feet of space between the fixed crest of the spillway at elevation 560 feet and the bottom of the Madera Canal outlets at elevation

442.2 feet. The Friant-Kern Canal was in course of construction during 1949, but some water was diverted through it for use north of and adjacent to Kaweah River, as shown in Table 162.

Shasta Reservoir Operation - 1949

The Shasta Reservoir has been constructed for multiple uses. It is designed to furnish water for (1) irrigation in the Sacramento and San Joaquin valleys, including the Sacramento-San Joaquin Delta area; (2) salinity control in the Delta by maintaining a flow in the lower Sacramento River sufficient to repel the intrusion of salt water from Suisun Bay; (3) navigation on the Sacramento River above Sacramento to Chico Landing; and (4) the generation of hydroelectric power. The reservoir will also be used to control floods in the Sacramento River originating above Shasta Dam.

Although the storage of water in the reservoir commenced in the early part of the winter of 1943-44, the ensuing season's subnormal runoff into it was not sufficient to fill the reservoir to the spillway lip. However, the United States Bureau of Reclamation was able to release sufficient stored water throughout the irrigation season of 1944 to augment the natural stream flows and thereby facilitate diversions of those natural flows by the diverters along the Sacramento River.

Since 1944, including 1949, the quantity of water in storage in Shasta Reservoir was sufficient to afford releases (1) to facilitate irrigation diversions by maintaining higher river levels along the Sacramento River, (2) to sustain minimum flow for navigation of approximately 5,000 second-feet upstream from Knights Landing, (3) to supplement irrigation supplies in the Delta area below Sacramento, and (4) to control salinity. During 1949, a year of 63 percent of normal runoff to the Delta, releases from the reservoir were regulated to maintain a stream flow out of the Delta into Suisun Bay sufficient to hold back the line of excess saline concentration to an arc embracing 10,100 acres of the lower Delta area.

The daily total mean-second-foot-flows into Shasta Reservoir during 1949 are given in Table 7. These inflows to the reservoir, as shown by the daily figures, represent the amounts of water that would have been flowing in the Sacramento River at the dam site if the dam had not been built. The inflow figures are computed by combining the effects of daily change in storage, reservoir evaporation, releases and spill.

A tabulation of the daily amounts of water in storage in Shasta Reservoir during 1949 is given in Table 8. The daily mean-second-foot-flows as measured below Shasta Dam at the United States Geological Survey station near Keswick are given in Table 9. The flows at the Keswick station are the same as the releases from Shasta Reservoir except for the amounts of inflow between the station and Shasta Dam. The amounts of this inflow are small during the irrigation season, and can be ignored, so that the flows at the gaging station can be assumed the same as the releases from the reservoir during that period.

A chart depicting the operation of Shasta Reservoir for 1949, as prepared by the U. S. Bureau of Reclamation, giving the inflows to the reservoir, the amounts released, the water surface elevations and the amounts of water in storage, is shown on Plate 2.

Friant Reservoir Operation - 1949

The Friant Reservoir will be used only for the storage of water for flood control and irrigation purposes. The daily total mean-second-foot inflows to Friant Reservoir during 1949 are given in Table 99. A tabulation of the daily amounts of water in storage in the reservoir during 1949 is given in Table 100. The daily mean-second-foot flows, as measured at the United States Geological Survey gaging station below Friant, are given in Table 101. These flows are the same as the releases from Friant Reservoir except for the amounts of inflow between the station and Friant Dam. The amounts of this intermediate inflow are small during the irrigation season so that the measured flows at the gaging station are practically the same as the releases from the reservoir during that period. A chart depicting the operation of Friant Reservoir for 1949, as prepared by the U. S. Bureau of Reclamation, giving the same data as are shown by the chart for Shasta Reservoir, is also shown on Plate 2.

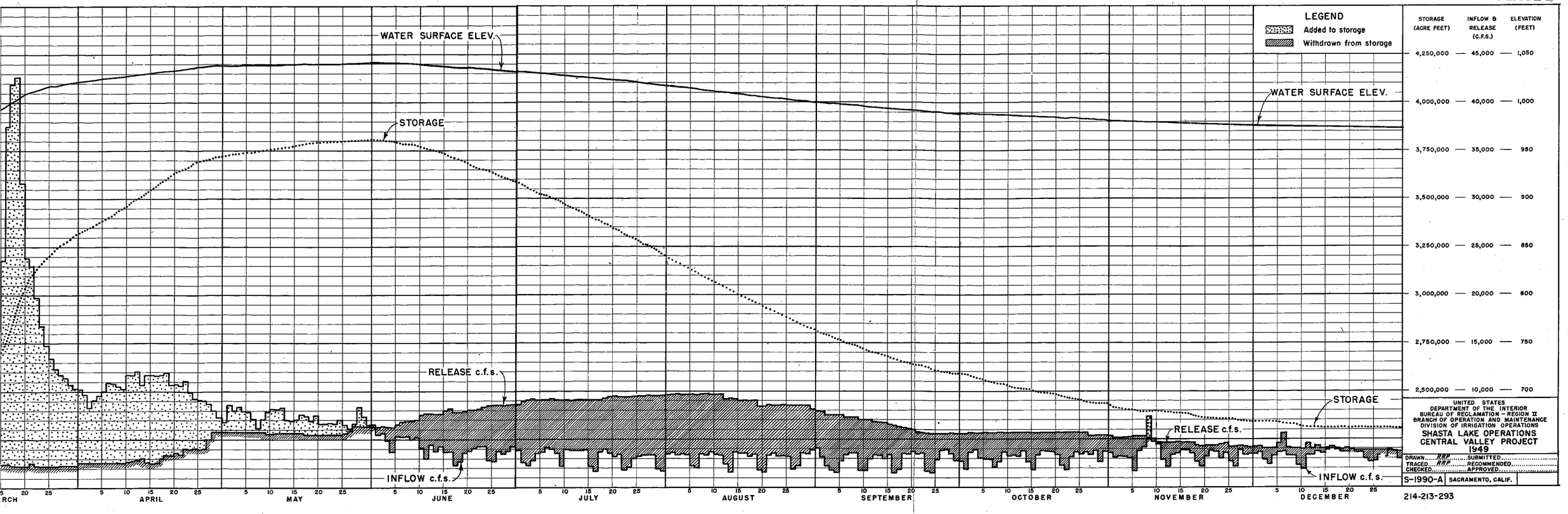
During the 1949 irrigation season, water stored in Friant Reservoir (Millerton Lake) was released into the Madera Canal, the Friant-Kern Canal, and into the channel of the San Joaquin River. Diversions by the Madera Canal served largely to aid in the replenishment of ground water supplies in the Madera area. The regulated releases flowing down the San Joaquin River served not only the irrigation requirements of the lands along that stream above the head of the Gravelly Ford Canal, but also the requirements of the numerous diversions below that point to Temple Slough.

RUNOFF AND WATER SUPPLY

The variable flows of the streams entering the Sacramento and San Joaquin valleys on the north and east sides result from the rainfall runoff occurring each winter and spring season principally from December to April, the snow melt runoff occurring during the spring and summer seasons from March through June, and a combination of runoff from perennial springs and released stored water during the summer and fall seasons. Flood flows in the valley floor channels are caused by runoffs from rainfall and melting snow in the mountain areas in excess of mountain reservoir capacities, and by rain storm runoff from the vast area of minor foothill watersheds and valley floor lands. Some incidental flood control is accomplished by reservoirs in many of the tributary watersheds including those of the Sacramento, Feather, Yuba, Stanislaus, Tuolumne, Merced and San Joaquin rivers. The extent of the flood flows in 1949 is given by the accompanying tabulations of daily stream flows.

During the summer irrigation season, variations in flow of the streams on the valley floor are affected, (1) by the combination of diversions from the streams for irri-

PLATE 2



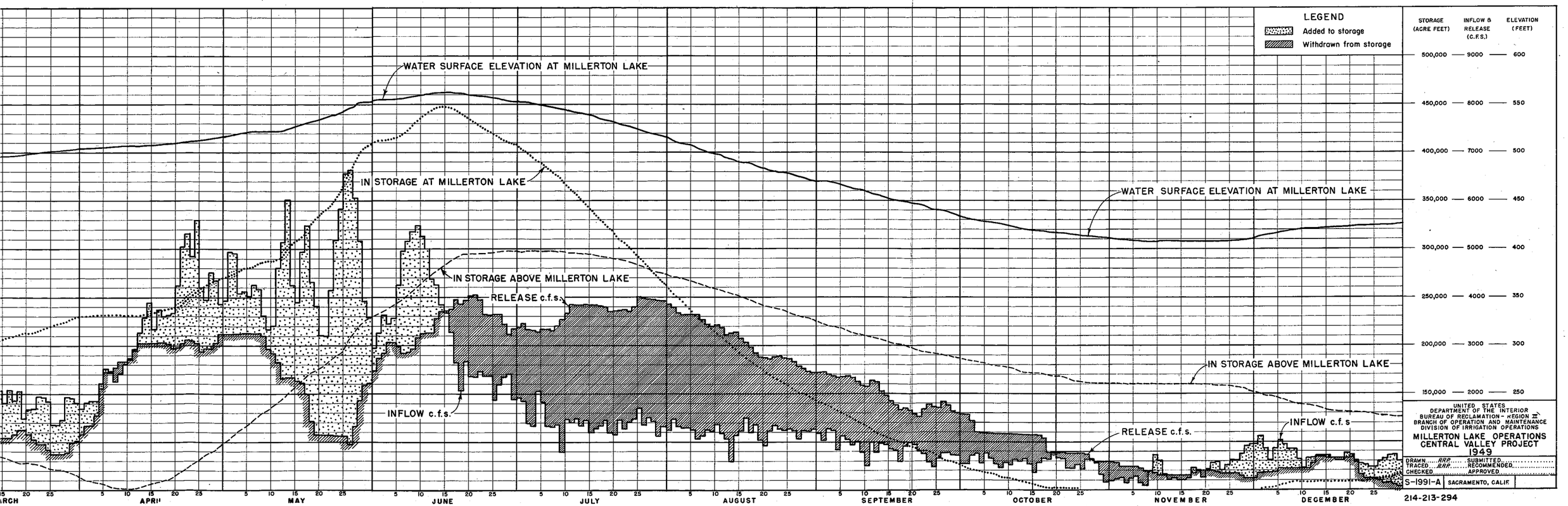
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION - REGION II
BRANCH OF OPERATION AND MAINTENANCE
DIVISION OF IRRIGATION OPERATIONS

SHASTA LAKE OPERATIONS
CENTRAL VALLEY PROJECT
1949

DRAWN ..... SUBMITTED .....
TRACED ..... RECOMMENDED .....
CHECKED ..... APPROVED .....

S-1990-A | SACRAMENTO, CALIF.

214-213-293



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION - REGION II
BRANCH OF OPERATION AND MAINTENANCE
DIVISION OF IRRIGATION OPERATIONS

MILLERTON LAKE OPERATIONS
CENTRAL VALLEY PROJECT
1949

DRAWN ..... SUBMITTED .....
TRACED ..... RECOMMENDED .....
CHECKED ..... APPROVED .....

S-1991-A | SACRAMENTO, CALIF.

214-213-294

ELEVATION (FEET)	INFLOW & RELEASE (C.F.S.)	STORAGE (ACRE FEET)
1,050	45,000	4,250,000
1,000	40,000	4,000,000
950	35,000	3,750,000
900	30,000	3,500,000
850	25,000	3,250,000
800	20,000	3,000,000
750	15,000	2,750,000
700	10,000	2,500,000
650	5,000	2,250,000

DISCHARGE	T. W. S. ELEVATION
3,000 C.F.S.	578
12,000	585
50,000	603
250,000	632.5

ELEV. 1065-CREST OF DRUM GATES (4,492,700 AC. FT.)
(NOT YET INSTALLED)

ELEV. 1037-CREST OF SPILLWAY (3,713,500 AC. FT.)

WATER SURFACE ELEV.

ELEV. 942 ℄ (1,748,400 AC. FT.)
6-102" OUTLETS

ELEV. 842 ℄ (602,300 AC. FT.)
8-102" OUTLETS

ELEV. 815 ℄ (420,300 AC. FT.)
POWER PENSTOCKS

ELEV. 742 ℄ (125,900 AC. FT.)
4-102" OUTLETS

ELEV. 586 ℄ TURBINES

INFLOW c.f.s.

RELEASE c.f.s.

STORAGE

WATER SURFACE ELEV.

STORAGE

RELEASE c.f.s.

INFLOW c.f.s.

5 10 15 20 25 JANUARY · FEBRUARY · MARCH · APRIL · MAY · JUNE · JULY · AUGUST · SEPTEMBER · OCTOB

ELEVATION (FEET)	INFLOW & RELEASE (C.F.S.)	STORAGE (ACRE FEET)
600	9000	500,000
550	8000	450,000
500	7000	400,000
450	6000	350,000
400	5000	300,000
350	4000	250,000
300	3000	200,000
250	2000	150,000
200	1000	100,000

⊗ OUTLETS IN-OPERATIVE

ELEV. 578 - CREST OF DRUM GATES (520,500 AC. FT.)

ELEV. 560 - CREST OF SPILLWAY (436,500 AC. FT.)

WATER SURFACE ELEV. AT MILLERTON LAKE

⊗⊗⊗⊗ ELEV. 464-℄ (125,630 AC. FT.)
4-110" FRIANT-KERN CANAL OUTLETS

○○ ELEV. 446-℄ (92,700 AC. FT.)
2-91" MADERA CANAL OUTLETS

○○⊗⊗ ELEV. 380-℄ (20,460 AC. FT.)
4-110" RIVER OUTLETS
TEMPORARILY 2-84" OUTLETS

IN STORAGE AT MILLERTON LAKE

IN STORAGE ABOVE MILLERTON LAKE

INFLOW c.f.s.

RELEASE c.f.s.

WATER SURFACE ELEVATION AT MILLERTON LAKE

IN STORAGE AT MILLERTON LAKE

IN STORAGE ABOVE MILLERTON LAKE

RELEASE c.f.s.

INFLOW c.f.s.

5 10 15 20 25 JANUARY · FEBRUARY · MARCH · APRIL · MAY · JUNE · JULY · AUGUST · SEPTEMBER · OCTO

gation and of accretions to the streams from both direct surface drainage and seepage from ground water, and (2) by releases of stored water for irrigation, navigation, salinity control and the generation of electric power.

1949 Inventory of Runoff

A comprehensive summary and inventory of the monthly stream flows, diversions and accretions, in acre-feet, is contained in Tables 2, 3 and 4. This inventory is arranged to give these data for each reach of each stream covered by Water Supervision work in a summarized ready-reference form. The inventory is designed to give a picture of the complete disposition of the season's water supply, with stress upon the amounts of losses or gains in flow along each reach of each stream.

1949 Runoff Comparisons

A comparison of the full natural runoffs in percent of a 50-year normal for the period 1920-1949, in the major streams tributary to the Sacramento and San Joaquin valleys is given in Table 1. As shown in that table, the 1949 natural runoff may be summarized as follows:

Stream and Station	Percentage of 50-year normal
Sacramento River at Red Bluff	69 percent
Sacramento River at Sacramento	63 percent
San Joaquin River at Friant	61 percent
San Joaquin River at Vernalis	61 percent
Sacramento and San Joaquin rivers flow to the Delta	63 percent

A comparison of the season's actual minimum flows is given in Table 189. The minimum 10-day-flows during 1949 are shown to have been:

Stream and Station	Average minimum 10-day-flow
Sacramento River at Sacramento	6,460 second-feet
San Joaquin River at Vernalis	452 second-feet
Combined Sacramento and San Joaquin rivers flow to the Delta	6,970 second-feet

---

It is apparent from these comparisons that the water supply available in the 1949 season was subnormal. Observations of water utilization and the amounts of residual flows in the streams reaching the Delta in 1949 indicated that the demands for irrigation and salinity control exceeded the natural flow supplies, and the releases of stored water from Shasta Reservoir were of primary importance in maintaining satisfactory river flows and fresh water conditions in the Delta.

Primary Irrigation Supplies

The flows onto the valley floor during the summer season through the major streams are considered to be the primary water supplies for irrigation. This primary water is differentiated from the flows available for irrigation in the lower reaches of the streams resulting from large accretions including the return of a substantial amount, through drainage, from the flows diverted for irrigation upstream. The amounts of primary water available for irrigation in the Sacramento Valley are given in the flow tabulations for those gaging stations located at the edge of the valley floor, to wit, tables numbered 9, 61, 68, 69, 79, 87 and 94.

In the San Joaquin River service area, primary water supplies are almost entirely diverted from the upper reaches of the Stanislaus, Tuolumne and Merced rivers by the large irrigation districts, and from the San Joaquin River in the vicinity of Mendota by the large canal companies. These upper diversions from the Stanislaus, Tuolumne and Merced rivers are included in Tables 167, 165 and 164, respectively. Primary water supplies in the San Joaquin River for irrigation below Friant are measured at the San Joaquin River gaging station below Friant, Table 101.

Accretions to Stream Flow

As evidenced by the data for stream flow and diversions, summarized in Tables 2, 3 and 4, there are large quantities of accretions to the flows of the streams and channels in their courses across the valley floors. These accretions are of major importance as available irrigation supplies. They are made up of measured flows from surface drains and of many other flows, not susceptible to direct measurement, from minor ephemeral streams, from scores of small surface drains, from seepage and return of percolated irrigation water and from escaping underground water normally present as the result of percolated rainfall on the valley floor. The amount of total accretion along any stream reach is the summation of amounts of measured drains plus unmeasured accretions, as shown in these tabulations.

During the summer season a large portion of the accrete water is derived from upstream irrigation returning to the streams either as surface drainage or waste into open drains or as deep percolation to the ground water from which it finds its way to nearby streams or drains.

Throughout the year, along certain reaches of the streams, the flows are augmented by outflows from seepage of the natural ground water. This portion of the ground water, which is independent of irrigation as a source, is replenished from two other sources, (1) rainfall on the valley floor, a portion of which percolates to the water table during periods of abundant precipitation, and (2) infiltration and escape from stream channels through the banks during high flood flow conditions, later to partially return to that stream when its water levels recede to low flow conditions of the summer and fall.

The figures shown in all reports prior to 1947, giving the relation of "return water in percent of diversion" as discussed under heading "Drainage and Return Water", may be misleading inasmuch as all accretions, heretofore referred to as "return water", actually may include substantial amounts of ground water seepage not derived from upstream irrigation and unmeasured contributions from small tributaries.

Sacramento Valley Accretions. In the Sacramento Valley all of the accretions to natural and regulated flows which are not diverted on lands north and west of the Sacramento Delta flow into the Delta and are available for use in that area. Practically all of the summer accrete flows in Colusa Trough, Back Borrow Pit, Knights Landing Ridge Cut, and Yolo By-Pass are mainly return waters derived from diversions from the Sacramento River. Since the Sacramento River is the main stream through the Sacramento Valley the accretions to that stream include substantial amounts of return water from irrigated areas served by water from other sources, particularly the Feather River. A large part of the summer return water flows reaching the Sacramento River through the Butte Slough Outfall Gates (Mile 84.0L) and from Sutter By-Pass through Sacramento Slough (Mile 21.2L) are of Feather River origin. However, the measured flows in Sacramento Slough, Table 60, include not only return water from Feather River diversions but also return water from Sacramento River diversions into Reclamation District No. 1500, Table 59. In Water Supervision reports prior to 1947 estimates are given showing that bank seepage into the West Borrow Pit of the Sutter By-Pass from R.D. 1500 amounts to 10 percent of that district's diversions from the Sacramento River.

Along the Sacramento River between Colusa and Red Bluff there are no large well defined artificial drainage channels. Records or estimates of natural inflow to the Sacramento River from streams in this stretch were, however, obtained where available. Above Red Bluff to Redding there is considerable drainage water from the Anderson-Cottonwood Irrigation District, but it is not recorded.

Along the Feather River, during years of subnormal water supply, practically all of the primary regulated water is diverted upstream from, or at, the Sutter-Butte diversion dam, yet accretions accumulate below that point in amounts sufficient to afford a limited supply for all diversions.

Table 2 is designed to give a summary not only of monthly flows measured on the Sacramento Valley floor but also the computed monthly amounts of accretions (or losses, as shown by a minus sign preceding the figure) occurring along each reach of each stream between gaging stations. At the end of each series of data for one stream, as shown in Table 2, there are summations of diversion and accretion quantities.

In order to compare 1949 season conditions along the Sacramento River with those of previous years, the following tabulation gives the seasonal accretions, July through September, in percent of simultaneous diversions. This tabulation, in part, is excerpted from Table 147 in the 1946 Water Supervision Report. The figures for 1947, 1948 and 1949 were derived from the summation data in Table 2 in each report, but under the same provisions detailed in the "note" under the 1946 Table 150.

Comparative Seasonal Accretion Percentages - 1938 - 1949

Sacramento River - Red Bluff to Sacramento

Year	Seasonal Runoff at Red Bluff in per cent of 50-year Normal	Accretions in per cent of Diversions* July through September
1938	168	64
1939	50	36
1940	120	40
1941	164	56
1942	129	56
1943	97	53
1944	53	49
1945	76	43
1946	92	51
1947	58	52
1948	87	62
1949	69	58

*Excludes City of Sacramento municipal.

It is apparent from the above tabulations that there are variations in the accretion percentages with relation to the seasonal runoffs. However, a definite trend in this relation indicates that summer accretions to stream flow on the Sacramento Valley floor are influenced not only by return water from irrigation but also by natural ground water seepage. Ground water seepage, as indicated by the above accretion ratio, is observed to be accelerated during those summer seasons which follow late and abundant spring rains on the valley floor.

San Joaquin Valley Accretions. The summer and fall season stream flows in the lower San Joaquin River and its tributaries on the valley floor consist mainly of accrete flows derived to a large extent, from irrigation water returning to the stream channels by way of percolation into the ground water and the latter's seepage into the channels. The exceptions to this condition are on the Tuolumne and Stanislaus rivers when irregular releases for power generation below upstream diversion points further augment the flows.

The channels of the Stanislaus, Tuolumne and Merced rivers in their westward flow across the valley floor from the foothills are in deep degraded canyons between more or less sheer bluffs rising from 10 to 50 feet to the predominant level of the upper plains of the valley floor. The plains areas are intensively irrigated with regulated gravity water supplies derived from the upper reaches of the same streams. Thus, an

abundant water supply in normal years, a deep and permeable soil and the deep river channels are all conducive to relatively steep slopes of the ground water table toward the rivers and the consequent high rate per mile of accretions to the stream flow.

The channel of the San Joaquin River between Friant and the valley trough near Mendota passes through the plains area in a deeply degraded canyon 10 feet to 100 feet deep between relatively sheer bluffs. The plains area along the south side of this reach is intensively irrigated with Kings River water through the Fresno Irrigation District distribution system. On the plains along the north side of this reach in Madera County irrigation water is derived mainly from ground water, except where occasional parcels are served with pumped river water. Because of the fact that the elevation of the ground water plane on the south side is above the riverbed and along the north side it is below the bed, there are accretions from the south and losses to the north along this reach of the San Joaquin River. The losses during the 1949 season exceed the accretions as shown in Table 3.

The Tule River debouches onto the valley floor in the vicinity of Porterville through a shallow meandering channel. The bed of the channel as it crosses the valley floor is made up of unconsolidated sediments with high permeability. This latter fact accounts for the heavy channel losses along Tule River as shown in Table 4.

The magnitude and importance of these accrete waters in the San Joaquin Valley as a water supply is brought out in Table 3. There does not appear to be as definite a relation of accretions with respect to diversions along these San Joaquin Valley streams as exists in the Sacramento Valley. This lack of a relation may be due, (1) to the considerable lag between the time diversions are made from the streams for storage in terminal reservoirs (Woodward, Dallas-Warner, and Owens) and the time a portion of those waters return to the stream channels after having been applied for irrigation, and (2) to the prevailing climatic effects upon rainfall, humidity, transpiration and evaporation.

The ratio of accretion (including return water from irrigation) to diversions along the lower San Joaquin River and its tributaries, Stanislaus, Tuolumne and Merced rivers, is considerably smaller than that for the Sacramento River. Analysis of pertinent data in Table 3 and comparison with the data contained in Table 147 of the 1946 Water Supervision report indicate this San Joaquin Valley ratio to vary between 19 and 35 percent while the foregoing table on page 28 shows the Sacramento Valley ratio to vary between 36 and 64 percent. This difference may be attributed to the fact that, whereas, due to basin topography and geology, practically all drainage from the Sacramento River diversions is quickly returned to the river, considerable of the return water in the San Joaquin Valley may never reach the surface streams because of its percolation to ground water and its immediate recovery by drainage and deep well pumps in the areas of many of the irrigation districts for re-use through the irrigation canals.

Stream Flow Measurements

Many of the stream gaging stations, the records from which are reported herein, are maintained, operated and rated, and the flows at them are computed, by agencies co-operating with the work of the Sacramento-San Joaquin Water Supervision. The methods used by all cooperating parties are standardized and the results obtained are equally good. In order to obtain uniformity, however, the Water Supervision engineers cooperate with the other agencies in obtaining and correlating the records for each of the cooperative stations.

During the 1949 season, 61 of the total of 134 gaging stations on streams and drainage channels for which records are reported herein were maintained, operated and rated, and the flows at them were computed, solely by the Division of Water Resources through the Water Supervision and Flood Control organizations.

An automatic water stage recorder is in operation at each of the gaging stations used in this work. The continuous records of water surface elevations at the stations serve two major purposes in the preparation of the data presented in this report. First, the actual water surface elevations at two adjacent stations on a stream afford the means of obtaining the water surface elevations at the pumping plants along the stream between those stations. These elevations give the pumping heads, which heads, in turn, become factors in determining the rates of diversion by the pumping plants. Second, the water surface elevation (gage height) is a factor in determining the flow of the stream, in second feet, passing the station.

A stream-flow rating is made for each gaging station. This rating gives the flows in second-feet for each gage height at the station. Normally this gage height-flow relation, or rating, is more or less permanent where there is a fixed channel and a fixed flow regimen at the station. The rating varies however where the bed of the channel is of loose shifting sand, or heavy weed growth accumulates as the season progresses, or where there may be backwater effects from downstream conditions. In this latter case more frequent measurements of flow are made to obtain accurate records of the flows passing the stations.

Water surface elevations at any time at certain gaging stations may be derived by the reader by using Table 6 coupled with the appropriate stream-flow data in Tables 9 through 140. From the stream flow table the flow on any desired day is interpolated into the specific station's rating table in Table 6 to give a gage height (or elevation) of the stream's water surface for that day.

Preliminary Data from Cooperating Agencies

Some of the stream-flow records submitted by cooperating agencies and included in this report must be considered "Preliminary Data" since this report is published prior to final preparation of the data for publication by those agencies. This condition is particularly true with respect to some data furnished by the U. S. Geological Survey.

Stream Flow Bulletins

During 1949, stream-flow bulletins were compiled from time to time and mailed to interested agencies and persons. The bulletins listed the results of stream-flow current meter measurements made along the Sacramento and San Joaquin river system on the valley floor by Division of Water Resources (Sacramento-San Joaquin Water Supervision) and U. S. Geological Survey engineers.

Notes on Certain Gaging Stations

Records are obtained and published in this report for 134 gaging stations in the Sacramento and San Joaquin valleys, including 38 stations not heretofore published in this series of reports. A brief description of each station is given at the bottom of the stream-flow data table. The location of each station is shown on Plate 3 in the pocket on the back cover of this report. Notes on the newly included stations, together with a repetition of notes on the Sacramento River at Sacramento, are believed desirable, however, for a better understanding of the records. These notes are as follows:

Sacramento River at Sacramento. The method of computing daily mean flows at this station, beginning with 1947, has been radically changed. Heretofore, as shown in reports prior to 1947, the low flows which are affected by tidal action, were derived from (1) the records of flows at Verona on the Sacramento River and at H Street Bridge on the American River and (2) records of diversions from and drainage to the rivers between those two upper stations and the I Street Bridge at Sacramento. The method previously used did not take into account unmeasured accretions or losses in the reach between Verona and I Street Bridge and in the American River below H Street.

The procedure employed in 1947 through 1949 involves the computation of daily mean Sacramento River flows passing Sacramento by the usual and standard practice of rating the stream, at the I Street Bridge station by means of the slope-velocity method. This method requires a consideration of the gate heights recorded at the river gaging station at Snodgrass Slough (20 miles downstream from Sacramento) as well as the recorded gage heights at Sacramento. The adaptation of this method in 1947 as a means of direct rating, was accepted after Water Supervision engineers had measured and studied the problem with this method in mind for the previous three years.

The final relation for tidal influenced flow conditions at Sacramento involves the construction of a rating curve having as the ordinate the difference between the gage heights at Sacramento and at Snodgrass Slough and as the abscissa a function of velocity (fV) equalling the discharge (Q) divided by the gage height at Sacramento. Flows, in second-feet, passing Sacramento are obtained from this relation by multiplying the scale value of fV for any differential gage height, by the corresponding gage height at the I Street recorder. This relation is used for gage heights at Sacramento below 10.5 feet (a flow of 33,000 second-feet) below which tidal fluctuations are effective.

The flows for gage heights below 10.5 feet follow the exponential relation

$$Q = 1426 \text{ (I Street recorder G.H. + 3.10)(Differential - 0.30)}^{.325}$$

where "Differential" =(I Street recorder G.H. + 3.10) minus (Snodgrass Slough G.H.).

The flows for gage heights above 10.5 feet follow the exponential relation

$$Q = 435 \text{ (I Street recorder G.H. + 7.40)}^{3/2}.$$

Tidal fluctuations cease above the 10.5-foot stage and this latter flow-stage relation exists.

Channel dredging activities by the U. S. Corps of Engineers in the vicinity of Sacramento during 1949 caused a slight shift in the flow-stage relationship, but frequent flow measurements, including tidal cycle measurements, made during the past three years delimit the above relationships.

Minor Tributaries to Sacramento River. Eleven stream-flow stations, installed by the U. S. Bureau of Reclamation, were acquired for operation and maintenance by the Division of Water Resources on October 1, 1948 under the terms of Contract No. 3-170. These stations are located on creeks tributary to the Sacramento River between Chico and Red Bluff, and with the exception of Red Bank Creek, are near enough to their respective mouths to record directly the inflow from the creeks to the river. Since it is the intent that most of these stations be used to record only flows during the irrigation season, no attempt is made to obtain a continuous record throughout the year, and the recorders are removed during the highwater season to prevent possible damage. The streams on which the eleven stations are located are: Red Bank Creek, Craig Creek, Butler Slough, Antelope Creek, Irrigation Drain into Antelope Creek, North Fork of Mill Creek, Mill Creek, Champlin Slough, Toomes Creek, Deer Creek, and Chico Creek. A brief station description may be found in the footnotes following the tabulation of daily mean flows for each of these stations.

Additional Stations Reported in 1949. The following stream-flow stations, for which data have not been heretofore published in the reports of the Sacramento-San Joaquin Water Supervision, are included in the 1949 report. These stations, numbering 38 in total, were included to provide runoff data for the minor stream systems. Fourteen of these stations are maintained and operated by the Division of Water Resources. The stations on the Tule River, and those which show inflow to the Tulare Lake area are reported in accordance with the provisions of Contract No. 3-170 between the Division and the Bureau of Reclamation. (See Foreword at the beginning of this text.)

Clear Creek near Igo

Antelope Creek near Red Bluff

Elder Creek near Paskenta

Mill Creek near Los Molinos

Thomes Creek at Paskenta

Deer Creek near Vina

Chico Creek near Chico
Butte Creek near Chico
Reclamation District 787 Drain
Feather River below Yuba River
South Honcut Creek at La Porte Road
Coon Creek at Highway 99E
Auburn Ravine at Highway 99E
Linda Creek near Roseville
Cache Creek near Capay
Putah Creek near Winters
Putah Creek near Davis
Dry Creek near Ione
Mokelumne River at Lancha Plana
Mokelumne River near Clements
Bear Creek near Lockeford
Calaveras River at Bellota
Calaveras River near Stockton
Mormon Slough at Bellota
Little Dry Creek near Friant
Bear Creek above San Joaquin River
Merced River at Exchequer
Tuolumne River above La Grange Dam
Stanislaus River below Melones Power House
Tule River near Porterville
South Fork Tule River near Success
Tule River at Worth Bridge
Tule River above Little Pioneer Ditch
Tule River at Turnbull Station
Elk Bayou above Elk Bayou Avenue
Kings River below Empire Weir #2
Cross Creek below Lakelands Canal #2
West-Side Canal near Lost Hills

A brief description of the location, the cooperative agency involved, the drainage area where applicable, and the period of record may be found in the footnotes under the respective table of flows for each of the stations listed.

Automatic Radio Stream Gage Transmission

For purposes of receiving immediate and current information on flood flows in the winter and spring, and the variations of summer water supplies at critical stations, the Division of Water Resources has maintained for many years a system of automatic radio

transmission of gage heights. The radio signals indicating the gage heights are received at Sacramento headquarters office of the Division through a permanent receiver, or at desired points in the valley through portable receivers. The stream gaging stations which are equipped with automatic radio gage height transmitters are, Sacramento River near Red Bluff, Sacramento River at Ord Ferry, Sacramento River at Colusa, Sacramento River at Fremont Weir, Feather River near Oroville, South Fork American River at Coloma, North Fork American River at Rattlesnake Bridge and San Joaquin River near Vernalis. The instantaneous stream-flow information thus received is not only of value to the Water Supervision and Flood Control work of the Division but it is relayed immediately to interested agencies including the United States Bureau of Reclamation, United States Weather Bureau, and United States Corps of Engineers, and made public daily through the press.

Precipitation

In the Central Valley of California direct precipitation is a negligible source of water supply for growing crops during the late spring, summer and fall seasons. During the early irrigating season, however, the attendant cooler temperatures and higher humidities of rain storms substantially reduce the demand for irrigation diversions, and are two of the main factors affecting the variations in demand in the same month from year to year.

The following tabulation gives the 1949 monthly total precipitation at representative valley floor rainfall stations and the monthly normals. Records are from U. S. Weather Bureau.

Station	Inches of Precipitation - 1949												
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Red Bluff - 1949	.39	1.77	8.33	.10	1.74	.00	T	.00	T	T	.94	.74	14.01
- normal	4.76	3.92	3.25	1.70	1.13	.47	.03	.05	.80	1.33	2.97	4.40	24.81
Colusa - 1949	1.52	1.16	5.69	.00	.94	.00	.04	T	.01	T	.66	1.32	11.34
- normal	3.24	2.96	2.14	1.08	.53	.27	.01	.01	.30	.66	1.65	3.25	16.10
*Marysville- 1949	1.31	2.05	6.54	.00	1.19	.00	T	.04	.02	.06	.56	1.55	13.32
- normal													19.97
Sacramento- 1949	1.47	1.91	4.15	T	.32	T	T	.01	.03	.14	1.10	1.90	11.03
- normal	3.72	3.02	2.57	1.51	.77	.15	T	.00	.38	.92	1.88	3.03	17.95
Modesto - 1949	1.03	1.06	2.87	.00	.69	.00	T	.01	T	T	.68	1.25	7.59
- normal	2.18	1.80	1.74	.91	.46	.12	.01	.01	.16	.52	1.19	1.97	11.07
Merced - 1949	1.22	1.51	2.88	.00	.44	T	T	T	.00	T	.94	1.77	8.76
- normal	2.30	1.91	1.87	1.01	.48	.11	.01	.02	.18	.49	1.17	1.80	11.35
Fresno - 1949	.60	.73	3.60	.01	.39	T	T	T	.00	T	.46	.78	6.57
- normal	1.73	1.43	1.58	.95	.44	.08	.01	.01	.21	.57	.93	1.45	9.39

*New station at D Street Bridge. Normal shown is for 1948 at old station.

It can be seen from these data that Central Valley floor precipitation averaged 66 percent of normal for the 1949 season.

USE OF WATER FOR IRRIGATION

The prevailing warm termperatures and a prolonged frost-free period during the summer season in the Sacramento and San Joaquin valleys favors the profitable production of wide variety of marketable crops in large quantities. The availability of irrigation water during the dry summer season affords continuous growing conditions necessary for the many crops.

The major irrigated crops in the Sacramento Valley include rice, alfalfa and clover, citrus and orchard fruits, nuts, grapes, hops, truck crops, and field crops; in the Delta area they include alfalfa, orchard fruits, corn and truck crops; and in the San Joaquin River and tributaries service area they include grapes, nuts, orchard fruits, cotton, alfalfa and clover, truck crops, corn, grain, flax and pasture.

Irrigation Diversions

Measurements and records of diversions in 1949 have included all of the points of diversion on the valley floor along the Sacramento River and its tributaries; along the Cosumnes, Mokelumne, and Calaveras rivers; along the upland banks of the delta channels of Old San Joaquin River, Tom Paine Slough and San Joaquin River; along the Stanislaus, Tuolumne and Merced rivers and Dry Creek tributary to Tuolumne River; along the San Joaquin River between Friant Dam and Durham Ferry Bridge (Vernalis); along Fresno Slough and Fresno Slough By-Pass; and along Tule River.

This report contains records of a total of 1011 points of diversion segregated to various sources as follows: Sacramento River 304, Colusa Trough (above Colusa-Williams Highway Crossing) 20, Back Borrow Pit (extension of Colusa Trough along back levees of Reclamation Districts 108 and 787) 36, Knights Landing Ridge Cut 11, Yolo By-Pass 12, Cache Slough 1, Lower Butte Creek and Butte Slough 31, Sutter By-Pass and Sacramento Slough 45, Feather River 39, Yuba River 13, Bear River 5, American River 29, Cosumnes River 19, Mokelumne River 7, Calaveras River (including Mormon Slough) 39, Tom Paine Slough 9, Old San Joaquin River 17, San Joaquin River (below Vernalis gaging station) 58, San Joaquin River (between Vernalis gaging station and Fremont Ford Bridge) 30, San Joaquin River (between Fremont Ford Bridge and Friant Dam) 114, Fresno Slough and Fresno Slough By-Pass 14, Merced River 77, Tuolumne River 28, Dry Creek (tributary to Tuolumne River) 11, Stanislaus River 32, and Tule River 10. The locations of these points of diversion are shown on Plate 3 in the pocket at the back of this report.

All of the diversions, except 54 by gravity, are accomplished by pumping. The records of diversion by gravity are obtained by means of canal ratings established by flow measurements. In the case of the pumping diversions there are a few instances where the records are obtained by means of canal ratings but, in the main, the records are obtained from a relation established between electric power consumption, static head and plant efficiency. This is made possible by the fact that nearly all of the pumping plants are electrically operated. The relation between water pumped and power input is determined

from current meter measurements of the discharge and the measured kilowatt input. At the larger pumping plants several measurements are made during each season. At the smaller plants a number of measurements are made initially to determine the ratings and thereafter measurements are made at intervals to discover any changes which may occur in the ratings. Due to intermittent operation of the smaller plants and the large area to be covered by the field engineers, it is not possible to make many discharge measurements at any one of them. However, it is believed that the rating, as initially determined, remains more or less constant and that over a period of time enough measurements are secured to determine any change in the rating. All rating measurements made by owners or cooperating agencies have been given full consideration in the final computations of the amounts of water diverted by each individual plant.

Prior to 1933 a daily diversion record for each plant was compiled. However, since that year, except for some of the larger plants, the monthly diversion records only are available. The diversions for 1949 have been computed on a monthly basis only, and the breakdown into daily records was not made. The monthly amounts of water diverted at the individual points of diversion along all of the streams covered by the Water Supervision work are given in Tables 142 through 168.

Prior to 1947 the monthly amounts of diversions in acre-feet by the large east-side irrigation districts from the Stanislaus, Tuolumne and Merced rivers were published annually in this series of Water Supervision reports and are found in the 1946 Table 154. The amounts of these diversions during 1949 are shown in Tables 164, 165 and 167. The amounts of these diversions during the 1947 season were omitted from the 1947 annual Water Supervision report but are included in the 1948 report in Table 139, specially prepared to supplement the 1947 report.

Fresno Slough and Fresno Slough By-Pass normally convey excess Kings River water flood flows into the San Joaquin River at a point above Mendota Dam, but during the irrigation season San Joaquin River water is backed up through those channels by the Mendota Dam to afford irrigation supplies to the James and Tranquillity irrigation districts and to certain other diverters. The diversion and irrigated acreage data for these streams shown in Tables 162 and 163 were furnished by the U. S. Bureau of Reclamation.

Table 147, diversions and irrigated acreage by Reclamation District No. 2068 from Cache Slough, is included in this report to continue a similar record commenced in 1948. The irrigated area in the District lies outside of the established boundary of the Delta shown on Plates 3 and 4 and can be classed as a "Delta Uplands" area. The purpose of including Table 147 in this 1949 report is to present as full a record as is available of the use of water in and from the Delta, in conjunction with the Delta crop survey data in Table 148 of the 1948 report. A Delta crop survey was not made for the 1949 season.

A seasonal summary of water utilization during the past ten years, 1940 through 1949, from the Sacramento River and its tributaries and the San Joaquin River and its tributaries is shown in Table 141. This table presents an overall picture of the water utilization in these areas.

In Table 169 there are shown the average monthly diversions in percent of the seasonal for the streams in the Sacramento and San Joaquin valleys. A summary of the monthly diversions from the Sacramento and San Joaquin valley streams for the ten-year period, 1940 through 1949, is given in Tables 170 through 180. Table 180 shows, for the Sacramento River only, the seasonal diversions and acreages irrigated for the period 1940 through 1949, segregated to the different river sections.

Irrigated Acreage

Toward the end of the irrigating season in 1948, as was done in previous years, a complete canvass was made of acreages irrigated from each of the points of diversion covered by the Water Supervision work. The irrigated acreages for all of the points of diversion on the streams on the Sacramento and San Joaquin valley floors were plotted on suitable maps and are retained on file in the office of the Division of Water Resources for record.

The area irrigated through each individual point of diversion along the streams covered in this work is given in Tables 142 to 168, inclusive. These tabulations and the associated summarizing tables do not include data on diversions and use of water in the Delta.

The following is a summary of the total acreage irrigated during 1949 in the area covered by the Water Supervision work as shown in Table 5. This tabulation, as noted in the footnotes of Table 5, does not include the acreage of the large east-side irrigation districts in the lower San Joaquin Valley. Detailed acreage tabulations of the totals shown below, as well as those of the large irrigation districts mentioned, may be found in Tables 141 through 168 of this report and in Table 148 (Delta Crop Survey) of the 1948 report.

Area	1949 Irrigated Acreage	
Sacramento Valley Floor above Sacramento	426,300	
San Joaquin Valley Floor above Delta	481,200	
Total area served by measured diversions		907,500
Sacramento-San Joaquin Delta (1948 crop survey)		
Cropped	371,800	
Water Consuming--not cropped	77,000	
Total Delta		448,800
Grand Total		1,356,300

Table 182 shows a comparison of the acreage of rice irrigated during the period 1924 through 1949 from the stream channels within the Sacramento and San Joaquin valleys which are covered by Water Supervision work, and the total acreage of rice in California irrigated from all sources as reported by the Federal-State Crop Reporting Service.

In view of the methods of farming, which usually employ rotation of crops with summer-fallow, it is probable that the acreage of land under irrigation facilities in the area covered by the Water Supervision activities exceeds 1,400,000 acres.

1948 Sacramento-San Joaquin Delta Crop Survey

A complete survey of the acreages of crops, including both irrigated and non-irrigated, in the Sacramento-San Joaquin Delta was made during November and December of 1948, as called for in the State-Federal contract described in the "Foreword" of this report. A crop survey of the Delta area was not made during 1949. The crop segregations were plotted on a series of suitable maps of the Delta islands which are on file with the Division of Water Resources. Similar surveys of the Delta area had been made previously, the last one in 1938. All of the 1948 Delta acreage data are tabulated in Table 148 to be found in the pocket on the back cover of the 1948 report. That table gives the acreage of each cultivated or uncultivated crop segregated as to tracts and islands.

The total water consuming area of the Delta is segregated for 1948 as follows:

Total irrigated cultivated crops, not including double- or inter-crops	371,800 acres
Total idle lands below 5.0 feet in elevation, including interior water surfaces	37,400 acres
Total exterior channel water surfaces	37,600 acres
Small islands (est.)	300 acres
Total brush and trees in exterior channels (est.)	1,700 acres
Total water consuming area, 1948	448,800 acres

These data are similar and are comparable to data in Table 77 of the 1938 Water Supervision report.

Use of Water in Delta

Previous Water Supervision annual reports have included considerable analyses of the utilization of water in the Sacramento-San Joaquin Delta. The work of Water Supervision does not cover the delta area to the extent of measuring flows in the numerous interconnected channels or quantities of water diverted for irrigation, but periodically, surveys have been made of crops and irrigated acreages. Special investigations of the Delta irrigation problems have been conducted and the results therefrom have been reported in previous reports.

In previous years, in which crop surveys were made, the total consumptive use of water has been segregated to show the use in each river delta. There was also shown a classification of the irrigated crops with respect to the peat and sedimentary soils on which they were produced.

Gross Duty of Water

The term "gross duty of water", as used in this report, is defined as being the total amount of water diverted to serve one acre of irrigated land. The gross duty for any particular period may be expressed as the amount of water diverted in acre-feet per acre irrigated, or, conversely stated, may be expressed as the number of acres irrigated per one second-foot average diversion rate. The gross duty of water does not include solely the net amount of water consumed by plants in their processes of transpiration and growth, but also includes all irrecoverable losses through evaporation and deep percolation, plus canal and conveyance losses, and those amounts of water which act as a necessary vehicle to carry irrigation heads across porous soils or to maintain fresh water ponds in the growing of rice and which return to some river or drainage channel, with little loss, to become available for re-use.

Gross duty of water figures for the individual stream channels covered by Water Supervision work are given for the Sacramento and San Joaquin valleys in Table 141.

SALINITY INVESTIGATIONS

The intrusion of salty water from San Francisco Bay into the channels of the Delta from which irrigation supplies are derived, is a matter of extreme importance and the Water Supervision work has included observations during 1949 of the saline content of the water at several stations throughout the Delta and upper San Francisco and Suisun Bay areas, with cooperation from the U. S. Bureau of Reclamation.

Purpose

The purpose of the salinity investigation, as outlined in previous reports, has been to record the occurrence and extent of salinity encroachment from San Francisco Bay, and to establish the relation between movement of salinity, stream flow to the Delta, and tidal action. As reported in Bulletin 27 of the Division of Water Resources, this relation was established for the conditions which obtained during the period of the special investigation for that bulletin and upon the basis of all data available at that time. Subsequent investigations, therefore, have been directed to the maintenance of an unbroken record of the salinity, tidal and stream flow variations, essential not only in the corroboration of the relation presently established, but as the basis for a check of possible modifications in the relation due to changes in channel and tidal conditions which may have taken place or will occur in the future. Also, during periods of low stream flow, the continuation of salinity sampling has been essential in keeping the Delta irrigators advised of conditions through periodic bulletins so that damage from the use of water of too high salt content might be averted. (Saline concentrations exceeding 100 parts of chlorine per 100,000 parts of water are toxic to the average plant and are objectionable for human consumption.)

During 1949 the continuous observations of salinity served as an important factor in determining the amounts of release from Shasta Reservoir as controlled by the U. S. Bureau of Reclamation.

Scope

The general scope of this investigation each season has been such as to insure that samples of water to be tested for salinity could be taken at regular intervals at a sufficient number of stations throughout the Delta and upper Bay region so that the advance and retreat of the salinity from early summer to late fall would be completely recorded. Plate 4 shows the limit of encroachment into the Delta of water having 100 parts of chlorine per 100,000 parts of water for the years 1931, 1938, 1943, 1944, 1945, 1946, 1947, 1948 and 1949. These certain years are chosen, first, to represent a range of runoff conditions prior to the commencement of releases from Shasta Reservoir, to wit, 30 percent of normal runoff during 1931, 170 percent of normal runoff during 1938, 114 percent of normal runoff during 1943, and second, to represent the consecutive years concurrent with those releases. The salinity encroachment lines for each of the years 1920 to 1944, inclusive, may be found on the Delta map in the 1944 annual Water Supervision report.

Due to curtailment of appropriations to the Division of Water Resources by the Legislature in the 1941-1942 budget, sampling for salinity at all stations in the Bay and Delta areas was stopped by the Division of Water Resources on July 15, 1941. Through cooperation of the Fontana Farms Company, the City of Antioch Water Department, the U. S. Bureau of Reclamation, the Dow Chemical Company at Pittsburg and the City of San Francisco, miscellaneous samples were taken during the 1943 season and the results of the analyses are presented in the 1943 report of Water Supervision. In that same report there are tabulated a large number of complete analyses of water from the channels of the Sacramento and San Joaquin valleys and the Delta as prepared by the U. S. Bureau of Reclamation.

A regular program of salinity sampling and testing was re-established early in 1944 as part of the activities of the Sacramento-San Joaquin Water Supervision, with the necessary funds therefor being provided by the U. S. Bureau of Reclamation. This regular program was continued throughout 1949. The records of water samples taken during 1949 from 36 active sampling stations are given in Tables 185 through 188. A description of the location of each of these stations is contained in Table 184.

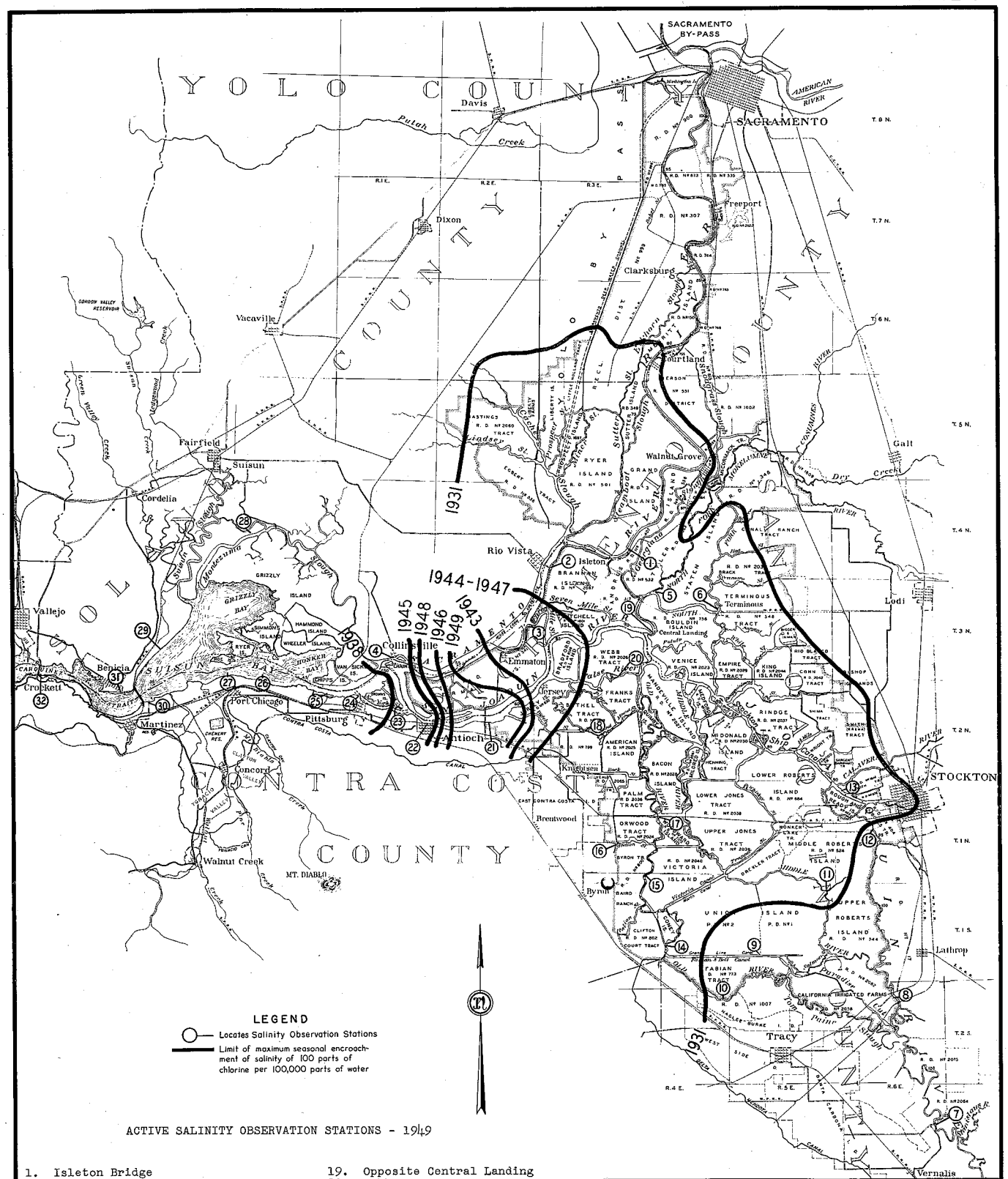
Complete or Partial Analyses of Surface Flows

As a matter of record there is included in this report a tabulation of the results of complete or partial chemical analyses of samples of water taken at many points along the Sacramento and San Joaquin rivers and in the Delta during 1949. These results are contained in Table 190 and are furnished entirely by the U. S. Bureau of Reclamation. The methods of collecting the samples and of analysis are definitely different from the methods employed in determining the chlorine component as part of the regular salinity observation activities in the Sacramento-San Joaquin Delta.

Sacramento River Water Moves Southward

With reference to Table 185, a study of the salinity concentrations in progressive months points out clearly that the freshening effect of Sacramento River water reaches far

PLATE 4



LEGEND

- Locates Salinity Observation Stations
- Limit of maximum seasonal encroachment of salinity of 100 parts of chlorine per 100,000 parts of water

ACTIVE SALINITY OBSERVATION STATIONS - 1949

1. Isleton Bridge
2. Rio Vista Bridge
3. Three Mile Slough
4. Collinsville
5. Southwest Point
6. Terminous
7. Vernalis
8. Mossdale Bridge
9. Grant Line Bridge
10. South Fabian
11. Williams Bridge
12. Garwood Bridge
13. Stockton Country Club
14. Clifton Court Ferry
15. Victoria
16. East Contra Costa I.D.
17. Orwood Bridge
18. Dutch Slough
19. Opposite Central Landing
20. Webb Pump
21. Millers Harbor
22. Antioch
23. Winter Island
24. Pittsburg
25. O & A Ferry
26. Nichols
27. Port Chicago
28. Innisfail Ferry
29. West Suisun
30. Martinez
31. Benicia
32. Crockett

Off Map. Grandview
Off Map. Point Davis
Off Map. Point Pinole
Off Map. Point Orient

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

LINES OF SALINITY ENCROACHMENT

SACRAMENTO - SAN JOAQUIN DELTA AND UPPER BAYS
1949

SCALE OF MILES
2 0 2 4 6 8 10

southward into the branching channels of the San Joaquin River. This condition may be expected when consideration is given to the relatively small amounts of inflow from the San Joaquin River. The more than 100,000 acres of upland and delta lands lying south of the latitude of Stockton require irrigation flows in excess of 1,000 second-feet during months of maximum use. During the months March through June in 1949, the inflows to this southern Delta area from the San Joaquin River were sufficient to meet this demand, and in consequence created a state of stagnation in the vicinity of Stockton. However, during the months of July, August and September, when the average inflow from the San Joaquin River dropped to approximately 600 second-feet, the point of stagnation in the main San Joaquin River channel moved southward, resulting in an upstream flow past Stockton of water derived from the Sacramento River with an estimated maximum daily flow of approximately 400 second-feet. Concurrent with this latter condition Sacramento River water transfused southward into the San Joaquin River portion of the Delta through Old River, Middle River and Whiskey Slough.

Station Maintenance and Records

The salinity sampling at all stations is done by local observers. Each observer is provided with a schedule showing the exact time for taking the samples, so that, throughout the Delta and upper bays all samples are taken at approximately one and one-half hours after the same high tide at four-day intervals. Table 184 gives the location and description of each active station from which samples were received during 1949. Location description of inactive stations are deleted in this report but can be found in previous reports.

The observers are furnished with stamped containers for the sample bottles so that the latter can be mailed, as filled, to the laboratory at Sacramento. All analyses of the water were made at the Materials and Research Laboratory of the Division of Highways in Sacramento during the 1949 season.

The maximum salinity as recorded at the stations in 1949 is shown in Table 183. For comparative purposes, this table shows also the maximum salinity recorded at these stations in previous years beginning with 1939. Only presently indicative and active stations are included in this comparison.

Daily Salinity Observations

In compliance with the desire of the U. S. Bureau of Reclamation to obtain daily observations of salinity in the Suisun Bay area arrangements were continued during 1949 for daily observations with the U. S. Maritime Commission, Reserve Fleet Division, for the West Suisun station and with the U. S. Navy, Marine Barracks, for the Port Chicago station. Special schedules of daily times for taking salinity samples were prepared for each of the two stations and complete and satisfactory cooperation by the two agencies was experienced through the year. The special results of the daily observations were transmitted immediately to the U. S. Bureau of Reclamation as received from the State Testing Laboratory. Results of daily salinity observations taken at Antioch are also included in the 1949 report, Table

188. These Antioch data were obtained from the City of Antioch by the U. S. Bureau of Reclamation and submitted for inclusion herein. The daily records at these three stations are given in Tables 186, 187 and 188. However, the regular four-day interval results of observations for the three stations, West Suisun, Port Chicago and Antioch, are included herein in Table 185 together with similar results for all other stations.

Salinity Bulletins

During 1949 a salinity bulletin was mailed each month to many cooperating agencies and individuals giving the results of samples taken and analyzed at four-day intervals at all stations. The figures given were the laboratory determination of the number of parts of chlorine per 100,000 parts of water.

Area of Salinity Encroachment

There is an apparent relation between the average stream flow to the Delta during the ten-day period of minimum flow and the area affected by salinity encroachment. Data amassed in this regard indicate that when the flow to the Delta drops below a certain amount the rate of advance of salinity encroachment greatly accelerates. A comparison of the average stream flows during the ten-day period of minimum flow and the affected acreage in the Delta is presented in Table 188. The area affected by salinity encroachment of 100 parts of chlorine per 100,000 parts of water amounted to approximately 10,100 acres in 1949.

TIDE GAGES

The 28 recording tide gages located on the Delta channels and on the upper bays were continued during 1949. Previous Water Supervision reports contained detailed descriptions and locations of the gages. The Flood Control branch of the Division of Water Resources operates and maintains 18 of these tide gages. The remaining 10 are operated by Federal agencies.

TABLES

TABLE 1

ANNUAL RUNOFF IN PERCENT OF 50 YEAR NORMAL(1)

SACRAMENTO-SAN JOAQUIN RIVER SYSTEM

	Sacramento and San Joaquin Rivers to Delta	Sacramento River at Red Bluff	Sacramento River at Sacramento	Feather River near Oroville	Yuba River at Smartville	American River at Fair Oaks	Mokelumne River at Mokelumne Hill	Stanislaus River below Melones	Tuolumne River near La Grange	Merced River at Exchequer	San Joaquin River below Friant	San Joaquin River near Vernalis
Mean Annual (1) Runoff Thous. Ac. Ft.	(2) 26977	8747	(2) 19342	4853	2490	2879	802	1273	1985	1069	1914	(2) 6241
1920	52	48	48	45	52	51	58	58	68	64	69	66
1921	118	131	126	124	127	111	109	99	102	95	84	95
1922	103	76	95	105	119	114	115	112	125	133	123	123
1923	76	61	70	63	83	96	88	89	90	88	87	88
1924	28	38	30	27	24	19	24	21	28	24	23	24
1925	86	92	84	65	85	94	104	96	97	85	75	88
1926	60	65	63	65	65	48	47	48	56	57	61	56
1927	121	125	127	121	142	127	112	107	103	101	105	104
1928	84	87	89	88	98	88	80	75	77	69	61	70
1929	44	50	44	38	41	40	43	41	49	46	46	46
1930	65	70	71	80	73	57	57	58	58	48	46	53
1931	30	38	32	30	26	25	26	25	30	25	25	27
1932	78	58	69	68	85	90	93	106	106	104	108	106
1933	48	52	46	39	43	44	53	48	56	48	58	54
1934	43	51	45	42	40	39	37	33	41	34	37	37
1935	91	86	87	88	90	90	88	95	106	110	101	103
1936	96	81	92	88	104	118	112	104	109	108	98	104
1937	80	68	70	65	75	81	87	87	101	114	115	105
1938	170	168	167	175	162	157	154	161	173	195	193	180
1939	43	50	43	39	36	36	43	41	46	45	49	46
1940	115	120	118	116	115	118	107	110	112	103	98	105
1941	137	164	143	133	129	109	105	105	126	136	137	127
1942	129	129	133	136	137	136	123	117	120	120	118	118
1943	114	97	111	115	126	135	125	123	120	121	108	117
1944	56	53	54	57	56	51	56	53	66	64	63	62
1945	86	76	79	77	88	88	97	100	106	103	112	106
1946	92	92	92	85	96	100	93	93	95	88	91	92
1947	54	58	54	52	55	49	49	50	55	53	59	55
1948	78	87	83	80	81	78	79	70	71	64	63	68
1949	63	69	63	53	60	64	65	58	63	59	61	61

(1) 50-year normal taken as 50-year (1889-1939) mean annual full natural runoff (Oct.-Sept. incl.).

(2) Summation of full natural runoff at foothill stations on major tributaries only, and does not include runoff from minor tributaries and from valley floor.

TABLE 2

SUMMARY AND INVENTORY OF MONTHLY STREAM FLOW - SACRAMENTO RIVER AND TRIBUTARIES - 1949

Item	Mileage	Record in Table No.	Quantities in Acre-Feet												Annual Total
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
SACRAMENTO RIVER															
INFLOW TO SHASTA RESERVOIR (Computed)		7	2180140	371460	1111290	611520	449830	247870	196240	186760	173160	190670	206500	206340	4199680
Change in Storage		8	-89100	+160100	+969600	+404500	+83700	-222400	-388000	-381300	-230800	-158600	-82700	-43000	+22000
Unmeasured Accretions			+2060	+3540	+45310	-2620	-10130	-7570	-6440	-1660	+4240	+7930	+6400	+9450	+50520
AT KESWICK	250.5	9	309200	214900	217000	204400	356000	462700	577800	566400	408200	357200	295600	258800	4228200
Diversions			145	147	150	12679	27977	28115	29542	28191	25807	25775	2529	160	181217
Unmeasured Accretions			-1755	+13347	+14350	-121	+17777	-8085	-9058	+3691	-6593	-18725	-5271	-1940	-2383
AT REDDING	240.7L	10	307300	228100	231200	191600	345800	426500	539200	541900	375800	312700	287800	256700	4044600
CLEAR CREEK Nr. Igo	237.1	22	4900	15770	122600	39180	15200	6820	2730	1570	1300	1590	2590	2890	217140
Diversions			0	0	0	39	88	207	363	234	124	28	0	0	1083
Unmeasured Accretions			+9400	+46330	+256800	+42159	+22088	+15287	-2567	-536	+13024	+5338	-4690	-9590	+393043
AT BALLS FERRY	224.5	11	321600	290200	610600	272900	383000	448400	539000	542700	390000	319600	285700	250000	4653700
COTTONWOOD CR. Nr. COTTONWOOD	222.2R	23	9090	23090	232100	62020	25940	10900	4090	2520	2540	3120	3550	3280	382240
BATTLE CREEK Nr. COTTONWOOD	221.5L	24	15880	15440	41000	27300	26550	15840	11010	10230	10140	11010	13060	14130	211640
Diversions			0	0	0	0	10	103	177	62	53	26	17	0	448
Unmeasured Accretions			+12630	+5570	+76000	-2020	-2180	-1537	+9877	+1262	-627	+24596	+17707	+20890	+162168
NEAR RED BLUFF	198.6	12	359200	334300	959700	360200	433300	473500	563800	556700	402000	358300	320000	288300	5409300
RED BANK CREEK Nr. FOOTHILLS	191.2R	25	NR	NR	NR	NR	262	0	0	0	0	0	0	NR	
CRAIG CREEK Nr. MOUTH	187.6L	26	NR	NR	NR	NR	678	25	86	123	7	6	NR	NR	
BUTLER SLOUGH Nr. MOUTH	185.0L	27	NR	NR	NR	NR	281	98	0	18	75	396	NR	NR	
*ANTELOPE CREEK Nr. RED BLUFF	180.7L	28	2690	4260	24820	6130	5370	2490	1770	1820	1760	1920	2140	2350	56520
ANTELOPE CREEK Nr. MOUTH	180.7L	29	NR	NR	NR	NR	430	137	116	100	75	87	61	54	
IRRIGATION DRAIN INTO ANTELOPE CR.	180.7L	30	NR	NR	NR	NR	268	391	102	33	154	115	NR	NR	
NORTH FORK MILL CREEK Nr. MOUTH	179.3L	33	NR	NR	NR	NR	566	173	42	36	85	218	100	74	
ELDER CREEK Nr. PASKENTA	178.5R	31	933	2100	28890	10650	4110	1160	304	100	42	93	316	377	49375
*MILL CREEK Nr. LOS MOLINOS	178.0L	32	7210	8700	28690	23440	21460	11410	6360	5440	5030	5420	5920	6140	135220
MILL CREEK Nr. MOUTH	178.0L	34	NR	NR	NR	NR	13060	3871	44	17	69	764	5589	6752	
THOMES CREEK AT PASKENTA	173.2R	35	3050	8430	37470	46990	18690	4650	690	194	59	148	1070	972	122413
CHAMPLIN SLOUGH Nr. MOUTH	171.0L	36	NR	NR	NR	NR	177	132	43	36	147	191	96	82	
TOOMES CREEK Nr. MOUTH	171.0L	37	NR	NR	NR	NR	292	0	0	0	0	265	NR	NR	
*DEER CREEK Nr. VINA	168.5L	38	6570	9020	37830	24620	13860	7490	5240	4850	4470	4780	5340	5220	129290
DEER CREEK Nr. MOUTH	168.5L	39	NR	NR	NR	NR	7593	NR	NR	NR	NR	NR	NR	NR	
Diversions			0	0	0	11	175	345	456	44	24	8	0	0	1063
Unmeasured Accretions			+30417	+21370	+237940	+67371	+38468	+33008	-13271	+10987	+9511	-12875	+5868	+6689	+435483
AT VINA BRIDGE	166.5	13	393600	366500	1264000	485200	518000	516800	551500	568300	412200	347700	333100	303300	6060200
Diversions			0	53	33	50496	128048	125553	135427	125563	73526	43617	22326	0	704642
Unmeasured Accretions			-2700	+2753	+28033	-204	-3052	-9947	+27127	-1237	+7426	+25517	+22926	+14900	+111542
AT HAMILTON CITY	149.5	14	390900	369200	1292000	434500	386900	381300	443200	441500	346100	329600	333700	318200	5467100
*CHICO CREEK Nr. CHICO	141.5L	40	2380	4800	25630	6550	2640	1670	1340	1200	1200	1280	1540	1760	51990
CHICO CREEK Nr. MOUTH	141.5L	41	NR	NR	NR	NR	1543	412	0	0	0	0	0	60	
[a]STONEY CREEK Nr. HAMILTON CITY	136.3R	42	0	1260	109000	6933	0	0	0	0	0	0	0	0	117193
Diversions			0	0	0	716	695	3235	5521	6176	2372	733	465	0	19913
Unmeasured Accretions			+9300	-360	+154000	+28483	+252	-2277	-6579	+4376	+1572	-11267	-15235	-11760	+150505
AT ORD FERRY	130.8	15	400200	370100	1555000	469200	388000	376200	431100	439700	345300	317600	318000	306500	5716900
Diversions			0	0	0	3999	9063	10052	13275	13846	3958	1730	132	474	56529
Unmeasured Accretions			+5400	+5900	-9000	+25199	+12163	+3752	+8775	+4146	+5258	+7030	+4132	+5574	+78329
AT BUTTE CITY	115.8L	16	405600	376000	1546000	490400	391100	369900	426600	430000	346600	322900	322000	311600	5738700
MOULTON WEIR	104.0L	44	0	0	11900	0	0	0	0	0	0	0	0	0	11900
COLUSA WEIR	92.4L	45	0	0	210800	0	0	0	0	0	0	0	0	0	210800
Diversions			0	0	15	7108	19076	18488	23353	21088	6176	1194	312	0	96810
Unmeasured Accretions			+6400	+5500	-54285	-6392	+14976	+6488	+653	+20488	+23276	+14294	+20612	+22100	+74110
AT COLUSA	89.4	17	412000	381500	1269000	476900	387000	357900	403900	429100	363700	336000	342300	333700	5493300
*BUTTE CREEK Nr. CHICO	84.6L	43	6800	10000	42840	32480	21500	10370	6890	6730	5120	5790	7000	6840	162360
BUTTE SLOUGH TO SACRAMENTO RIVER	84.0L	46	48940	39170	8283	22630	32770	17240	6688	15020	39870	3913	10210	2533	247267
R.D. 70 DRAIN	68.8L	47	246	111	1791	1742	2965	2329	3326	4721	3747	206	932	377	22493
TISDALE WEIR	64.2L	48	0	0	176800	0	0	0	0	0	0	0	0	0	176800
Diversions			0	0	4	46841	79012	78744	87213	77007	22445	5321	1274	0	397861
Unmeasured Accretions			-15986	-27081	+3730	+20369	+577	+5475	+15999	-7634	-33972	-15498	-13068	-15610	-82699
BELOW WILKINS SLOUGH	62.9	18	445200	393700	1106000	474800	344300	304200	342700	364500	350900	319300	339100	321000	5105700
R.D. 108 DRAIN	44.0R	49	2017	1260	6430	3239	22170	15600	16840	23520	16570	1180	756	692	110274
R.D. 787 DRAIN	37.0R	50	NR	NR	NR	NR	2591	10454	3129	4269	4066	346	0	173	
COLUSA BASIN DRAIN	34.15R	54	14530	5768	1726	18680	48530	21030	23330	46880	67120	32680	27240	5425	312939
SYCAMORE SLOUGH	34.15R	55	33	23	448	317	567	1333	1148	1174	323	74	25	17	5482
Diversions			0	0	0	22899	35496	36418	42218	37881	13007	1685	124	0	189728
Unmeasured Accretions			+5120	+5849	+53396	+28563	+3738	+8401	+871	-6762	+2128	+6205	+6303	+13593	+127405
AT KNIGHTS LANDING	34.0	19	466900	406600	1168000	502700	386400	324600	345800	395700	428100	358100	373300	340900	5497100
SACRAMENTO SLOUGH	21.2L	60	25460	5796	NR	46270	44280	35700	38930	50170	53670	12770	11070	9604	
FEATHER RIVER AT NICOLAUS	20.9L	66	179300	252800	859700	809700	533500	98060	13980	9230	27480	39430	83060	85110	2991290
COON CREEK AT HIGHWAY 99E	19.6L	72	2963	4350	16900	2467	1375	382	294	383	282	653	774	784	31607
AUBURN RAVINE AT HIGHWAY 99E	19.6L	73	3703	3564	11040	1632	4090	5207	5546	5641	2755	589	780	1171	45718
R.D. 1001 DRAIN	19.6L	74	196	210	2176	345	742	0	0	0	0	0	0	0	3669
FREMONT WEIR	23.0R	56	0	0	72420	0	0	0	0	0	0	0	0	0	72420
Diversions			0	0	143	8446	16131	11646	17119	16680	8053	645	0	231	82094
Unmeasured Accretions			-19122	-12220	+476747	-11668	+7144	-8403	-11971	-16944	-1034	-4497	-3184	-8638	+386210
AT VERONA	19.6L	20	659400	661100	2462000	1343000	961400	440900	375400	427500	503200	406400	465800	428700	9134800
R.D. 1000 (#3) DRAIN	6.85L	75	2780	2200	3096	1290	4200	1272	1037	3495	2598	2945	1638	1908	28459
R.D. 1000 (2nd Bannon Sl.) DRAIN	2.1L	77	0	0	5330	58	1648	129	0	906	5976	113	0	0	14160
LINDA CREEK Nr. ROSEVILLE	1.3L	78	NR	NR	NR	NR	NR	NR	NR	826	1176	1188	1646	2174	
AMERICAN RIVER AT SACRAMENTO	1.1L	80	63550	94000	368200	503600	531000	145600	23320	11440	10150	16340	34280	38360	1839840
SACRAMENTO WEIR	4.2R	76	0	0	0	0	0	0	0	0	0	0	0	0	0
Diversions			2130	1845	2044	14418	31083	36308	38530	36249	18916	4698	2951	3984	193196
Unmeasured Accretions			+25600	+22545	+13418	+59470	+96835	+55507	+65373	+47882	+6616	+20612	+4787	+9142	+427787
AT SACRAMENTO	0.4	21	749200	778000	2850000	1893000	1564000	607100	426600	455800	510800	442900	505200	476300	11258900
SHASTA RESERVOIR TO SACRAMENTO															
Total Unmeasured Accretions			+66764	+93043	+1296439	+248589	+198656	+90099	+78789	+58059	+30825	+48660	+47287	+54810	+2312020
Total Diversions			2275	2045	2389	167652	346854	352214	393194	363021	174461	85460	30130	4849	1924544
REVISED FIGURES FOR 1948 SACRAMENTO-SAN JOAQUIN WATER SUPERVISION REPORT - TABLE 2															
INFLOW TO SHASTA RESERVOIR - 1948[b]			742430	270590	530700	1132360	799600	511360	252950	205110	206300	214830	239520	267000	5372750
Change in Storage - 1948			+475700	+72600	+326200	+585200	-11000	-104200	-271400	-424500	-264600	-154900	-125600	-106200	-2700
Unmeasured Accretions - 1948			+12070	+3410	+15400	+30440	+13200	-2460	+50	-4210	-5200	-6430	-1520	+4100	+58850
AT KESWICK - 1948			278800	201400	219900	577600	823800	613100	524400	625400	465700	363300	363600	377300	5434300

NR No record.
* Not included in inventory or totals.
a Less diversions by Glenn-Colusa Irrigation District.
b Computed inflow.

TABLE 2 (CONT'D)

SUMMARY AND INVENTORY OF MONTHLY STREAM FLOW - SACRAMENTO RIVER AND TRIBUTARIES - 1949

Item	Mileage	Record in Table No.	Quantities in Acre-Feet												Annual Total
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
FEATHER RIVER															
NEAR OROVILLE	71.0	61	117500	152600	420900	561400	401300	148900	129100	119500	69570	64490	67860	67740	2320860
Diversions			0	0	0	54084	139402	129997	126387	116469	54480	45673	12494	9479	688465
Unmeasured Accretions			-9900	-16900	-25000	-23616	-11598	+2057	-351	+736	+1630	+2443	-1806	-1711	-84016
NEAR GRIDLEY	49.7	62	107600	135700	395900	483700	250300	20960	2362	3767	16720	21260	53560	56550	1548379
SOUTH HONCUT CREEK AT LA PORTE RD.	43.7L	67	1646	4623	16020	1470	795	117	NR	NR	NR	NR	NR	548	
Diversions			0	0	0	1775	1153	3211	4854	3508	846	49	8	0	15404
Unmeasured Accretions			+10554	+29977	+74980	+34405	+35358	+10424	+14282	+9662	+13186	+18079	+18188	+4172	+273267
AT YUBA CITY	28.0	63	119800	170300	486900	517800	285300	28290	11790	9921	29060	39290	71740	61270	1831461
YUBA RIVER AT MARYSVILLE	27.3L	70	43970	69380	247600	314200	240900	58200	8650	4130	3570	3170	15800	12610	1022180
Diversions			0	0	0	0	72	81	31	38	0	0	0	0	222
Unmeasured Accretions			+10830	+4420	+9900	-24600	+41572	+20491	+781	+2157	-90	-2230	-3510	+5380	+65101
BELOW SHANGHAI BEND	23.0	65	174600	244100	744400	807400	567700	106900	21190	16170	32540	40230	84030	79260	2918520
BEAR RIVER NEAR WHEATLAND	12.0L	71	12890	20060	93990	36090	11880	1530	126	115	385	658	2420	6070	186214
Diversions			0	0	0	1463	4528	6202	4213	4221	2955	1609	46	0	25237
Unmeasured Accretions			-8190	-11360	+21310	-32327	-41552	-4168	-3183	-2834	-2490	+151	-3344	-220	-88207
AT NICOLAUS	9.3	66	179300	252800	859700	809700	533500	98060	13920	9230	27480	39430	83060	85110	2991290
OROVILLE TO NICOLAUS															
Total Unmeasured Accretions			+3294	+6137	+81190	-46138	+23780	+28804	+11529	+9721	+12236	+18443	+9528	+7621	+166145
Total Diversions			0	0	0	57322	145155	139491	135485	124236	58281	47331	12548	9479	729328
AMERICAN RIVER															
AT FAIROAKS	19.2	79	66650	101300	363800	507000	517500	154700	22810	11310	9840	15200	35200	38600	1843910
Diversions			0	0	0	58	411	1221	1356	1204	723	200	176	359	5708
Unmeasured Accretions			-3100	-7300	+4400	-3342	+13911	-7879	+1866	+1334	+1033	+1340	-744	+119	+1638
AT SACRAMENTO	6.1	80	63550	94000	368200	503600	531000	145600	23320	11440	10150	16340	34280	38360	1839840
SUTTER BY-PASS															
BUTTE SLOUGH TO SUTTER BY-PASS	29.4	57	4280	3846	283300	14940	8991	8600	10260	11150	5319	2078	2340	4610	359714
WADSWORTH CANAL	25.7L	58	1448	1252	8612	2638	9781	6139	4788	7252	10020	5476	2277	716	60399
TISDALE WEIR	18.9R	48	0	0	176800	0	0	0	0	0	0	0	0	0	176800
R.D. 1500 DRAIN	0.0R	59	3373	2011	13260	7607	25690	26060	29460	27770	24930	4512	2289	1211	168176
Diversions			0	0	0	6376	15686	14769	14881	16999	5786	267	88	53	74905
Unmeasured Accretions			+16359	-1313		+27461	+15504	+9670	+9303	+20997	+19187	+971	+4252	+3117	
SACRAMENTO SLOUGH	-1.0	60	25460	5796	NR	46270	44280	35700	38930	50170	53670	12770	11070	9604	
BACK BORROW PIT															
COLUSA TROUGH AT COLUSA-WILLIAMS HWY.	37.0	51	11310	4818	110500	17580	54990	32140	35770	52670	54240	17200	17140	4925	413283
Diversions			0	0	0	547	8392	8126	9511	8290	3381	1413	1360	134	41154
Unmeasured Accretions			+950	+531	+21300	+3517	+11812	+8466	+8221	+10470	+14651	+6043	+7540	+447	+93948
COLUSA TROUGH AT COLLEGE CITY	22.7	52	12260	5349	131800	20550	58410	32180	34480	54850	65510	21830	23320	5238	465777
KNIGHTS LANDING RIDGE CUT	0.4R	53	33	36	127300	9967	2188	2311	2912	2686	1294	0	0	0	148727
Diversions			0	0	0	2039	7899	6461	4623	6888	1633	3	0	522	30068
Unmeasured Accretions			+2303	+455	-2774	+10136	+207	-2378	-3615	+1604	+4537	+10853	+3920	+709	+25957
COLUSA BASIN DRAIN	0.0	54	14530	5768	1726	18680	48530	21030	23330	46880	67120	32680	27240	5425	312939
HIGHWAY 20 TO OUTFALL GATES															
Total Unmeasured Accretions			+3253	+986	+18526	+13653	+12019	+6088	+4606	+12074	+19188	+16896	+11460	+1156	+119905
Total Diversions			0	0	0	2586	16291	14887	14134	15178	5014	1416	1360	656	71522
YOLO BY-PASS															
FREMONT WEIR	13.0	56	0	0	72420	0	0	0	0	0	0	0	0	0	72420
KNIGHTS LANDING RIDGE CUT	10.1R	53	33	36	127300	9967	2188	2311	2912	2686	1294	0	0	0	148727
*CACHE CREEK NEAR CAPAY	7.0R	81	6140	14770	85960	13480	22970	25460	23750	21610	10940	1700	703	1410	228893
CACHE CREEK AT YOLO	7.0R	82	0	8890	76500	5100	0	0	0	0	0	0	0	0	90490
Diversions			0	0	0	342	1661	3689	1937	2928	1771	0	0	0	12328
Unmeasured Accretions			+2047	-5846	-40020	-7135	+2013	+3158	+1375	+2752	+4627	+1010	+293	+532	-35194
YOLO BY-PASS Nr. WOODLAND	0.0	85	2080	3080	236200	7590	2540	1780	2350	2510	4150	1010	293	532	264115
YUBA RIVER															
YUBA RIVER AT NARROWS DAM		68	38480	50990	191800	291200	263000	74630	28730	23120	16860	14720	22280	16660	1032470
DEER CREEK NEAR SMARTSVILLE		69	2700	8260	24690	8230	789	383	117	116	95	129	753	1140	47402
Diversions			0	0	0	9062	18933	17288	19416	17890	13338	10920	4737	4389	115973
Unmeasured Accretions			+2790	+10130	+31110	+23832	-3956	+475	-781	-1216	-47	-759	-2496	-801	+58281
YUBA RIVER AT MARYSVILLE	0.9	70	43970	69380	247600	314200	240900	58200	8650	4130	3570	3170	15800	12610	1022180
DELTA TRIBUTARIES															
*PUTAH CREEK Nr. WINTERS		83	10000	36480	120200	12310	4010	592	253	197	198	165	393	1500	186298
PUTAH CREEK Nr. DAVIS		84	9220	33680	124900	12110	2980	43	0	0	0	0	0	0	182933
COSUMNES RIVER AT McCONNELL		87	9510	18090	121200	64060	42290	10050	561	0	0	0	2250	2330	270341
*DRY CREEK Nr. IONE (Forni Ranch)		88	2628	7002	28980	3306	381	NR	NR	NR	NR	NR	NR	NR	
DRY CREEK Nr. GALT		89	1980	5630	40410	3420	204	0	0	0	0	0	0	0	51644
*MOKELUMNE RIVER AT LANCHA PLANA		90	9500	9130	35670	67410	55730	64710	29350	25980	26340	26720	27660	28180	406380
*MOKELUMNE RIVER AT CLEMENTS		91	9560	9160	36890	68430	55650	65700	30450	25850	26310	27100	27410	28440	410950
MOKELUMNE RIVER AT WOODBRIDGE		92	10600	8790	36810	49550	29110	38600	4060	2450	6760	13190	21260	27080	248260
BEAR CREEK Nr. LOCKEFORD		93	0	97	3530	25	1	1	1	0	0	0	0	0	3655
CALAVERAS RIVER Nr. STOCKTON		96	32	459	2347	366	482	62	1	0	0	0	0	0	3749
STOCKTON DIVERTING CANAL AT STOCKTON		98	1670	5020	44200	3840	91	5320	43	0	0	0	0	0	60184
SACRAMENTO RIVER AT SACRAMENTO		21	749200	778000	2850000	1893000	1564000	607100	426600	455800	510800	442900	505200	476300	11258900
YOLO BY-PASS Nr. WOODLAND		85	2080	3080	236200	7590	2540	1780	2350	2510	4150	1010	293	532	264115
SAN JOAQUIN RIVER Nr. VERNALIS		110	107000	78590	213300	122400	217000	119200	34590	37020	42520	77920	94120	96600	1240260
Total Measured Flow to Delta			891292	931436	3672897	2156361	1858698	782156	468206	497780	564230	535020	623123	602842	13584041
REVISED FIGURES FOR 1948 SACRAMENTO-SAN JOAQUIN WATER SUPERVISION REPORT - TABLE 2															
FREMONT WEIR - 1948			0	0	0	329800	233600	0	0	0	0	0	0	0	563400
KNIGHTS LANDING RIDGE CUT - 1948			2083	0	6440	34680	28020	47100	83	286	266	0	0	47	119005
CACHE CREEK AT YOLO - 1948			1380	0	4460	26910	3990	0	0	0	0	0	0	0	36740
Diversions - 1948			0	0	0	0	106	290	916	875	863	190	0	0	3240
Unmeasured Accretions - 1948			-1043	+4730	-5690	-235490	-179024	-3990	+2563	+2219	+2017	+1042	+389	+693	-411584
YOLO BY-PASS Nr. WOODLAND - 1948			2420	4730	5210	155900	86480	42820	1730	1630	1420	852	389	740	304321

NR No record.
* Not included in inventory or totals.

TABLE 3

SUMMARY AND INVENTORY OF MONTHLY STREAM FLOW - SAN JOAQUIN RIVER AND TRIBUTARIES - 1949

Item	Mileage	Record in Table No.	Quantities in Acre-Feet											Annual Total
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
SAN JOAQUIN RIVER															
INFLOW TO FRIANT RESERVOIR (Computed)[a]		99	36073	43107	102589	200465	278677	200107	86735	74773	53938	34463	24391	44259	1179517
Change in Storage		100	+23300	+4400	+44200	+41100	+139400	-3900	-143100	-120000	-67800	-28100	+1500	+17500	-91500
COTTONWOOD CREEK Nr. FRIANT	269.53R	111	0	0	26	3	0	0	0	0	0	0	1	1	30
MADERA CANAL			0	0	1216	9646	12478	24960	41131	40294	21483	0	0	0	151508
FRIANT-KERN CANAL			0	0	1260	1281	0	454	16397	22691	3035	0	0	0	45118
Diversions			0	0	0	3	47	30	75	12	0	0	0	11	178
Unmeasured Accretions			-193	-447	-669	-1438	-2552	-4363	-3732	-2776	-1320	-523	-221	-119	-18353
BELOW FRIANT	268.13	101	12580	38260	55210	147000	124200	174200	168200	129000	95900	62040	22670	26630	1055890
LITTLE DRY CREEK Nr. FRIANT	264.0L	112	5	6	364	44	0	14	0	0	0	0	0	0	433
Diversions			27	6	51	1770	2769	4739	5332	4262	3567	1329	493	160	24505
Unmeasured Accretions			-669	-3648	+455	-13990	-4093	-12721	-15754	-10907	-10912	-342	-1650	-131	-74362
AT WHITEHOUSE	219.83	102	11889	34612	55978	131284	117338	156754	147114	113831	81421	60369	20527	26339	957456
FRESNO SLOUGH BY-PASS	208.9L	113	0	0	0	0	444	1	0	0	0	0	0	0	445
Diversions			8009	27412	37402	101796	94207	113813	113826	81546	57840	53054	18052	18280	725237
Unmeasured Accretions			+430	-3720	-7406	-12408	-9525	-23382	-13188	-14575	-10051	-875	+235	-1729	-96194
NEAR MENDOTA	206.2	103	4310	3480	11170	17080	14050	19560	20100	17710	13530	6440	2710	6330	136470
Diversions			323	3794	11863	17224	15965	19220	20538	17494	13500	6623	2985	6885	136414
Unmeasured Accretions			+793	+411	+774	+309	+2161	-98	+573	-124	+29	+199	+293	+700	+6020
NEAR DOS PALOS	186.0	104	4780	97	81	165	246	242	135	92	59	16	18	145	6076
*NEAR EL NIDO	168.0	105	1410	24	55	3	23	0	NR	NR	NR	NR	NR	NR	
BEAR CREEK ABOVE SAN JOAQUIN RIVER	140.5R	114	4477	3681	15079	1628	4925	1353	688	966	2329	292	466	565	36449
Diversions			0	0	76	0	65	118	134	155	7	7	10	7	579
Unmeasured Accretions			+683	+4062	+6526	+8857	+11874	+7273	+3801	+3227	+3029	+1459	+2026	+2377	+55194
AT FREMONT FORD	129.5	106	9940	7840	21610	10650	16980	8750	4490	4130	5410	1760	2500	3080	97140
MERCED RIVER Nr. STEVINSON	123.75R	118	9480	8960	36370	17740	24940	38960	9220	11420	10460	8240	7920	9060	192770
Diversions			0	1	0	373	396	414	542	451	363	241	78	3	2862
Unmeasured Accretions			+2440	+3031	+1780	+1183	-2634	+2534	+1392	+481	+163	+801	+658	+313	+12142
NEAR NEWMAN	123.7	107	21860	19830	59760	29200	38890	49830	14560	15580	15670	10560	11000	12450	299190
MERCED RIVER SLOUGH	122.2	119	0	0	30	1	803	734	0	0	0	0	0	0	1568
Diversions			7	197	2	10663	10257	10498	12147	8806	6928	1191	59	9	60764
Unmeasured Accretions			+3545	+3098	+7005	+17091	+16436	+20037	+15399	+14606	+14052	+11529	+7483	+7213	+137494
NEAR GRAYSON	96.05	108	25398	22731	66793	35629	45872	60103	17812	21380	22794	20898	18424	19654	377488
TUOLUMNE RIVER AT TUOLUMNE CITY	91.0R	125	43686	32063	80499	51124	31031	23048	20598	20788	19498	45596	63888	63669	495488
Diversions			18	650	863	12966	12914	14338	18114	14978	9160	2770	483	282	87536
Unmeasured Accretions			+13347	+7502	+8064	+9707	+19922	+6499	+4470	+3601	+2765	+2752	+564	+1197	+80390
AT HETCH HETCHY CROSSING	82.65	109	82413	61640	154493	83494	83911	75312	24766	30791	35897	66476	82393	84238	865830
STANISLAUS RIVER Nr. MOUTH	79.7R	131	21870	12580	67190	41930	146000	52980	8662	8348	8920	11820	12730	14280	407310
Diversions			0	0	0	4043	3583	3474	4051	3619	2642	1333	84	0	22829
Unmeasured Accretions			+2717	+4364	-8383	+1019	-9328	-5618	+5213	+1500	+345	+957	-919	-1918	-10051
NEAR VERNALIS	76.7	110	107000	78590	213300	122400	217000	119200	34590	37020	42520	77920	94120	96600	1240260
FRIANT RESERVOIR TO VERNALIS															
Total Unmeasured Accretions			+22944	+13961	+5890	+1539	+159147	-21040	-17790	-22946	-16799	+15957	+8469	+7913	+140445
Total Diversions			8384	32060	51517	153150	145804	180827	216548	176317	103626	66548	22444	25637	1182662
REVISED FIGURES FOR 1948 SACRAMENTO-SAN JOAQUIN WATER SUPERVISION REPORT - TABLE 3															
INFLOW TO FRIANT RESERVOIR[a] - 1948			30930	31580	43499	122676	267538	273405	105399	69144	65382	54120	43747	34877	1142297
Change in Storage - 1948			+9900	+900	-7000	+59400	+145200	+135600	-102500	-129800	-87800	-23700	+17700	+10700	+28600
COTTONWOOD CREEK Nr. FRIANT - 1948			0	0	3	20	1	0	0	0	0	0	0	0	24
MADERA CANAL - 1948			0	712	2880	728	8505	10717	20116	23020	9025	141	0	0	75844
Diversions - 1948			0	0	62	6	9	45	59	34	2	0	27	37	281
Unmeasured Accretions - 1948			-650	-472	-1050	-2148	-2875	+1143	+4624	+4090	+1755	+499	+670	+320	+8906
BELOW FRIANT - 1948			21680	30440	48610	64710	116700	122900	183100	171800	142400	77180	25350	23820	1028690
MERCED RIVER															
AT EXCHEQUER		115	2280	2030	28200	81010	128100	137600	114500	92250	53590	3080	2380	2280	647300
MERCED IRRIGATION DISTRICT CANAL			462	280	737	73120	98762	101600	105694	86128	50989	850	194	184	519000
Unmeasured Accretions			-1349	-1316	+3677	+95	-408	-4890	-7691	-5309	-2094	-1944	-1609	-1348	-24186
BELOW SNELLING	42.1	116	469	434	31140	7985	28930	31110	1115	813	507	286	577	748	104114
Diversions			11	0	2	146	1426	1503	1661	1401	1193	1039	523	29	8934
Unmeasured Accretions			+4800	+5372	+5732	+3711	-5674	+3683	+4071	+4886	+4774	+3980	+3800	+4006	+43141
AT CRESSEY	27.6	117	5258	5806	36870	11550	21830	33290	3525	4298	4088	3227	3854	4725	138321
Diversions			76	2	60	1960	1874	3379	3473	1800	1442	498	410	256	15230
Unmeasured Accretions			+4298	+3156	-440	+8150	+4984	+9049	+9168	+8922	+7814	+5511	+4476	+4591	+69679
NEAR STEVINSON	4.6	118	9480	8960	36370	17740	24940	38960	9220	11420	10460	8240	7920	9060	192770
EXCHEQUER TO STEVINSON															
Total Unmeasured Accretions			+7749	+7212	+8969	+11956	-1098	+7842	+5548	+8499	+10494	+7547	+6667	+7249	+88634
Total Diversions			549	282	799	75226	102062	106482	110828	89329	53624	2387	1127	469	543164
TUOLUMNE RIVER															
ABOVE LA GRANGE DAM		120	32870	20980	55290	214000	172200	174900	133400	120900	86900	60050	45730	58900	1176120
MODESTO IRRIGATION DISTRICT CANAL	53.5R		2991	1128	3686	71314	58794	65004	46437	45919	30702	8880	83	2246	337184
TURLOCK IRRIGATION DISTRICT	53.5L		622	636	729	111500	108400	107900	86920	74970	56190	23010	912	14370	586159
Unmeasured Accretions			+853	-7976	-12475	-5216	+121	+529	+877	+1201	+673	+5660	+2845	+2436	-10462
AT LA GRANGE	50.5	121	30120	11240	38400	25970	5127	2525	920	1212	681	33820	47580	44720	242315
Diversions			0	0	0	0	0	0	0	0	0	0	0	0	0
Unmeasured Accretions			+1590	+8860	+19560	+8320	+3374	+1964	+1534	+1654	+1372	-2060	+310	-840	+45638
AT ROBERTS FERRY BRIDGE	39.9	122	31710	20100	57960	34290	8501	4489	2454	2866	2053	31760	47890	43880	287953
Diversions			0	0	0	24	50	82	82	78	59	22	4	0	401
Unmeasured Accretions			+7070	+6100	+3580	+3844	+3489	+3545	+3868	+4717	+5803	-798	-556	+5210	+45872
AT HICKMAN BRIDGE	31.7	123	38780	26200	61540	38110	11940	7952	6240	7505	7797	30940	47330	49090	333424
DRY CREEK Nr. MODESTO	16.5R	126	1912	2670	16840	3606	4675	3340	2618	2646	2404	2025	1666	2291	46693
Diversions			0	0	15	276	351	490	529	491	377	186	44	0	2759
Unmeasured Accretions			+9378	+6460	+6295	+8260	+11026	+7918	+7481	+5790	+4236	+13021	+11988	+8209	+100062
AT MODESTO	15.92	124	50070	35330	84660	49700	27290	18720	15810	15450	14060	45800	60940	59590	477420
Diversions			8	18	12	256	491	411	442	464	237	106	86	20	2551
Unmeasured Accretions			-6376	-3249	-4149	+1680	+4232	+4739	+5230	+5802	+5675	-98	+3034	+4099	+20619
AT TUOLUMNE CITY	3.35	125	43686	32063	80499	51124	31031	23048	20598	20788	19498	45596	63888	63669	495488
ABOVE LA GRANGE TO TUOLUMNE CITY															
Total Unmeasured Accretions			+12525	+10195	+12811	+16888	+22242	+13695	+18990	+19164	+17759	+15725	+17621	+19114	+201729
Total Diversions			3621	1782	4442	183370	168086	173887	134410	121922	87565	32204	1129	16636	929054

NR No record.
* Not included in inventory or totals.
a Flow of Cottonwood Creek has been omitted and diversions between the dam and Friant gaging station have been added to the computed inflow to Friant Reservoir.

TABLE 3 (CONT'D)

SUMMARY AND INVENTORY OF MONTHLY STREAM FLOW - SAN JOAQUIN RIVER AND TRIBUTARIES - 1949

Item	Mileage	Record in Table No.	Quantities in Acre-Feet												Annual Total
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
								STANISLAUS RIVER							
BELOW MELONES POWER HOUSE		127	18220	16610	62100	106500	248900	115700	62740	56560	10960	4240	5190	8100	715820
OAKDALE CANAL			246	222	246	33562	41503	42036	31813	28753	3965	246	2382	246	188220
SOUTH SAN JOAQUIN CANAL			1225	14479	10257	33398	49148	42788	31850	28737	4394	0	0	0	216276
Unmeasured Accretions			+1001	+5128	+19863	-2760	+3351	-2776	+2274	+2525	+194	+955	+2879	+838	+33472
AT ORANGE BLOSSOM BRIDGE	44.7	128	17750	7037	71460	36780	158600	28100	1351	1595	2795	4949	5687	8692	344796
Diversions			0	0	24	235	316	304	431	377	123	50	10	19	1889
Unmeasured Accretions			+4940	+1623	-836	+6975	+116	+14174	+3672	+3009	+2957	+3398	+2362	+550	+42940
AT RIVERBANK	32.0	129	22690	8660	70600	43520	158400	41970	4592	4227	5629	8297	8039	9223	385847
Diversions			0	0	0	455	735	672	803	831	587	56	2	0	4141
Unmeasured Accretions			+1650	+3960	-1910	+1755	+1035	+10962	+7061	+6464	+4758	+3539	+3343	+4397	+47014
AT RIPON BRIDGE	16.0	130	24340	12620	68690	44820	158700	52260	10850	9860	9800	11780	11380	13620	428720
Diversions			23	9	17	4046	3533	5138	5217	4372	3487	1820	226	15	27903
Unmeasured Accretions			-2447	-31	-1483	+1156	-9167	+5858	+3029	+2860	+2607	+1860	+1576	+675	+6493
NEAR MOUTH	4.3	131	21870	12580	67190	41930	146000	52980	8662	8348	8920	11820	12730	14280	407310
MELONES POWER HOUSE TO MOUTH															
Total Unmeasured Accretions			+5144	+10680	+15634	+7126	-4665	+28218	+16036	+14858	+10516	+9752	+10160	+6460	+129919
Total Diversions			1494	14710	10544	71696	98235	90938	70114	63070	12556	2172	2620	280	438429
								MORMON SLOUGH							
AT BELLOTA	0.2	97	2303	6200	42930	4250	971	5925	58	0	0	0	0	244	62881
Diversions			50	252	0	30	501	440	78	6	0	0	0	0	1357
Unmeasured Accretions			-583	-928	+1270	-380	-379	-165	+63	+6	0	0	0	-244	-1340
STOCKTON DIVERTING CANAL AT STOCKTON	17.9	98	1670	5020	44200	3840	91	5320	43	0	0	0	0	0	60184
								CALAVERAS RIVER							
AT JENNY LIND	35.6	94	3970	8370	42170	7290	4980	9530	347	0	0	4	552	1410	78623
MORMON SLOUGH TO BELLOTA		97	2303	6200	42930	4250	971	5925	58	0	0	0	0	244	62881
Diversions			110	0	9	68	634	764	510	160	38	0	0	0	2293
Unmeasured Accretions			-228	-536	+4601	-850	-1006	-1459	+303	+160	+38	-4	-552	-1156	-689
AT BELLOTA	24.15	95	1329	1634	3832	2122	2369	1382	82	0	0	0	0	10	12760
Diversions			255	475	0	9	380	557	29	0	0	0	0	0	1705
Unmeasured Accretions			-1042	-700	-1485	-1747	-1507	-763	-52	0	0	0	0	-10	-7306
NEAR STOCKTON	8.0	96	32	459	2347	366	482	62	1	0	0	0	0	0	3749
JENNY LIND TO STOCKTON															
Total Unmeasured Accretions			-1270	-1236	+3116	-2597	-2513	-2222	+251	+160	+38	-4	-552	-1166	-7995
Total Diversions			365	475	9	77	1014	1321	539	160	38	0	0	0	3998
								COSUMNES RIVER							
AT MICHIGAN BAR	34.3	86	8170	16790	84320	63100	42440	10960	1690	380	269	618	2890	2890	234517
Diversions			0	0	56	213	644	990	467	57	4	0	0	0	2431
Unmeasured Accretions			+1340	+1300	+36936	+1173	+494	+80	-662	-323	-265	-618	-640	-560	+38255
AT McCONNELL	11.8	87	9510	18090	121200	64060	42290	10050	561	0	0	0	2250	2330	270341

TABLE 4

SUMMARY AND INVENTORY OF MONTHLY STREAM FLOW - TULE RIVER AND TULARE LAKE AREA - 1949

Item	Mileage	Record in Table No.	Quantities in Acre-Feet												Annual Total
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
								TULE RIVER							
NEAR PORTERVILLE	-1.0	132	2740	2960	6930	12400	9120	2010	87	17	9	25	1230	1870	39398
SOUTH FORK TULE RIVER	0.0	133	534	798	2630	3450	2120	476	13	0	0	0	237	329	10587
Diversions			606	635	542	911	1171	934	38	0	0	0	200	300	5337
Unmeasured Accretions			+184	+237	-67	-179	-257	+20	+147	+18	-9	-25	-71	+45	+43
AT WORTH BRIDGE	2.2	134	2852	3360	8951	14760	9812	1572	209	35	0	0	1196	1944	44691
Diversions			1883	2380	4099	9469	9602	1261	24	0	0	0	378	765	29861
Unmeasured Accretions			-969	-980	-3559	-2979	-20	-311	-185	-35	0	0	-818	-1179	-11035
ABOVE LITTLE PIONEER DITCH	14.4	135	0	0	1293	2312	190	0	0	0	0	0	0	0	3795
ELK BAYOU ABOVE ELK BAYOU AVE.		137	0	0	0	0	0	0	0	0	0	0	0	0	0
Diversions			0	0	0	153	0	0	0	0	0	0	0	0	153
Unmeasured Accretions[a]			0	0	-1293	-2159	-190	0	0	0	0	0	0	0	-3642
AT TURNBULL STATION	39.0	136	0	0	0	0	0	0	0	0	0	0	0	0	0
PORTERVILLE TO TURNBULL STATION															
Total Unmeasured Accretions[a]			-785	-743	-4919	-5317	-467	-291	-38	-17	-9	-25	-889	-1134	-14634
Total Diversions			2489	3015	4641	10533	10773	2195	62	0	0	0	578	1065	35351
								INFLOW TO TULARE LAKE AREA							
KINGS RIVER BELOW EMPIRE WEIR #2		138	0	0	0	0	159	0	0	0	0	0	0	0	159
CROSS CREEK BELOW LAKELAND CANAL #2		139	0	0	0	0	0	0	0	0	0	0	0	0	0
TULE RIVER AT TURNBULL STATION		136	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST-SIDE CANAL Nr. LOST HILLS		140	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INFLOW TO TULARE LAKE AREA			0	0	0	0	159	0	0	0	0	0	0	0	159

a The unmeasured accretions shown here include minor diversions below Little Pioneer Ditch on which no records are available.

TABLE 5

ANNUAL IRRIGATED ACREAGE 1940 - 1949

SACRAMENTO-SAN JOAQUIN RIVER SYSTEM SERVICE AREA
AS COVERED BY SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

Stream	Year	1940		1941		1942		1943		1944		1945		1946		1947		1948		1949	
	Crop	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice
Sacramento River Redding to Sacramento		119730	64391	118581	85196	111226	107663	126266	115599	111868	122812	106395	115015	117556	124135	121590	123981	149734	124811	143495	137269
Colusa Trough	(a)	225	700	270	1280	270	1520	600	2766	1540	4487	200	3882	3030	3694	1735	6474	3249	4745	3140	5561
Back Borrow Pit		3130	3259	3890	1969	2755	5647	2811	11684	965	9017	1585	5175	2062	7880	2295	9044	2455	7079	1272	9003
Knights Landing Ridge Cut		452	0	317	803	430	875	400	1005	305	3230	230	3320	1170	2795	1975	1087	685	1265	880	1220
Yolo By-Pass above Highway 40		2049	0	1526	88	1300	0	1460	404	1235	1000	1594	500	620	200	1241	1895	1023	1000	860	930
Lower Butte Creek and Butte Slough	(a)	9647	407	9621	0	8717	1045	8729	2021	7754	1760	7824	2110	8247	1846	4524	1115	4647	660	7136	1875
Sutter By-Pass and Sacramento Slough	(a)	8091	647	7827	1600	5551	1792	5384	3037	5889	4303	4712	6996	9380	4925	8835	3210	7918	2635	8303	6184
Feather River Oroville to Mouth		30117	23526	27658	26640	38477	25177	24089	46566	25235	49843	25106	47865	27189	51052	28264	49749	29534	43258	31022	51131
Yuba River Smartville to Mouth		7220	1270	7472	1345	6661	1125	6280	2310	7009	2401	8815	1085	8872	1956	8282	3630	8716	3115	8838	3300
Bear River Wheatland to Mouth																				974	0
American River Fairoaks to Mouth		3061	0	3046	0	3132	0	3112	0	3205	0	2935	0	2983	0	3670	0	3628	0	3865	0
San Joaquin River Friant to Fremont Ford	(b)					NOT COVERED PRIOR TO 1946								265888	9727	296245	10563	285919	8670	288751	14638
San Joaquin River Fremont Ford to Vernalis		39373	470	39866	484	41934	580	41143	342	42196	1464	41601	849	43094	1396	43076	1355	47300	535	45781	625
Fresno Slough Fresno Slough By-Pass						NO COVERED PRIOR TO 1946								19145	1868	17421	2698	19706	1579	22671	4081
Merced River Snelling to Mouth	(c)	3123	0	3570	0	3302	0	3680	0	4509	0	4403	0	4484	0	5883	0	6494	0	7941	0
Tuolumne River La Grange to Mouth	(c)	1072	0	1295	0	1619	0	1826	0	3161	0	3259	0	3564	0	3761	0	3745	0	4406	0
Dry Creek Waterford-Oakdale Highway																				421	0
Stanislaus River Melones to Mouth	(c)	6902	0	6940	110	7095	130	7360	0	7915	0	6872	0	6343	0	6598	0	7916	0	8548	0
San Joaquin River-Delta Vernalis to Stockton		18457	0	19298	0	17932	0	19685	0	20547	0	19935	0	24545	0	25122	0	25551	0	26946	0
Old San Joaquin River Delta Uplands		29009	0	28842	0	28749	0	40607	0	32331	0	32139	0	34263	0	37859	0	40301	0	46101	0
Tom Paine Slough Delta Uplands		4007	0	3963	0	4357	0	5058	150	14676	235	5165	221	5733	317	5278	546	5077	468	5207	383
Cosumnes River Michigan Bar to Mouth																				1791	0
Mokelumne River Woodbridge to New Hope Bridge																				344	0
Calaveras River Jenny Lind to Mouth																				3571	0
Total above Delta		183722	94200	180208	118921	178519	114844	179131	185395	165005	198283	159396	185948	181019	198183	182411	200185	211589	188668	209785	216473
Sacramento River System		50472	470	51671	594	53950	710	54009	342	57781	1464	56135	849	342518	12991	372984	14616	371080	10784	378519	19344
San Joaquin River System		51473	0	52103	0	51038	0	65350	150	67554	235	57239	221	64541	317	68259	546	70929	468	83960	383
Delta Uplands																					
Grand Totals		285667	94670	283982	119515	283507	145554	298490	185887	290340	199982	272770	187018	588078	211791	623654	215347	653598	199820	672264	236200

(a) Figures for General Crops include acreage flooded for gun clubs.
(b) Figures exclude acreage in Madera Irrigation District.
(c) Figures exclude acreage in Merced, Turlock, Modesto, Waterford, Oakdale and South San Joaquin Irrigation Districts.

TABLE 6

RELATION OF GAGE HEIGHT TO STREAM FLOW - 1949 SEASON

SACRAMENTO-SAN JOAQUIN VALLEY STREAM GAGING STATIONS

STATION	Gage height, U.S.E.D. elevation, for rated flows of:								
	2000 cfs	3000 cfs	4000 cfs	5000 cfs	6000 cfs	7000 cfs	8000 cfs	9000 cfs	10000 cfs
Sacramento River at Sacramento	Flows under 30000 cfs are affected by tidal action and are rated by slope-velocity methods not applicable to this table.								
at Verona			10.2	11.0	11.7	12.4	13.0	13.6	14.2
at Wilkins Slough			23.6	25.5	27.3	28.9	30.1	32.0	33.4
at Colusa			38.7	39.8	40.8	42.0	43.0	44.0	44.9
at Butte City			69.5	70.0	70.5	71.0	71.4	71.8	72.3
near Red Bluff (1)		253.5	254.1	254.6	255.0	255.4	255.8	256.1	256.5
	200 cfs	500 cfs	1000 cfs	2000 cfs	3000 cfs	4000 cfs	5000 cfs	6000 cfs	7000 cfs
Feather River near Oroville (1)		185.7	187.3	189.5	191.3	192.9	194.4	195.9	197.2
at Nicolaus	20.2	20.8	21.6	22.7	23.6	24.5	25.3	26.1	26.9
American River at Fair Oaks (1)	65.0	65.7	66.2	67.2	68.0	68.7	69.4	70.0	70.4
San Joaquin River near Vernalis	12.9	13.7	14.7	16.3	17.4	18.5	19.5	20.4	21.2
at Maze Road	16.6	17.6	18.8	20.5	21.9	23.1	24.3	25.4	26.4
near Grayson	26.0	27.3	29.0						
near Newman	52.8	53.7	54.8	56.5	58.2				
at Fremont Ford	59.3	60.9	62.6	65.1	66.9	68.5			
Merced River at Cressey Bridge(2)	2.2	3.6	5.2	7.4	9.1	10.5			
Tuolumne River at Modesto (1)	36.5	37.7	39.2						
Stanislaus River near Mouth	21.2	22.5	24.2	26.7	28.9	30.7			

(1) U.S.G.S. Datum.
(2) Assumed Datum.

TABLE 7

INFLOW TO SHASTA RESERVOIR - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3740	3510	11000	10020	6850	6240	4020	3400	3980	2830	3320	3470
2	3400	3700	18570	9610	8610	5580	2720	3880	3720	1770	3270	3760
3	4130	3780	20260	8060	8210	5330	2140	3450	2330	3230	3160	2690
4	3980	4990	14570	9090	8400	4920	2470	3350	1770	3340	3260	2460
5	3660	3330	13600	9780	7930	3750	3980	3200	1670	3070	3190	3300
6	3480	2820	12020	9830	7810	5570	3920	2090	2970	3050	1600	3580
7	3800	5450	11050	10850	7030	5000	4060	2060	3490	2820	3890	3850
8	3220	3620	10280	10850	6200	5330	3960	3410	3280	2140	4280	3170
9	2620	3910	13260	10760	7290	4960	3570	3460	3750	2820	7380	3400
10	4080	8350	19500	10330	7860	5210	2270	3420	1730	3300	4970	2320
11	3480	7530	19230	11300	8180	4170	4000	3120	1760	3310	4460	2090
12	3010	4670	20770	11960	8150	3020	3900	3540	2970	3540	2940	3160
13	4060	4020	15490	11900	8470	4510	3950	2370	3550	3100	2140	3420
14	3810	4570	14040	10670	6820	4000	3820	1800	3210	3810	3520	3740
15	3190	4780	16320	11000	7060	3970	3880	3330	3120	2700	3610	3580
16	2590	4330	23670	12430	7020	3830	2130	3450	3360	1860	3740	3930
17	3850	4650	37300	11680	7700	3490	1720	3530	1560	3460	3840	4270
18	4020	4320	41770	11960	7420	2650	3770	3390	2030	3850	3550	3750
19	4090	4020	42640	11650	6920	2500	3930	3410	3640	3600	2740	3960
20	3100	5170	31630	10750	7510	3420	3660	1600	3650	3650	2130	3630
21	3640	8130	24020	10850	6630	3860	3280	1510	3430	3500	3470	3800
22	4070	21240	23120	10400	6630	4110	3430	3310	3560	2130	3730	3510
23	3180	16330	19470	11120	6840	4380	1680	3500	3460	1800	3650	3980
24	3810	11400	16780	9860	6690	4350	2120	3240	1540	3230	3000	2980
25	3960	9830	14900	9380	7030	2980	3070	3480	1710	3450	3540	2530
26	4090	10260	13490	9050	6530	2680	3450	3000	3310	3460	2850	2680
27	3950	9430	12340	9040	6390	3700	3440	1720	3570	3590	2140	3390
28	3550	9140	11710	8920	6650	3520	3620	2180	3350	3580	3790	3390
29	2900	—	11280	7900	8410	3840	3150	3500	3090	3720	3400	3510
30	2380	—	10880	7310	7160	4100	1990	3690	2740	2490	3550	3670
31	3090	—	10440	—	6390	—	1840	3770	—	3930	—	3060
Mean	3546	6689	18561	10277	7316	4166	3192	3037	2910	3101	3470	3356
Runoff in Ac.Ft.	218040	371460	1141290	611520	449830	247870	196240	186760	173160	190670	206500	206340
	Water Year Total 4317180								Calendar Year Total 4199680			

This is the total mean second-feet flow inflowing to Shasta Reservoir as computed by the U. S. Bureau of Reclamation, taking into account change in storage, release, spill and evaporation; and represents the natural flow passing the dam site if the dam had not been constructed. Drainage area is 6665 square miles.

TABLE 8

DAILY CONTENT OF SHASTA RESERVOIR IN ACRE-FEET - 1949

Date	Figure given is amount in storage at end of day in thousands of acre-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2274.4	2186.1	2362.5	3333.8	3725.8	3807.1	3575.6	3184.8	2807.5	2579.5	2422.1	2342.2
2	2269.2	2182.9	2389.2	3347.4	3731.1	3805.3	3562.9	3173.0	2798.6	2571.7	2418.0	2341.0
3	2265.3	2180.1	2419.9	3357.9	3735.5	3802.6	3548.7	3160.3	2787.8	2566.9	2413.5	2338.4
4	2261.0	2176.8	2343.4	3370.4	3740.3	3799.2	3535.0	3147.4	2776.0	2562.2	2409.2	2335.1
5	2256.1	2177.8	2464.9	3384.3	3744.2	3793.4	3524.4	3134.3	2764.0	2557.1	2404.7	2333.6
6	2250.9	2177.0	2483.4	3398.3	3747.7	3790.7	3513.8	3118.9	2754.6	2551.6	2396.9	2331.7
7	2246.3	2177.6	2497.7	3314.3	3749.5	3786.5	3503.2	3103.6	2746.5	2546.0	2393.8	2328.3
8	2242.6	2174.5	2512.1	3430.4	3749.8	3782.8	3492.5	3090.9	2738.1	2588.9	2391.5	2326.4
9	2237.6	2174.1	2530.4	3446.3	3752.4	3778.3	3481.2	3078.2	2730.9	2533.0	2396.0	2325.0
10	2234.8	2181.4	2563.4	3461.5	3756.6	3774.0	3467.2	3065.5	2720.1	2528.4	2395.8	2321.6
11	2231.1	2189.6	2596.1	3478.2	3761.4	3766.6	3456.5	3052.2	2709.1	2523.8	2395.2	2317.8
12	2226.8	2193.2	2633.2	3496.2	3765.8	3756.9	3445.5	3039.9	2700.6	2519.6	2391.7	2315.0
13	2224.8	2195.6	2659.8	3513.8	3771.1	3750.0	3434.9	3026.2	2693.7	2514.5	2386.5	2313.8
14	2222.2	2196.0	2683.2	3528.4	3773.3	3741.9	3424.0	3011.2	2686.4	2510.5	2383.9	2312.7
15	2219.8	2196.5	2710.8	3544.6	3775.9	3734.0	3413.1	2999.4	2679.0	2504.5	2381.4	2311.9
16	2216.5	2198.9	2752.9	3563.9	3778.6	3725.1	3398.8	2988.1	2672.3	2496.9	2379.3	2311.7
17	2213.4	2001.5	2822.0	3581.8	3782.0	3714.6	3383.6	2976.8	2662.3	2492.3	2377.2	2312.3
18	2210.6	2203.8	2900.2	3599.1	3785.2	3703.6	3372.3	2965.3	2653.3	2488.4	2374.7	2311.9
19	2207.7	2206.2	2980.2	3615.0	3787.6	3692.6	3360.8	2953.7	2647.7	2484.2	2371.0	2311.9
20	2203.1	2211.0	3038.3	3629.2	3791.3	3683.3	3348.9	2939.8	2642.5	2480.2	2366.2	2311.2
21	2199.6	2220.2	3081.4	3643.1	3793.4	3674.7	3336.0	2925.8	2636.9	2475.8	2364.1	2310.8
22	2201.8	2256.9	3122.0	3656.5	3795.2	3666.4	3323.4	2914.9	2631.9	2468.7	2362.5	2310.2
23	2202.2	2279.9	3155.4	3670.0	3797.6	3658.1	3307.4	2904.5	2627.0	2461.0	2360.8	2310.6
24	2200.4	2296.1	3184.1	3681.2	3799.5	3649.3	3292.2	2893.6	2618.3	2456.0	2357.7	2309.1
25	2198.7	2309.9	3208.9	3691.1	3801.9	3637.7	3279.0	2883.3	2610.2	2451.5	2355.6	2306.6
26	2197.4	2324.7	3231.1	3700.5	3802.4	3625.3	3266.5	2872.0	2605.5	2447.2	2352.7	2304.6
27	2196.0	2338.0	3250.9	3709.9	3802.6	3615.0	3254.0	2858.2	2601.2	2443.1	2348.3	2303.8
28	2193.8	2349.9	3209.4	3717.5	3802.6	3604.5	3241.8	2845.3	2596.5	2439.3	2347.2	2303.0
29	2193.8	—	3286.9	3721.4	3806.4	3594.5	3228.7	2835.1	2591.2	2435.8	2345.5	2302.5
30	2192.9	—	3303.8	3724.0	3807.9	3585.3	3213.2	2825.1	2585.2	2429.9	2343.9	2302.3
31	2189.8	—	3319.5	—	3807.7	—	3197.3	2816.0	—	2426.6	—	2300.9
Monthly Change	-89.1	+160.1	+969.6	+404.5	+83.7	-222.4	-388.0	-381.3	-230.8	-158.6	-82.7	-43.0

Annual Gain or Loss in Storage: Calendar Year +22000 Acre-Feet; Water year -80700 Acre-Feet.
Differences in Storage 1948 to 1949: Maximums +62400 Acre-Feet; Minimums -104500 Acre-Feet.

Reservoir water level recorder maintained by U. S. Bureau of Reclamation.

TABLE 9

FLOW OF SACRAMENTO RIVER AT KESWICK - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6120	5340	4810	2880	5850	6540	8760	9620	8190	5900	5700	4420
2	6130	5390	7210	2860	5820	6520	9100	9690	8240	5800	5550	4460
3	6170	4370	5890	2850	5810	6500	9240	9730	7800	5810	5450	4220
4	6300	6520	3340	2860	5820	6540	9280	9760	7800	5820	5500	4210
5	6220	3200	3060	2850	5800	6560	9280	9730	7780	5950	5510	4190
6	6170	3060	2990	2820	5790	6730	9250	9760	7800	5940	5600	4700
7	6180	5090	3880	2820	5800	6930	9250	9730	7700	5850	5500	5780
8	5300	5190	3260	2810	5840	7060	9280	9730	7540	5860	5500	4250
9	5200	4170	4650	2800	5840	7100	9280	9780	7540	6090	5340	4090
10	5530	5040	4510	2790	5600	7130	9240	9730	7320	5870	5270	4120
11	5340	3750	4350	2900	5590	7570	9280	9730	7360	5840	5010	4110
12	5260	3000	2930	2990	5600	7750	9310	9780	7290	5800	4900	4620
13	4740	2830	2540	3030	5610	7888	9210	9350	7220	5780	4900	4190
14	5160	4220	2510	3220	5620	7680	9250	9320	7050	5840	4920	4440
15	4460	4490	2850	2600	5630	7710	9250	9280	6930	5780	4880	4200
16	4330	3240	3320	2400	5620	7920	9280	9170	6840	5790	4860	4150
17	5440	3330	3800	2460	5610	8540	9280	9140	6710	5780	4930	4170
18	5450	3130	4590	2980	5530	8100	9280	9210	6560	5840	4860	4130
19	5630	2900	4540	3530	5520	8190	9530	9170	6460	5930	4620	4100
20	5440	2860	3490	3510	5530	8230	9520	8620	6260	5810	4640	4200
21	5450	3520	3260	3670	5500	8310	9620	8590	6260	5800	4680	4140
22	3240	3310	3340	3670	5540	8270	9600	8790	6160	5840	4530	3940
23	2980	4970	3320	4070	5460	8440	9660	8720	5980	5840	4760	3980
24	4520	3430	2910	4180	5500	8710	9630	8730	5940	5790	4620	3950
25	4740	2960	2740	4220	5540	8680	9700	8690	5840	5880	4650	3920
26	4700	2970	2650	4220	5980	8730	9700	8680	5830	5780	4480	3950
27	4660	2860	2580	4290	6020	8780	9700	8720	5880	5800	4530	3990
28	4610	3200	2550	5030	6500	8710	9670	8720	5890	5600	4430	3960
29	3160	—	2520	5850	6560	8720	9640	8750	5880	5550	4440	3970
30	2850	—	2480	5870	6510	8730	9620	8780	5770	5590	4470	3950
31	4400	—	2530	—	6560	—	9640	8370	—	5560	—	3970
Mean	5028	3869	3529	3434	5790	7775	9398	9212	6861	5810	4968	4209
Runoff in Ac.Ft.	309200	214900	217000	204400	356000	462700	577800	566400	408200	357200	295600	258800
	Water Year Total 4420800								Calendar Year Total 4228200			

U. S. Geological Survey and Division of Water Resources cooperative station located at Mile 250.5 above Sacramento. These flows include releases from Shasta Reservoir. Drainage area is 6,710 square miles. Period of record 1938 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 10

FLOW OF SACRAMENTO RIVER NEAR REDDING* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5870	5380	4540	2760	5660	6090	8030	9330	7680	5120	5100	4340
2	5820	5420	7840	2790	5730	6110	8170	9360	7680	5030	5120	4480
3	6020	5380	6350	2770	5730	6090	8460	9360	7280	5030	5190	4260
4	6140	6280	3900	2740	5680	6090	8460	9360	7170	5030	5190	4260
5	6060	3960	3310	2740	5680	6140	8550	9360	7250	5100	5240	4300
6	6020	3250	3180	2720	5680	6210	8490	9390	7200	5150	5380	4690
7	5970	4980	3860	2690	5680	6440	8520	9390	7170	5050	5310	5560
8	5330	5400	3590	2690	5680	6520	8550	9440	7030	5100	5310	4320
9	5190	4540	4690	2680	5730	6630	8550	9420	6980	5220	5330	4160
10	5420	5190	5580	2660	5510	6550	8520	9390	6820	5080	5330	4180
11	5380	4400	5330	2740	5540	6870	8580	9360	6790	5030	5010	4160
12	5260	3360	3420	2910	5540	7200	8600	9390	6740	5050	4780	4600
13	4800	3030	2760	2940	5540	7280	8550	8960	6660	5050	4780	4200
14	5120	4100	2600	3160	5540	7090	8600	8890	6470	5050	4800	4460
15	4560	4730	3000	2710	5540	7110	8600	8920	6420	5050	4780	4240
16	4460	3650	3570	2180	5540	7360	8600	8780	6330	5050	4760	4140
17	5330	3540	4040	2320	5540	7740	8600	8780	6180	5100	4780	4200
18	5420	3290	5220	2610	5380	7460	8630	8720	6060	5100	4760	4200
19	5580	3140	5080	3010	5350	7460	8920	8780	5940	5240	4560	4260
20	5420	3030	3920	3250	5330	7300	8920	8260	5730	5150	4560	4180
21	5440	3690	3400	3120	5330	7840	9010	8230	5730	5120	4580	4120
22	3690	3650	3590	3330	5380	7570	9070	8340	5610	5120	4560	3860
23	3080	4870	3380	3520	5330	7680	9100	8280	5420	5120	4640	3880
24	4240	3960	3010	3880	5330	8000	9100	8310	5380	5120	4580	3840
25	4780	3060	2720	3920	5380	7950	9210	8280	5280	5190	4600	3800
26	4820	3350	2600	3940	5630	8030	9210	8260	5310	5170	4320	3820
27	4690	3060	2520	3900	5700	8140	9240	8230	5310	5150	4500	3800
28	4690	3330	2470	4660	6090	8030	9240	8260	5330	4980	4400	3820
29	3460	—	2400	5580	6210	8030	9270	8230	5280	4960	4420	3780
30	2890	—	2340	5660	6160	8030	9270	8230	5240	4940	4440	3740
31	3980	—	2330	—	6180	—	9240	7920	—	5010	—	3760
Mean	4998	4108	3759	3219	5623	7168	8770	8813	6316	5086	4837	4175
Runoff in Ac.Ft.	307300	228100	231200	191600	345800	426500	539200	541900	375800	312700	287800	256700
	Water Year Total 4270200								Calendar Year Total 4044600			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located at Mile 240.7 above Sacramento. Station is located below the diversion dam of Anderson-Cottonwood Irrigation District. Period of record 1945 to date. Records for 1949 computed by Division of Water Resources.

* Also known as Sacramento River above Churn Creek Pumps.

TABLE 11

FLOW OF SACRAMENTO RIVER AT BALLS FERRY - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6740	5240	5140	4440	6380	6830	8230	9300	8000	5260	5220	4310
2	6880	5410	16400	4440	6520	6830	8140	9300	7950	5310	5190	4330
3	6630	5260	17000	4350	6690	6630	8680	9300	7580	5260	5220	4090
4	6440	6210	10800	4270	6460	6550	8620	9300	7440	5240	5170	4070
5	6450	5600	7000	4220	6380	6600	8710	9270	7440	5340	5190	4130
6	6400	3550	6440	4220	6330	6660	8620	9270	7440	5340	5310	4380
7	6370	4760	5890	4270	6330	6880	8620	9270	7390	5260	5290	5200
8	5880	5740	5610	4270	6280	7050	8620	9300	7280	5220	5310	4510
9	5290	5340	7920	4240	6330	7160	8590	9330	7220	5380	5510	3960
10	5310	5310	21900	4240	6220	6970	e8560	9330	7110	5310	5460	3960
11	5460	8540	27900	4290	6200	7280	e8560	9300	7110	5260	5140	3920
12	5410	4740	13700	4490	6170	7560	8560	9330	7020	5240	4860	4270
13	4980	3830	8170	4490	6220	7470	8540	9050	6940	5220	4810	3960
14	5140	4290	6490	4580	6280	7470	8540	8870	6770	5170	4790	4090
15	4930	5170	8030	4270	6330	7470	8540	8960	6690	5140	4790	4090
16	4560	4350	9080	3920	6170	7840	8650	8780	6520	5170	4740	3940
17	5170	4020	10500	3830	6070	7810	8510	8810	6410	5170	4670	4160
18	5480	3850	16700	4020	5960	8060	8540	8740	6300	5170	4760	4220
19	5580	3770	18300	4420	5910	7780	e8710	8810	6170	5190	4510	4270
20	5460	4270	13600	4630	5860	7560	8990	8420	6020	5220	4420	4070
21	5480	5310	9430	4400	5910	8260	8960	8230	5910	5190	4420	4050
22	4540	8140	12400	4600	5840	7860	9080	8340	5840	5190	4420	3850
23	3410	8590	10000	4600	5780	7920	9080	8450	5660	5190	4510	3810
24	3790	6440	8370	4980	5710	8230	9080	8400	5540	5190	4420	3770
25	4700	4600	6550	5000	5760	8030	9080	8400	5510	5220	4490	3770
26	4900	4830	5760	4950	5910	8230	9120	8400	5480	5190	4270	3770
27	4810	4650	5310	4760	6070	8420	9080	8370	5510	5120	4380	3830
28	4790	4490	4980	5480	6280	8260	9150	8340	5480	5020	4240	3810
29	4290	—	4700	6440	6690	8200	9180	8370	5480	4980	4270	3830
30	3330	—	4490	6460	7020	8170	9150	e8400	5410	4950	4270	3850
31	3550	—	4290	—	7050	—	9240	7860	—	5000	—	3790
Mean	5231	5225	9931	4586	6229	7535	8765	8826	6554	5197	4802	4066
Runoff in Ac.Ft.	321600	290200	610600	272900	383000	448400	539000	542700	390000	319600	285700	250000
	Water Year Total 4932200								Calendar Year Total 4653700			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located at Mile 224.5 above Sacramento. Period of record 1945 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 12

FLOW OF SACRAMENTO RIVER NEAR RED BLUFF (IRON CANYON) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7540	5340	5750	6050	7400	7640	8620	9600	8130	5450	5800	4850
2	8060	5930	16300	6120	7460	7430	8560	9580	7920	5670	5900	4910
3	7360	6040	25000	5980	7810	7290	8930	9690	7780	5730	5820	4820
4	7200	6100	19400	5890	7480	7240	9120	9660	7510	5690	5650	4650
5	7100	7150	11100	5800	7270	7190	9090	9550	7560	5750	5660	4610
6	7050	4030	10300	5820	7140	7190	9150	9490	7620	5830	5700	4610
7	7020	4640	8320	5860	7110	7270	9180	9520	7560	5870	5790	5220
8	6910	6340	8080	5930	7060	7480	9150	9520	7560	5790	5730	6100
9	5920	6220	8120	5840	7190	7510	9090	9550	7400	5890	6020	4720
10	5830	5320	32000	5890	7190	7320	9010	9580	7320	6120	6090	4590
11	6100	10300	48000	6080	7140	7780	9010	9550	7240	5920	5910	4580
12	6030	6320	31500	6400	7140	7890	9010	9550	7190	5940	5440	4550
13	5790	4700	14800	6300	7140	7430	8900	9350	7140	5780	5330	4880
14	5560	4380	10700	6080	7270	7860	8870	8980	7080	5720	5340	4730
15	5680	5660	12600	6000	7380	7830	9010	9210	6900	5780	5280	4920
16	5130	5390	14900	5590	7190	8270	9010	8950	6720	5790	5250	4580
17	5080	4380	15200	5450	6950	8210	9010	9010	6600	5830	5230	4860
18	6060	4480	22300	5570	6900	8650	9040	8980	6470	5860	5310	4940
19	6100	4380	27300	5820	6750	8240	9090	9010	6340	5890	5220	4970
20	6220	4270	25800	6080	6600	8100	9370	8840	6270	5960	5020	4770
21	6180	5980	15500	5750	6670	8320	9260	8430	6080	5910	5080	4670
22	5930	6640	15500	5960	6540	8210	9320	8480	6120	5900	5070	4550
23	3890	11600	18200	5890	6440	8270	9400	8590	5960	5890	5060	4380
24	3780	8930	13200	6320	6340	8560	9460	8540	5750	5940	5030	4380
25	5160	6370	10300	6200	6300	8540	9520	8590	5770	5960	5000	4350
26	5320	5960	8730	6050	6320	8590	9490	8560	5680	6000	4930	4350
27	5320	6080	7940	5770	6750	8670	9520	8620	5640	5910	5010	4390
28	5320	5610	7460	6240	6670	8670	9490	8590	5750	5910	4910	4390
29	5160	—	6950	7350	7270	8590	9520	8590	5800	5690	4880	4350
30	3680	—	6500	7540	7830	8480	9520	8540	5800	5630	4860	4360
31	3640	—	6100	—	7780	—	9520	7970	—	5660	—	4320
Mean	5843	6019	15610	6054	7048	7957	9169	9054	6755	5828	5377	4689
Runoff in Ac.Ft.	359200	334300	959700	360200	433300	473500	563800	556700	402000	358300	320000	288300
	Water Year Total 5689400								Calendar Year Total 5409300			

U. S. Geological Survey station located near the Iron Canyon dam site at Mile 198.6 above Sacramento. Drainage area is 9,300 square miles. Period of record 1902 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 13

FLOW OF SACRAMENTO RIVER AT VINA BRIDGE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7860	5380	6380	7580	8720	8990	8370	9610	8400	5660	5560	5080
2	8560	6300	13100	7710	8720	8880	8340	9610	8260	5660	5730	5060
3	7890	6460	29800	7650	9190	8640	8320	9640	8240	5600	5780	5060
4	7580	6430	27100	7550	8970	8400	8700	9580	7860	5600	5780	4900
5	7500	7730	16300	7550	8620	8290	8720	9610	7780	5630	5780	4980
6	7520	5000	14400	7710	8430	8180	8780	9610	7810	5700	5800	4980
7	7520	4300	11200	7940	8370	8260	8750	9640	7780	5680	5930	5400
8	7450	6610	10200	8050	8340	8430	8720	9660	7760	5630	5930	6380
9	6590	6720	8990	8020	8340	8560	8670	9660	7630	5680	6280	5160
10	6300	5930	38100	8180	8400	8370	8700	9720	7550	5930	6510	4980
11	6480	9470	81900	8640	8510	8370	8670	9690	7450	5780	6380	4930
12	6540	8450	56600	9190	8780	8640	8860	9750	7450	5760	5880	4960
13	6510	5730	21200	9130	8720	8620	8830	9750	7290	5600	5660	5360
14	6100	4900	15100	8720	8880	8670	8780	9360	7190	5560	5630	4960
15	6380	5880	15400	8590	9050	8530	8800	9470	7060	5580	5580	5230
16	5700	6000	18900	8240	8940	8590	8860	9270	6930	5580	5530	4980
17	5580	4800	18400	8240	8670	8670	8860	9190	6770	5560	5500	5000
18	6540	4900	21700	8240	8430	9100	8910	9220	6670	5560	5530	5280
19	6670	4730	31200	8290	8210	8780	8880	9080	6590	5600	5500	5230
20	6820	4630	33400	8480	8130	8800	9160	9160	6430	5700	5280	5200
21	6720	6060	20200	8210	8020	8780	9130	8640	6260	5630	5280	4960
22	6870	6510	17400	8130	7990	8860	9220	8640	6200	5660	5280	4860
23	4830	12200	22900	8100	7840	8720	9270	8860	6030	5730	5260	4610
24	4340	10900	16800	8290	7760	8800	9330	8700	5880	5680	5360	4580
25	5530	7810	13500	8100	7630	9020	9380	8750	5800	5930	5260	4460
26	5930	6820	11500	7840	7650	8940	9440	8720	5760	5730	5330	4440
27	5980	7060	10400	7580	7780	8970	9470	8700	5730	5700	5130	4410
28	5900	6560	9780	7450	7760	8970	9470	8880	5730	5680	5200	4410
29	5830	—	9130	8340	8290	8880	9550	8800	5730	5500	5180	4390
30	4410	—	8430	8860	8780	8830	9580	8880	5780	5500	5130	4370
31	4030	—	7940	—	9220	—	9550	8670	—	5500	—	4320
Mean	6402	6599	20560	8153	8424	8685	8970	9243	6927	5655	5599	4933
Runoff in Ac.Ft.	393600	366500	1264000	485200	518000	516800	551500	568300	412200	347700	333100	303300
	Water Year Total 6323100								Calendar Year Total 6060200			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located at Mile 166.5 above Sacramento. Period of record 1945 to date. Records for 1949 computed by Division of Water Resources.

TABLE 14

FLOW OF SACRAMENTO RIVER AT HAMILTON CITY (GIANELLA BRIDGE) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8000	5200	6610	7860	6820	6690	6770	7590	6450	5300	5320	5350
2	8450	6150	10750	7860	6850	6500	6770	7650	6330	5250	5400	5300
3	8110	6330	32930	7750	7200	6200	6880	7570	6350	5200	5450	5350
4	7590	6400	30300	7670	7060	5950	7090	7540	6130	5220	5450	5200
5	7490	7380	18050	7570	6740	5850	7090	7540	6100	5270	5470	5180
6	7490	5470	15140	7650	6560	5720	7140	7510	6250	5320	5550	5200
7	7430	4870	12120	7830	6350	5800	7140	7540	6230	5370	5650	5500
8	7380	6380	10570	7920	6330	5950	7090	7570	6230	5300	5800	6300
9	6800	6740	9350	7860	6380	6100	7200	7570	6250	5320	6250	5500
10	6350	6080	27820	8000	6430	5980	7200	7620	6300	5550	6800	5180
11	6380	8280	73690	8340	6560	5850	7140	7620	6200	5500	6720	5100
12	6430	9150	67930	8730	6690	6250	6980	7590	6230	5470	6130	5080
13	6450	6200	24440	8620	6640	6350	7040	7590	6130	5400	5570	5370
14	6130	5250	16300	7890	6800	6330	7040	7330	6050	5370	5370	5180
15	6280	5770	15040	7540	6820	6230	7040	7170	6000	5370	5570	5370
16	5800	6180	18710	7200	6720	6250	7090	7220	5980	5370	5500	5220
17	5620	5270	18670	7140	6450	6400	7040	7060	5880	5350	5450	5220
18	6250	5130	20740	7250	6280	6800	7090	7090	5750	5370	5420	5470
19	6500	4940	30690	7280	6050	6610	7120	7040	5670	5350	5420	5520
20	6580	4870	35860	7330	5950	6610	7330	7060	5570	5450	5420	5470
21	6500	5820	22290	6930	5950	6580	7330	6720	5400	5420	5500	5200
22	6580	6580	17670	6690	5820	6880	7410	6610	5320	5450	5420	5100
23	5400	10970	24010	6450	5650	6640	7460	6720	5250	5470	5450	4890
24	4370	11120	17980	6450	5420	6640	7490	6720	5100	5450	5520	4820
25	5010	8340	14550	6380	5250	6880	7490	6820	5080	5450	5500	4770
26	5620	7090	12020	6130	5200	6880	7490	6770	5130	5420	5550	4770
27	5770	7300	10750	5720	5400	6880	7490	6720	5200	5420	5400	4770
28	5720	6900	10050	5600	5470	6820	7430	6740	5220	5370	5450	4730
29	5700	—	9380	6400	5880	6800	7430	6770	5300	5250	5370	4770
30	4800	—	8730	7010	6480	6800	7570	6740	5400	5200	5350	4770
31	4110	—	8280	—	6850	—	7590	6770	—	5180	—	4770
Mean	6358	6648	21010	7302	6292	6407	7208	7180	5816	5361	5607	5175
Runoff in Ac.Ft.	390900	369200	1292000	434500	386900	381300	443200	441500	346100	329600	333700	318200
	Water Year Total 5690000								Calendar Year Total 5467100			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located at Mile 149.5 above Sacramento. Period of record 1945 to date. Records for 1949 computed by Division of Water Resources.

TABLE 15

FLOW OF SACRAMENTO RIVER AT ORD FERRY - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8060	4590	7000	9300	6900	6630	6550	7510	6400	5200	5000	5200
2	8360	5830	9190	9110	6900	6500	6590	7480	6380	5040	5120	5100
3	8260	6190	31600	8980	7140	6250	6530	7410	6340	5290	5160	5160
4	7830	6320	34900	8880	7250	6040	6830	7550	6230	5180	e5200	4960
5	7600	6830	23800	8680	6860	5870	6860	7530	6100	5180	e5240	4940
6	7600	6500	18600	8630	6630	5850	6930	7530	6210	5180	e5290	4930
7	7600	5100	15000	8510	6440	5850	6860	7530	6120	5200	e5360	5160
8	7510	5750	12400	8560	6420	5960	6720	7460	6100	5140	e5490	5660
9	7090	6670	11000	8410	6440	6060	6900	7550	6150	5160	e5790	5490
10	6570	6380	27100	8560	6420	6020	6930	7530	6250	5270	e6440	4960
11	6480	6880	80300	8810	6480	5940	6930	7530	6170	5290	e6480	4830
12	6590	10000	94200	9160	6650	6060	6810	7580	6170	5250	e6100	4810
13	6570	6810	37900	9190	6570	6270	6810	7510	6150	5180	e5600	4980
14	6320	5560	21900	8580	6670	6170	6790	7370	6080	5140	e5380	4980
15	6340	5490	18600	8110	6720	6250	6790	7250	6000	5100	5240	5020
16	6080	6170	23100	7740	6700	6250	6950	7000	6000	5120	5220	5060
17	5750	5640	24000	7620	6460	6320	6930	7090	5890	5120	5200	4960
18	6120	5240	24500	7620	6270	6440	6880	7070	5750	5100	5180	5140
19	6550	5160	33600	7720	6170	6610	7020	7110	5640	5140	5200	5220
20	6630	5160	41300	7740	6000	6400	7090	7070	5600	5160	5240	5200
21	6630	5490	30000	7440	5960	6320	7180	6860	5520	5220	5140	5040
22	6650	6630	22700	7110	5910	6670	7180	6630	5370	5220	5100	4980
23	6020	9330	27400	6930	5770	6480	7320	6720	5290	5200	5140	4830
24	4790	11500	23400	6700	5580	6440	7370	6720	5180	5180	5180	4770
25	4830	9010	18600	6670	5410	6650	7320	6740	5100	5160	5160	4770
26	5640	7480	14900	6460	5370	6590	7370	6720	5120	5200	5220	4710
27	5810	7460	13000	6120	5390	6700	7370	6720	5180	5220	5120	4730
28	5850	7440	12100	5910	5520	6740	7370	6720	5200	5130	5120	4730
29	5750	—	11500	6340	5720	6740	7370	6760	5180	5100	5120	4730
30	5430	—	10600	6970	6250	6570	7390	6760	5220	4980	5120	4730
31	4470	—	9840	—	6630	—	7410	6670	—	5000	—	4730
Mean	6509	6665	25290	7885	6310	6321	7011	7151	5803	5164	5345	4984
Runoff in Ac.Ft.	400200	370100	1555000	469200	388000	376200	431100	439700	345300	317600	318000	306500
	Water Year Total 6023200								Calendar Year Total 5716900			

Division of Water Resources station located at Mile 130.8R above Sacramento. Records of flows in excess of 40,000 second-feet were computed by extending the rating curve. Period of record 1948 to date.
e Estimated.

TABLE 16

FLOW OF SACRAMENTO RIVER AT BUTTE CITY - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8220	4580	7140	10300	6960	6700	6520	7360	6410	5240	5050	5160
2	8340	5660	8390	9980	7000	6590	6590	7300	6410	5090	5160	5220
3	8530	6190	26100	9800	7160	6320	6560	7300	6370	5180	5220	5240
4	7960	6410	34500	9640	7390	6080	6850	7300	6340	5220	5260	5180
5	7710	6610	26400	9400	6960	5870	6920	7300	6150	5220	5260	5010
6	7660	7160	19300	9250	6780	5790	6920	7320	6190	5220	5300	5030
7	7690	5260	16100	8920	6560	5740	6940	7300	6260	5240	5360	5110
8	7620	5460	13000	8940	6480	5870	6850	7360	6210	5240	5460	5540
9	7360	6670	11700	8840	6480	5910	6920	7340	6210	5220	5620	5950
10	6720	6670	21800	8800	6500	5890	6960	7340	6280	5340	6340	5160
11	6540	6560	61400	9010	6540	5720	6980	7360	6280	5400	6450	4980
12	6650	10300	80100	9320	6720	5980	6870	7360	6230	5340	6260	4990
13	6650	7300	55600	9440	6650	6120	6780	7360	6190	5280	5600	5010
14	6520	5810	26600	8700	6850	5890	6720	7180	6100	5220	5300	5220
15	6300	5520	20500	8220	6850	6040	6740	7000	6020	5160	5340	5130
16	6280	6300	23000	7920	6870	6020	6780	7000	5980	5180	5340	5240
17	5830	6000	25000	7780	6630	6150	6830	7000	5850	5200	5340	5110
18	5910	5260	24800	7850	6410	6150	6780	6890	5760	5200	5280	5180
19	6520	5300	30000	7960	6280	6520	6780	6830	5660	5200	5340	5260
20	6610	5300	37000	8050	6060	6280	6870	6850	5600	5220	5300	5260
21	6650	5320	32000	7780	5950	6150	7050	6780	5500	5320	5340	5130
22	6700	6700	24000	7430	5890	6370	7070	6430	5380	5320	5260	5070
23	6430	8750	27000	7270	5760	6480	7110	6500	5300	5320	5260	4920
24	4980	11800	25700	7000	5600	6320	7110	6560	5200	5320	5260	4820
25	4730	9730	20900	7000	5380	6560	7180	6630	5090	5320	5300	4770
26	5580	7820	17000	6780	5320	6590	7250	6670	5130	5340	5320	4750
27	5830	7520	14900	6430	5280	6560	7250	6630	5110	5380	5300	4730
28	5830	7590	13700	6100	5460	6560	7200	6630	5130	5300	5260	4730
29	5810	—	12900	6280	5620	6670	7200	6630	5160	5300	5240	4730
30	5700	—	11900	7050	6120	6610	7250	6630	5240	5130	5220	4750
31	4640	—	11000	—	6670	—	7250	6650	—	5130	—	4710
Mean	6597	6770	25140	8241	6361	6217	6938	6993	5825	5251	5411	5067
Runoff in Ac.Ft.	405600	376000	1546000	490400	391100	369900	426600	430000	346600	322900	322000	311600
	Water Year Total 6052700								Calendar Year Total 5738700			

Station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. Station is above Butte City Bridge and is at Mile 115.8 above Sacramento. Period of record 1921 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 17

FLOW OF SACRAMENTO RIVER AT COLUSA - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8070	4810	7570	10200	6620	6650	6180	6990	6660	5560	5340	5570
2	7970	5490	7440	9750	6520	6660	6180	7030	6520	5530	5400	5550
3	8420	6240	13800	9580	6560	6520	6250	7060	6500	5490	5490	5540
4	8020	6400	26200	9380	6850	6270	6380	7090	6530	5470	5520	5520
5	7650	6490	27900	9190	6700	6020	6530	7140	6370	5450	5550	5380
6	7570	7360	22200	9050	6510	5830	6570	7170	6350	5470	5580	5350
7	7540	5920	18400	8840	6360	5780	6610	7200	6400	5460	5630	5380
8	7520	5490	14500	8770	6270	5820	6570	7240	6410	5470	5720	5630
9	7480	6590	12400	8750	6260	5890	6620	7280	6410	5430	5780	6220
10	6890	6840	12700	8660	6270	5830	6710	7310	6470	5470	6270	5630
11	6590	6380	27800	8730	6360	5760	6690	7380	6540	5600	6720	5320
12	6650	8800	34200	8950	6540	5800	6620	7380	6450	5560	6690	5260
13	6680	8610	34200	9250	6550	6010	6560	7380	6450	5500	6240	5260
14	6650	6620	28400	8930	6720	5840	6510	7370	6420	5420	5830	5480
15	6400	5850	22200	8350	6730	5890	6470	7120	6380	5360	5660	5400
16	6500	6260	20700	8020	6760	5810	6460	7020	6330	5370	5730	5500
17	6060	6450	22700	7730	6720	5800	6510	7000	6270	5360	5710	5420
18	5940	5760	22700	7600	6530	5840	6480	6930	6190	5330	5660	5390
19	6620	5680	25000	7550	6430	6060	6450	6910	6040	5310	5650	5590
20	6700	5550	29600	7530	6240	5900	6460	6910	5970	5350	5660	5620
21	6770	5480	30100	7470	6160	5860	6560	6920	5890	5440	5670	5580
22	6760	6410	26400	7150	6110	5830	6620	6640	5740	5440	5670	5440
23	6770	7110	23200	6890	6010	6060	6630	6550	5690	5470	5680	5410
24	5530	10700	25400	6660	5880	5890	6660	6620	5600	5520	5650	5240
25	5080	10600	22200	6630	5720	6010	6690	6650	5490	5510	5720	5230
26	5630	8760	18300	6480	5530	6160	6670	6720	5430	5530	5680	5230
27	5950	7800	15200	6250	5480	6170	6720	6750	5460	5550	5760	5220
28	6090	7870	13500	5970	5590	6140	6740	6700	5440	5580	5660	5230
29	6030	—	12500	5820	5690	6160	6720	6670	5460	5560	5660	5230
30	5980	—	11600	6310	6030	6160	6820	6690	5490	5440	5620	5220
31	5190	—	10800	—	6430	—	6990	6680	—	5390	—	5180
Mean	6700	6869	20640	8015	6295	6014	6569	6984	6112	5464	5753	5426
Runoff in Ac.Ft.	412000	381500	1269000	476900	387000	357900	403900	429400	363700	336000	342300	333700
	Water Year Total 5745400								Calendar Year Total 5493300			

Station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. Station is at the Colusa Bridge below Colusa Weir and is at Mile 89.4 above Sacramento. Period of record 1921 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 18

FLOW OF SACRAMENTO RIVER BELOW WILKINS SLOUGH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8720	5320	8190	11100	5300	5900	5140	6180	5840	5320	5180	5380
2	8560	5320	7960	10500	5340	6100	5140	6160	5730	5320	5200	5360
3	8650	6200	10300	10200	5340	6100	5220	6140	5730	5230	5300	5320
4	8670	6600	20800	9910	5630	5810	5260	6130	5750	5180	5360	5350
5	8310	6790	23100	9680	5810	5450	5500	6140	5760	5130	5380	5310
6	8080	7150	21800	9530	5670	5140	5550	6130	5700	5110	5400	5230
7	8040	6980	19800	9380	5420	4830	5560	6130	5870	5110	5460	5250
8	8030	5980	16700	9230	5250	4750	5530	6080	5980	5160	5540	5390
9	8010	6340	14000	9200	5350	4790	5550	6100	6110	5140	5600	5830
10	7770	6980	12800	9170	5250	4750	5720	6160	6230	5170	5900	5860
11	7360	6940	19300	9050	5270	4700	5710	6100	6370	5260	6520	5380
12	7240	7640	22100	9110	5440	4600	5570	6160	6380	5310	6800	5220
13	7280	9240	22100	9310	5830	4850	5500	6170	6420	5260	6630	5150
14	7310	7720	21600	9240	6210	4880	5440	6220	6530	5190	6170	5260
15	7120	6550	20500	8790	6320	4730	5440	6070	6460	5140	5820	5330
16	7000	6370	20000	8310	6480	4790	5440	5880	6420	5100	5790	5310
17	6790	6690	20300	7920	6500	4770	5480	5850	6380	5140	5800	5280
18	6460	6360	20400	7710	6360	4880	5530	5770	6320	5100	5760	5190
19	6700	6040	20600	7500	6340	4990	5460	5770	6190	5100	5680	5270
20	7090	5900	21400	7280	6140	5190	5450	5800	6050	5080	5710	5430
21	7180	5810	21600	7030	6010	5080	5510	5840	5920	5090	5650	5400
22	7220	6190	21200	6740	5920	4980	5640	5740	5770	5140	5660	5270
23	7200	7030	20600	6250	5770	5120	5630	5480	5580	5170	5640	5170
24	6710	9120	20900	6090	5500	5140	5680	5450	5490	5200	5620	5010
25	5760	10700	20400	5850	5260	5010	5820	5530	5380	5250	5600	4920
26	5680	9710	19100	5660	4970	5170	5860	5660	5350	5260	5600	4860
27	6250	8550	16800	5320	4760	5230	5870	5800	5350	5290	5610	4840
28	6460	8280	14900	4890	4690	5220	5860	5800	5300	5310	5560	4810
29	6420	—	13600	4610	4890	5210	5830	5710	5300	5300	5560	4840
30	6340	—	12800	4800	5080	5210	5870	5780	5250	5260	5440	4810
31	6030	—	12000	—	5480	—	6020	5840	—	5180	—	4790
Mean	7240	7089	17990	7979	5599	5112	5574	5928	5897	5194	5698	5220
Runoff in Ac.Ft.	445200	393700	1106000	474800	344300	304200	342700	364500	350900	319300	339100	321000
	Water Year Total 5445500								Calendar Year Total 5105700			

Station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. Station is located at Mile 62.9 above Sacramento, 0.3 of a mile below Wilkins Slough pumping plant of Reclamation District 108, and 1.3 miles below Tisdale Weir. Period of record 1931 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 19

FLOW OF SACRAMENTO RIVER AT KNIGHTS LANDING - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9470	5550	8430	12600	5420	6800	5180	6390	6960	6090	5780	5770
2	9130	5490	8190	11900	5370	7100	5200	6460	6920	6020	5880	5740
3	9150	6270	8830	11300	5420	7220	5250	6360	6910	5970	5900	5680
4	9170	6850	18700	10900	5660	6890	5310	6310	6930	5860	5930	5740
5	9000	7150	23300	10600	6140	6330	5580	6230	7130	5840	5940	5700
6	8470	7490	22600	10300	6250	5800	5660	6190	7120	5720	6040	5560
7	8390	7470	21100	10000	6050	5400	5720	6180	7600	5720	6100	5480
8	8400	6270	17900	9790	5860	5200	5630	6200	7750	5830	6190	5540
9	8440	6430	14600	9880	5680	5140	5600	6240	8020	5830	6260	5820
10	8150	7320	13700	9870	5700	5070	5710	6360	7920	5930	6590	6220
11	7620	7500	19600	9670	5620	5020	5760	6390	8260	5880	7210	5750
12	7520	7670	23800	9550	5840	4930	5620	6500	8080	5940	7560	5490
13	7630	9710	23600	9640	6290	5080	5550	6580	8120	5950	7380	5350
14	7590	8250	22700	9700	6670	5110	5460	6620	8230	5850	6800	5320
15	7460	6990	21900	9320	6840	4920	5360	6590	8100	5860	6340	5530
16	7320	6510	21100	8850	7300	4840	5380	6480	8070	5790	6220	5430
17	7050	6980	21500	8420	7360	4860	5490	6470	7940	5740	6320	5560
18	6670	6660	21900	8120	7310	4940	5590	6490	7630	5750	6310	5400
19	6940	6210	22300	8000	7570	4950	5500	6390	7350	5660	6260	5420
20	7390	6020	23200	7640	7630	5180	5430	6380	7220	5610	6320	5650
21	7530	5950	23400	7260	7390	5150	5430	6430	7010	5640	6190	5670
22	7540	6210	22900	6860	7500	5190	5550	6410	6760	5690	6160	5650
23	7630	7110	22100	6160	7150	5300	5720	6090	6500	5710	6150	5600
24	7120	8610	22500	5970	6650	5360	5740	6120	6390	5780	6180	5490
25	6010	10800	22400	5690	6070	5220	5930	6310	6220	5770	6150	5380
26	5740	10100	21000	5540	5680	5270	5940	6380	6120	5830	6090	5300
27	6480	8940	18300	5270	5470	5390	6000	6770	6190	5830	6090	5330
28	6830	8460	16000	4920	5260	5390	5960	6810	6230	5840	6030	5350
29	6630	—	14700	4760	5500	5360	5910	6690	6160	5910	5960	5320
30	6700	—	13700	4940	5980	5240	5980	6810	6000	5910	5900	5320
31	6240	—	12800	—	6160	—	6220	6860	—	5780	—	5310
Mean	7594	7320	18990	8447	6284	5455	5625	6435	7195	5824	6274	5544
Runoff in Ac.Ft.	466900	406600	1168000	502700	386400	324600	345800	395700	428100	358100	373300	340900
	Water Year Total 5812000								Calendar Year Total 5497100			

Station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. It is located at the Knights Landing Railroad Bridge, Mile 34.0 above Sacramento, below the point of discharge to the river of Colusa Basin drainage via the Back Borrow Pit of Reclamation Districts 108 and 787. Period of record 1921 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 20

FLOW OF SACRAMENTO RIVER AT VERONA - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12500	8480	14700	23400	16000	11400	5800	6670	7880	7000	6560	7030
2	12600	8620	14400	21600	15700	11400	5880	6900	7830	6970	6720	6900
3	12600	9400	20100	20700	15700	11100	5880	6950	7820	6780	6740	6950
4	12400	10200	37600	20100	16300	10500	5890	6890	7900	6680	6900	6950
5	12000	10600	41200	19800	16300	9400	6040	6810	8010	6610	6970	6870
6	11600	11200	41400	20200	16200	8650	6120	6680	7980	6560	6920	6660
7	11500	11600	38300	20200	15700	8070	6160	6610	8280	6660	6940	6900
8	11600	11400	33800	20500	15400	7750	6130	6600	8650	6580	6970	7220
9	11500	11200	29200	21200	15200	7540	6220	6640	8870	6620	7210	7700
10	11200	11400	26200	21900	14400	7300	6360	6670	9040	6790	7780	7880
11	10500	12000	33400	22700	14100	7210	6440	6680	9280	6810	10200	7300
12	10500	14200	45000	24000	15800	7080	6360	6810	9480	6810	10800	6810
13	11000	14900	52700	25100	17300	6940	6220	6900	9550	6840	9980	6490
14	11300	13300	56100	25800	18300	6890	6120	7020	9750	6680	9260	6560
15	11200	11300	55000	26000	19300	6550	5920	7080	9840	6670	8690	6950
16	10700	10600	52700	26000	20600	6400	5880	6970	9840	6580	8380	7300
17	10200	10600	51000	25900	19600	6280	5980	6900	9710	6440	8300	7370
18	9590	10500	49800	26200	19900	6160	6120	7000	9770	6280	8280	7480
19	9770	9980	48400	26000	18400	6130	5980	7000	9030	6130	8240	7660
20	10200	9800	49200	25700	17200	6360	5840	7020	8800	6160	8060	7830
21	10800	9840	50800	25200	16400	6300	5820	7060	8650	6360	7720	7820
22	11100	10500	50800	24400	15500	6250	5950	7110	8500	6520	7590	7590
23	11200	11900	50500	23800	14600	6310	6000	6860	8040	6560	7830	7300
24	10500	14300	49400	23800	14000	6520	6130	6720	7690	6540	7860	6970
25	9130	17100	47800	23100	13400	6480	6200	6810	7610	6600	7670	6520
26	8670	17200	44100	21700	13300	6440	6300	6950	7340	6620	7450	6340
27	9010	16000	39200	19800	13100	6440	6300	7210	7140	6640	7400	6190
28	9450	15200	34200	18500	12500	6320	6250	7370	7130	6680	7320	6160
29	9400	—	30800	17200	11800	6160	6250	7400	7220	6620	7050	6220
30	9610	—	28200	16400	11300	5980	6260	7510	7080	6610	7060	6080
31	9130	—	25500	—	11400	—	6440	7720	—	6490	—	6130
Mean	10720	11900	40050	22560	15640	7410	6105	6952	8457	6609	7828	6972
Runoff in Ac.Ft.	659400	661100	2462000	1343000	961400	440900	375400	427500	503200	406400	465800	428700
	Water Year Total 9717400								Calendar Year Total 9134800			

Station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. It is located at Mile 19.6 above Sacramento at the mouth of "Cross Canal", main drain between Reclamation Districts 1000 and 1001, and below the mouth of the Feather River. Flows are measured below the mouth of Cross Canal. Drainage area is 21400 square miles. Period of record 1926 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 21

FLOW OF SACRAMENTO RIVER AT SACRAMENTO - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14300	9620	17800	28300	25700	16700	6690	7100	7930	7470	6900	7700
2	14700	9700	17700	26100	26300	15900	6770	7060	8010	7600	7200	7690
3	14600	10500	31300	25100	26100	15400	7010	7200	8530	7640	7280	7590
4	14000	11500	52100	24700	26100	14700	6910	7440	8740	7710	7400	7610
5	13400	11800	51400	24600	26100	13800	7070	7610	8560	7740	7630	7810
6	12800	12900	49600	25600	26000	13300	6910	7540	8130	7310	7700	7700
7	12900	13600	46500	26800	25600	12700	7020	7330	8190	7160	7830	7790
8	13000	13800	40900	27500	25300	12100	7130	7420	8650	6450	7960	8190
9	12700	13300	35400	28100	25000	11900	7190	7780	8850	6830	8860	8620
10	12500	13100	31800	29500	23000	11300	7380	7580	8820	7250	8820	8430
11	11900	13900	36400	31800	22900	11000	7430	7500	9030	7230	11000	7620
12	11500	17600	50300	34600	26200	10700	7560	7670	9120	7320	11100	6960
13	12500	17700	57800	34100	30600	10100	7200	7220	9110	7290	10100	6670
14	13000	16300	60700	35300	33000	9930	6900	7290	9170	7570	9550	6920
15	12900	13900	60100	36100	36000	9560	6530	7180	9380	7980	9010	7500
16	12000	12500	58700	36200	34000	9250	6180	6800	9230	e7090	8930	8120
17	11600	12200	58800	36900	32200	8550	6160	6780	9130	e6900	8770	8810
18	10900	12500	56100	37300	31000	8150	6530	6930	9360	e6730	8790	9040
19	11200	11900	54200	36800	27300	7520	6290	7040	9020	e6610	8990	9070
20	11700	11900	54700	35900	25900	7440	5900	7190	8930	e6680	8940	9170
21	12200	11800	55700	35300	24400	7340	6410	7320	8800	e6960	8630	8870
22	12700	12300	56000	35700	22800	7250	6660	7710	8780	e7120	8540	8410
23	13000	13400	56700	36100	22400	7550	7080	7850	8780	e7110	8750	8130
24	12600	15900	56100	36500	22200	7870	7110	7590	8780	e7110	8610	7780
25	10800	19900	53800	35800	22300	8000	7050	7550	8360	e7200	8390	7100
26	10200	20600	50200	33800	22500	7890	7420	7550	8090	e7250	8020	6650
27	10200	19500	44800	33400	22200	7900	7690	7640	7840	e7340	7950	6570
28	10400	18600	39500	30900	21000	7940	7360	7660	7400	e7270	7880	6500
29	10600	—	35300	28600	19200	7290	7350	7700	7430	e7150	7570	7070
30	10600	—	35000	26800	17700	7030	7120	7640	7390	e7180	7590	7010
31	10300	—	31300	—	17200	—	7060	7950	—	e7060	—	7020
Mean	12180	14010	46345	31810	25440	10200	6938	7410	8585	7204	8490	7746
Runoff in Ac.Ft.	749200	778000	2850000	1893000	1564000	607100	426600	455800	510800	442900	505200	476300
	Water Year Total 12023100								Calendar Year Total 11258900			

Division of Water Resources station located at Mile 0.4 above M Street Bridge. This represents the flow of the Sacramento River past Sacramento (below the City of Sacramento intake) to the Delta. Additional water flows to the Delta via East Borrow Pit of Yolo By-Pass. (See Tables 76 and 85) Daily mean flows are computed from newly derived curves which take into account tidal fluctuations during low stages. Period of record 1904, 1905, 1921, 1924 to date.
e Estimated.

TABLE 22

FLOW OF CLEAR CREEK NEAR IGO - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	117	62	549	780	360	219	67	32	19	24	28	39
2	112	62	2570	766	370	199	65	33	19	22	28	39
3	91	67	2990	745	342	183	62	30	18	20	28	38
4	80	76	1580	724	320	167	60	27	18	19	28	38
5	92	69	1090	731	307	155	58	27	18	19	28	42
6	93	72	899	766	290	149	58	28	19	19	29	42
7	93	73	780	801	282	140	57	28	20	23	30	43
8	96	80	634	822	274	135	55	28	24	24	34	48
9	85	76	1150	801	274	130	52	27	33	26	121	43
10	80	346	2750	815	278	122	49	27	33	28	109	40
11	85	354	3860	850	263	117	49	28	29	30	69	40
12	89	180	2380	857	247	114	46	28	27	29	55	40
13	89	137	1560	801	255	107	44	28	26	26	48	40
14	87	122	1260	738	247	105	43	28	24	24	44	40
15	80	112	1430	717	255	100	42	26	24	24	42	46
16	76	112	2390	717	236	96	40	25	23	24	40	50
17	78	117	3400	710	219	93	39	25	22	23	40	91
18	74	127	6150	689	222	96	39	25	21	23	39	70
19	72	143	5760	647	216	98	38	24	20	26	39	60
20	67	189	3760	594	233	100	39	24	20	28	39	54
21	72	270	2420	563	236	98	39	22	19	29	38	49
22	76	1230	2050	551	209	93	36	22	18	29	38	48
23	67	1030	1760	533	199	87	36	22	16	29	38	48
24	62	608	1510	504	183	85	36	22	16	29	38	49
25	62	493	1280	471	176	80	35	23	16	30	38	48
26	68	575	1140	440	170	76	35	23	17	29	38	46
27	70	647	1060	425	164	76	34	23	18	28	39	46
28	67	521	1020	415	161	74	33	23	24	29	40	44
29	64	—	934	405	202	72	32	22	27	30	40	44
30	64	—	871	375	255	70	32	22	26	29	40	46
31	62	—	815	—	219	—	27	21	—	28	—	46
Mean	79.7	284	1994	658	247	115	44.4	25.6	21.8	25.8	43.5	47.0
Runoff in Ac.Ft.	4900	15770	122600	39180	15200	6820	2730	1570	1300	1590	2590	2890
	Water Year Total 223740								Calendar Year Total 217140			

U. S. Geological Survey and U. S. Army Corps of Engineers cooperative station located 9 miles upstream from the mouth. Clear Creek is a west-side tributary to the Sacramento River at Mile 237.1R. Drainage area is 231 square miles. Period of record 1940 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 23

FLOW OF COTTONWOOD CREEK NEAR COTTONWOOD - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	291	109	730	1260	530	335	97	51	41	43	78	45
2	300	109	2470	1210	524	325	92	43	40	42	60	45
3	244	115	6010	1190	510	302	87	42	42	44	57	45
4	176	119	4700	1160	478	284	83	40	43	46	46	45
5	145	129	2730	1140	447	266	90	38	41	44	41	45
6	188	129	2300	1160	423	262	90	38	44	42	41	45
7	193	129	2000	1210	405	249	92	37	48	40	39	45
8	193	148	1600	1230	411	236	87	40	47	40	39	45
9	180	152	1700	1210	411	227	88	38	46	40	52	42
10	115	184	3500	1250	429	214	88	36	44	38	92	43
11	112	975	5000	1380	478	206	87	39	42	42	118	43
12	126	532	8000	1440	491	194	80	43	40	44	94	43
13	152	345	4000	1300	472	178	72	47	38	41	76	43
14	160	276	2500	1170	524	164	60	40	42	54	70	46
15	137	253	2500	1120	517	156	55	42	42	51	65	49
16	129	235	3000	1120	491	156	55	40	39	53	62	51
17	129	231	5000	1190	453	142	52	42	42	53	62	54
18	126	240	8000	1150	435	139	52	37	42	51	59	59
19	133	267	15000	1050	447	139	58	41	45	54	57	83
20	115	310	9000	964	405	146	55	44	45	53	55	87
21	126	350	5000	916	411	146	54	43	51	49	53	74
22	129	463	4000	908	390	146	49	42	46	52	53	62
23	122	1430	3200	876	364	136	49	44	42	49	54	62
24	105	968	2820	836	335	127	53	43	40	55	53	54
25	89	877	2290	760	320	121	51	40	41	65	52	53
26	95	814	1980	663	306	118	48	40	39	59	53	66
27	115	940	1830	621	302	110	45	43	39	63	53	62
28	122	814	1770	614	297	97	45	42	43	73	53	55
29	112	—	1590	600	316	88	49	37	44	66	53	54
30	112	—	1450	572	395	88	46	38	42	60	50	54
31	112	—	1350	—	359	—	52	38	—	69	—	57
Mean	148	416	3770	1042	422	183	66.5	40.9	42.7	50.8	59.7	53.4
Runoff in Ac.Ft.	9090	23090	232100	62020	25940	10900	4090	2520	2540	3120	3550	3280
	Water Year Total 393320								Calendar Year Total 382240			

U. S. Geological Survey and U. S. Army Corps of Engineers cooperative station located 2 miles upstream from the mouth. Cottonwood Creek is a west-side tributary to Sacramento River at Mile 222.2R. Drainage area is 945 square miles. Period of record 1940 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 24

FLOW OF BATTLE CREEK NEAR COTTONWOOD - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	277	250	302	385	402	406	192	185	163	165	205	220
2	286	250	674	392	444	364	190	176	163	154	197	220
3	259	250	812	382	507	324	185	174	165	183	197	223
4	250	253	740	406	438	308	195	169	158	165	197	218
5	253	271	491	406	416	299	185	169	165	165	202	245
6	274	259	495	406	410	318	183	169	171	169	195	234
7	265	289	410	406	416	324	185	165	165	167	210	231
8	256	262	378	406	406	324	185	174	165	167	205	234
9	262	262	402	413	420	305	178	171	169	160	225	231
10	236	271	1790	424	420	283	178	167	176	176	286	228
11	259	315	2080	452	487	286	190	167	169	167	236	223
12	256	286	987	471	503	280	178	165	176	169	202	225
13	259	265	587	475	535	274	178	167	176	169	239	228
14	256	280	491	463	555	274	176	158	176	167	236	225
15	256	262	607	467	515	271	171	169	174	171	218	223
16	250	253	535	495	507	256	171	165	174	163	218	231
17	265	253	491	519	495	248	171	167	174	180	218	239
18	259	256	503	523	455	253	176	165	165	178	215	248
19	253	256	1240	555	420	245	169	165	178	183	218	271
20	256	245	1060	523	399	250	178	163	169	190	212	236
21	259	283	642	503	388	234	176	158	171	202	228	228
22	256	302	587	511	368	218	176	167	171	195	228	231
23	265	396	642	527	374	215	178	165	169	185	228	228
24	259	312	620	499	360	207	174	165	171	202	220	228
25	250	302	519	479	368	207	190	165	165	195	231	228
26	256	299	467	459	374	207	178	163	178	197	228	215
27	256	296	455	455	374	207	171	163	171	197	218	231
28	256	305	452	455	360	207	176	160	176	195	234	228
29	245	—	424	487	382	202	176	171	176	176	220	225
30	259	—	399	420	452	192	176	169	171	197	220	223
31	259	—	388	—	434	—	167	167	—	202	—	225
Mean	258	278	667	459	432	266	179	167	170	179	220	230
Runoff in Ac.Ft.	15880	15440	41000	27300	26550	15840	11010	10280	10140	11010	13060	14130
	Water Year Total 224100								Calendar Year Total 211640			

U. S. Geological Survey and U. S. Army Corps of Engineers cooperative station located 3 miles upstream from the mouth. Battle Creek is an east-side tributary to Sacramento River opposite Mile 221.5L. Drainage area is 362 square miles. Period of record 1940 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 25

FLOW OF REDBANK CREEK AT FOOTHILLS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					7.7							
2					7.5							
3					7.4							
4					6.7							
5					6.5							
6					6.5							
7					6.2							
8					6.2							
9					6.2							
10					6.0							
11					6.2							
12					e6.2	N	N	N	N	N	N	N
13					e6.0	O	O	O	O	O	O	O
14					e5.9							
15				12	e5.6							
16				11	e5.2							R
17				11	e4.6	F	F	F	F	F	F	E
18				11	e4.2	L	L	L	L	L	L	C
19				10	e4.0	O	O	O	O	O	O	O
20				11	e3.4	W	W	W	W	W	W	R D
21				11	e3.0							
22				10	e2.8							
23				10	e2.2							
24				10	e1.7							
25				10	e1.1							
26				8.7	e1.0							
27				8.7	e.8							
28				8.8	e.5							
29		—		8.5	e.4							
30		—		8.2	e.2							
31		—		—	e0	—			—		—	
Mean					4.2	0	0	0	0	0	0	
Runoff in Ac.Ft.					262	0	0	0	0	0	0	
	Water Year Total								Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 15 miles above the mouth. Station operated only during irrigation season. Redbank Creek is a west-side tributary to the Sacramento River at Mile 191.2R. Recorder installed April 15 and removed July 20. Period of record 1948 and 1949. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 26

FLOW OF CRAIG CREEK NEAR MOUTH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					20	1.5	0.6	3.6	0.7	0	0.3	
2					21	.5	.3	3.1	.5	0	.3	
3					29	.3	.7	3.0	.5	0	1.1	
4					21	.4	.8	2.8	.2	0	2.2	
5					19	.2	.8	2.6	.2	0	2.3	
6					17	.2	1.0	3.1	.2	0	2.2	
7					15	.2	1.0	3.1	.2	0	4.8	
8					13	.2	1.0	3.0	.2	0	8.0	
9					14	.2	1.0	3.6	.2	0	25	
10					15	.2	1.0	3.6	.2	0		
11					16	.3	.9	3.1	.1	0		
12					14	.2	.9	2.8	.1	0		
13					13	.2	.9	3.1	.1	0		
14				31	18	.5	.9	2.2	.1	0		
15				31	17	.5	.9	2.0	.1	0		
16				32	16	.5	.8	2.0	.1	0		
17				36	11	.4	.9	1.7	0	0		
18				36	10	.6	.8	1.7	0	0		
19				39	8.0	.3	1.0	1.6	0	0.1		
20				43	7.6	.3	1.6	1.5	0	.1		
21				42	8.0	.4	1.5	.7	0	.2		
22				38	8.3	.5	1.9	.6	0	.2		
23				28	5.4	.5	1.9	1.2	0	.3		
24				28	2.4	.5	2.2	.9	0	.3		
25				27	.1	.5	2.2	.9	0	.3		
26				25	.1	.4	2.2	.8	0	.4		
27				23	.1	.4	2.4	.7	0	.3		
28				21	.1	.6	2.4	.8	0	.3		
29		—		24	.2	.6	3.0	.8	0	.2		
30		—		22	1.1	.6	3.1	.7	0	.3		
31		—		—	1.6	—	2.8	.7	—	.3	—	
Mean					11.0	.4	1.4	2.0	.1	.1		
Runoff in Ac.Ft.					678	25	86	123	7	6		
	Water Year Total								Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 0.2 mile above the mouth. Station operated only during irrigation season. Craig Creek is an east-side tributary to the Sacramento River at Mile 187.6L. Recorder installed April 14 and removed November 10. Period of record 1948 and 1949. Records for 1949 computed by Division of Water Resources.

TABLE 27

FLOW OF BUTLER SLOUGH NEAR MOUTH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					4.5	4.3		0	0	e0.4	e3.7	
2					6.8	3.7		0	0	e1.6	e1.9	
3					5.6	e1.4		0	0	4.3	0	
4					11	4.2		0	0	4.2	0	
5					14	3.4		0	0	5.2	0	
6					8.0	5.2		0	0	5.0	0	
7					8.9	3.4		0	0	6.6	e2.9	
8					8.8	3.2		0	0	5.3	3.8	
9					9.8	e1.9		0	0	9.2	e0.4	
10					8.2	e2.1		0	0	13	.4	
11					7.6	3.2		0	0	12		
12					6.8	3.4	N	0	0	5.8		
13					4.5	4.0	0	0	0	4.8		
14					4.2	e1.4		0	0	e3.6		
15				6.8	4.3	e2.1		0	0	e3.6		
16				6.8	e1.4	0		0	0	3.3		
17				8.8	e1.4	0	F	0	0	6.1		
18				8.0	e2.4	0	L	0	0	11		
19				4.4	6.2	e2.4	0	0	0	12		
20				3.2	0	0	W	0	0	7.2		
21				3.0	0	0		0	5.2	5.3		
22				3.0	0	0		0	3.1	5.6		
23				3.0	0	0		.4	3.2	8.2		
24				3.2	0	0		3.7	3.0	8.0		
25				3.0	0	0		e.4	6.0	7.8		
26				3.0	3.4	0		e.4	7.3	5.6		
27				3.0	4.5	0		e.4	2.1	7.8		
28				4.4	0	0		e.4	4.3	4.8		
29		—		3.1	0	0		e3.2	3.1	9.2		
30		—		3.4	4.8	0		0	e.4	7.5		
31		—		—	4.8	—		0	—	5.5	—	
Mean					4.6	1.6	0	.3	1.3	6.4		
Runoff in Ac.Ft.					281	98	0	18	75	396		
		Water Year Total							Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 0.4 mile above the mouth. Station operated only during irrigation season. Butler Slough is an east-side tributary to the Sacramento River at Mile 185.0L. Intermittent flows are due to local drainage above station. Recorder installed April 15 and removed November 10. Period of record 1948 and 1949. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 28

FLOW OF ANTELOPE CREEK NEAR RED BLUFF - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	52	40	63	79	97	72	32	29	29	32	32	35
2	63	40	749	77	107	62	31	29	29	32	32	35
3	52	44	995	74	137	55	30	29	38	32	31	35
4	43	44	686	70	112	50	30	30	28	31	32	35
5	47	72	302	70	105	48	30	30	28	31	32	38
6	47	63	310	79	99	48	30	30	28	30	32	39
7	47	76	204	77	99	47	30	30	28	31	32	38
8	47	58	217	77	97	46	29	30	28	30	34	38
9	43	52	189	77	97	43	29	30	29	30	47	38
10	41	55	1360	77	97	42	28	30	29	31	63	37
11	41	156	1920	85	114	41	28	30	29	32	44	36
12	47	77	855	95	112	41	28	30	29	32	38	36
13	47	51	354	97	109	40	28	30	29	31	36	36
14	42	47	237	97	112	40	28	30	29	31	32	36
15	42	44	261	97	109	39	28	30	29	31	35	38
16	40	43	302	102	105	38	28	30	30	30	35	39
17	40	46	258	114	95	38	28	30	30	30	35	42
18	40	52	223	114	87	38	28	30	30	30	35	45
19	40	52	760	124	79	38	28	30	30	31	35	49
20	41	63	479	129	72	38	28	29	30	31	35	40
21	42	97	290	129	66	38	28	29	30	32	35	38
22	46	207	240	137	65	38	28	29	29	32	35	39
23	42	208	251	147	60	36	28	29	30	32	35	39
24	40	126	201	144	58	36	28	30	30	31	35	38
25	40	99	163	132	58	35	28	29	30	31	35	38
26	44	90	142	124	58	34	28	29	30	31	35	38
27	42	79	124	124	55	34	28	29	31	32	35	38
28	40	68	109	116	52	33	28	30	32	32	35	38
29	40	—	97	122	55	33	29	31	32	32	35	38
30	40	—	90	107	70	32	29	30	32	32	35	38
31	40	—	83	—	70	—	29	29	—	32	—	38
Mean	43.8	76.8	404	103	87.4	41.8	28.7	29.7	29.5	31.2	35.9	38.2
Runoff in Ac.Ft.	2690	4260	24820	6130	5370	2490	1770	1820	1760	1920	2140	2350
			Water Year Total	59680						Calendar Year Total	56520	

U. S. Geological Survey and U. S. Army Corps of Engineers cooperative station located 6 miles upstream from the mouth. Antelope Creek is an east-side tributary to the Sacramento River at Mile 180.7L. Drainage area is 124 square miles. Period of record 1940 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 29

FLOW OF ANTELOPE CREEK NEAR MOUTH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					29	4.1	1.7	1.4	1.9	.7	1.2	.5
2					24	3.8	2.0	1.6	1.2	.5	.9	.5
3					29	3.9	2.0	1.4	1.2	.8	.8	.5
4					24	3.0	1.7	1.2	2.2	.6	1.0	.5
5					11	2.5	2.0	1.3	1.8	.7	1.4	.5
6					5.2	2.3	2.0	1.4	1.3	.8	1.6	.6
7					5.8	2.3	2.5	2.0	1.1	.9	1.7	.6
8					5.5	2.0	2.5	2.2	1.0	1.0	2.1	.7
9					5.5	2.0	2.1	2.1	.8	1.0	2.5	.8
10					4.5	1.7	2.2	2.6	.8	1.1	3.3	.7
11					3.0	1.9	2.0	2.5	.9	1.2	3.0	e.7
12					3.6	2.0	2.0	1.8	1.2	1.4	1.9	e.8
13					4.0	1.7	2.4	1.7	1.3	1.5	1.3	e.8
14					5.2	1.5	1.8	2.4	1.2	1.7	.9	e.8
15				14	6.0	2.2	1.7	2.0	1.4	1.4	.6	e.9
16				13	1.8	2.0	1.9	1.9	1.5	1.8	.3	e.9
17				17	3.9	2.2	2.2	2.2	1.4	2.0	.2	e.9
18				19	4.3	2.6	2.2	1.7	1.9	1.8	.4	e1.0
19				13	3.7	2.6	1.7	1.7	1.7	1.3	.5	e1.0
20				20	3.5	2.2	1.7	1.1	2.0	1.2	.5	e1.0
21				20	3.3	2.2	1.7	1.3	1.8	1.2	.5	e1.1
22				21	3.2	2.2	1.5	1.4	1.6	1.7	.5	e1.1
23				25	3.0	2.0	1.7	1.2	1.4	1.9	.4	e1.1
24				25	2.5	2.0	1.7	.8	1.1	1.9	.4	e1.1
25				24	2.2	2.2	1.8	.7	.8	1.9	.4	e1.1
26				20	2.5	2.0	1.7	.9	.9	2.2	.4	e1.1
27				21	3.1	2.0	2.1	1.4	.7	1.8	.4	e1.1
28				18	2.5	2.1	1.7	1.4	.6	2.2	.5	1.2
29		—		20	3.2	1.9	1.5	1.7	.6	2.2	.5	1.2
30		—		22	4.5	2.2	1.6	1.5	.6	1.8	.5	1.2
31		—		—	4.4	—	1.4	2.2	—	1.8	—	1.2
Mean					7.0	2.3	1.9	1.6	1.3	1.4	1.0	.9
Runoff in Ac.Ft.					430	137	116	100	75	87	61	54
	Water Year Total								Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 2.3 miles above the mouth. Antelope Creek is an east-side tributary to the Sacramento River at Mile 180.7L. Recorder installed April 15. Period of record 1948 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 30

FLOW OF IRRIGATION DRAIN INTO ANTELOPE CREEK - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					8.6	6.2	1.0	0.1	0.7	1.1	0.9	
2					7.5	15	1.3	0	1.2	1.7	3.6	
3					5.7	7.7	1.8	.2	.8	.5	4.4	
4					6.9	17	3.2	.1	1.1	.4	2.5	
5					8.2	17	3.4	.2	.8	.4	5.0	
6					2.4	13	2.1	0	.9	.5	5.5	
7					3.6	12	2.1	.1	2.1	.6	5.0	
8					3.6	13	1.9	.4	4.4	1.9	1.2	
9					2.7	7.6	5.2	.5	4.2	3.0	.2	
10					4.4	4.0	2.3	.7	2.8	1.6		
11					1.6	1.9	.7	.8	3.8	.7		
12					5.5	14	1.5	.3	2.8	1.3		
13				6.3	.8	5.2	3.4	.5	2.8	1.3		
14				6.2	.7	8.4	6.3	.5	2.1	3.2		
15				6.9	1.6	3.8	1.2	.2	4.8	6.2		
16				3.9	1.6	3.2	1.3	.4	5.8	3.4		
17				4.2	6.0	5.3	.9	0	5.8	2.4		
18				6.1	3.4	3.8	.9	.2	3.0	2.2		
19				7.6	4.5	6.0	1.6	1.7	1.9	2.5		
20				8.3	4.6	9.0	.2	1.0	3.2	2.0		
21				11	2.2	8.4	.2	.7	5.6	1.1		
22				5.3	6.6	1.6	.1	.3	4.1	2.5		
23				7.9	6.1	.1	.2	.3	3.1	1.4		
24				7.0	2.5	4.0	.5	.8	1.6	1.5		
25				3.3	3.0	5.0	.6	.6	.9	1.3		
26				2.3	4.2	.7	1.5	1.3	1.2	2.9		
27				3.0	5.8	e.8	1.2	2.3	1.0	2.2		
28				6.5	3.6	e.9	2.1	.8	2.1	4.2		
29		—		8.9	3.9	1.5	2.1	.2	2.1	3.2		
30		—		6.9	7.7	1.2	.3	.7	.8	.5		
31		—		—	5.8	—	.1	.7	—	.5	—	
Mean					4.4	6.6	1.6	.5	2.6	1.9		
Runoff in Ac.Ft.					268	391	102	33	154	115		
	Water Year Total								Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located just above the confluence of this drain with Antelope Creek, to which it is tributary at a point approximately 0.5 mile above the mouth of Antelope Creek. Station operated only during irrigation season. Recorder installed April 13 and removed November 11. Period of record 1948 and 1949. Records for 1949 computed by Division of Water Resources.

TABLE 31

FLOW OF ELDER CREEK NEAR PASKENTA - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	54	8.5	63	140	97	43	9.0	3.0	0.6	0.8	2.0	5.0
2	45	8.0	561	145	97	37	8.8	2.7	.6	.8	2.1	5.0
3	27	8.5	637	147	93	33	8.5	2.3	.6	.7	2.2	5.0
4	17	9.2	392	145	87	30	8.8	1.9	.6	.8	2.2	4.9
5	16	9.0	437	159	81	28	8.5	1.7	.8	.8	2.3	5.3
6	17	11	314	181	77	27	8.2	2.1	.8	.8	2.3	5.5
7	24	20	180	208	77	27	7.5	2.1	.9	.8	2.4	6.5
8	21	20	136	193	78	25	7.3	1.8	.9	.8	3.2	7.1
9	16	22	483	193	77	24	6.5	1.5	.8	1.0	13	6.3
10	16	90	2000	231	81	22	6.1	1.7	.9	1.3	16	5.9
11	15	132	1980	276	99	21	5.5	2.0	.9	1.8	10	5.7
12	15	47	542	265	87	20	5.0	2.0	.8	1.7	7.1	5.5
13	14	30	344	223	82	18	4.9	2.0	.8	1.2	6.1	5.5
14	12	24	304	208	78	17	4.5	1.9	.8	1.1	5.5	5.9
15	10	21	579	210	76	16	4.1	1.8	.8	1.2	5.7	8.2
16	9.8	19	563	226	69	15	3.8	1.8	.8	1.2	5.7	7.1
17	9.5	18	510	243	59	15	3.4	1.7	.6	1.2	5.7	8.8
18	10	18	566	223	66	15	3.4	1.6	.6	1.2	5.3	8.0
19	11	20	658	195	62	16	3.5	1.4	.6	1.4	5.2	7.1
20	11	24	431	170	57	16	3.5	1.4	.6	1.9	5.2	6.5
21	10	26	313	177	53	16	3.5	1.3	.5	2.1	5.0	5.9
22	10	132	480	179	48	14	3.2	1.2	.5	2.2	5.0	6.1
23	10	107	403	174	44	13	3.2	1.2	.4	2.2	5.0	6.1
24	10	75	319	154	40	12	3.2	1.3	.4	2.3	5.0	6.1
25	9.5	72	245	134	38	12	3.4	1.2	.5	2.3	5.0	5.9
26	9.0	83	217	123	36	11	3.0	1.1	.6	2.3	5.0	5.9
27	8.5	88	221	116	33	11	2.9	1.1	.7	2.4	5.0	5.9
28	8.2	68	203	116	33	11	2.7	1.0	.9	2.4	5.0	5.9
29	8.2	—	177	113	53	10	2.6	1.0	1.0	2.2	5.2	5.9
30	8.2	—	159	103	63	9.5	2.3	.9	1.0	2.0	5.0	5.9
31	8.5	—	147	—	49	—	2.4	.8	—	2.0	—	5.9
Mean	15.2	43.2	470	179	66.8	19.5	4.94	1.63	0.71	1.51	5.31	6.14
Runoff in Ac.Ft.	933	2400	28890	10650	4110	1160	304	100	42	93	316	377
	Water Year Total ----								Calendar Year Total 49375			

U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station located approximately 23 miles above the mouth. Elder Creek is a west-side tributary to the Sacramento River at Mile 178.5R. Period of record 1948 to date. (Prior records are available at a site 2½ miles downstream.) Records for 1949 computed by U. S. Geological Survey.

TABLE 32

FLOW OF MILL CREEK NEAR LOS MOLINOS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	139	112	178	207	326	273	123	95	83	87	85	101
2	139	112	723	213	374	246	118	94	83	87	85	99
3	123	116	951	225	388	231	118	90	83	87	85	97
4	108	118	661	231	346	228	116	90	83	87	87	97
5	116	123	384	255	339	237	114	88	83	87	85	104
6	127	127	377	273	339	243	112	88	83	87	85	101
7	129	129	276	302	356	252	112	90	83	92	87	101
8	121	134	249	299	346	249	110	90	87	90	94	101
9	112	136	269	319	329	237	108	90	88	90	139	99
10	101	159	1240	353	363	234	108	90	88	94	149	97
11	101	234	1810	406	485	225	106	90	87	94	118	95
12	110	144	849	449	481	219	106	90	85	90	106	94
13	129	123	433	449	525	210	104	90	85	88	101	95
14	127	129	333	441	477	201	104	90	85	87	99	95
15	121	132	343	445	445	196	101	90	85	87	99	99
16	114	123	437	485	437	187	101	90	85	87	99	103
17	112	129	392	509	426	178	99	88	85	87	97	108
18	114	134	370	513	339	170	99	87	83	87	97	112
19	116	136	772	557	302	168	97	87	83	88	97	112
20	114	159	509	497	289	162	97	87	83	88	97	99
21	116	184	384	501	267	157	97	85	83	88	95	97
22	125	242	350	505	255	152	97	85	83	88	95	99
23	114	273	309	533	267	149	97	85	83	88	95	99
24	112	213	270	477	270	144	97	85	82	88	99	101
25	104	198	243	441	286	142	97	85	83	88	99	99
26	116	196	228	414	302	139	95	85	85	87	97	99
27	121	190	228	414	299	136	95	85	85	87	97	97
28	116	181	240	388	292	132	95	88	88	87	104	97
29	112	—	228	377	286	129	94	95	88	87	108	99
30	114	—	222	339	263	125	94	88	88	87	103	99
31	112	—	207	—	299	—	94	85	—	85	—	99
Mean	117	157	467	394	349	192	103	88.5	84.6	88.1	99.4	99.8
Runoff in Ac.Ft.	7210	8700	28690	23440	21460	11410	6360	5440	5030	5420	5920	6140
	Water Year Total 140980								Calendar Year Total 135220			

U. S. Geological Survey and Division of Water Resources cooperative station located 5 miles upstream from the mouth. Mill Creek is an east-side tributary to the Sacramento River at Mile 178.0L. Drainage area 134 square miles. Period of record 1909 to 1913; 1928 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 33

FLOW OF NORTH FORK OF MILL CREEK NEAR MOUTH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					8.4	8.4	0	.8	3.0	1.9	0	1.8
2					8.6	7.4	0	.2	1.9	.6	0	1.8
3					10	3.8	2.8	0	2.4	1.0	.6	1.6
4					8.4	3.2	2.8	0	3.0	3.2	.9	1.6
5					9.4	3.6	1.9	0	1.4	3.0	1.6	1.2
6					10	4.0	.2	.4	1.9	2.4	1.8	1.8
7					10	4.4	.2	1.0	.2	2.6	4.8	1.8
8					9.4	3.2	1.9	2.4	.4	3.6	3.8	1.8
9					9.4	2.6	.8	1.2	0	3.0	2.1	1.0
10					10	4.0	1.8	.8	0	1.9	2.1	.8
11					15	4.4	.6	.8	0	6.2	1.4	1.2
12					15	2.8	1.6	1.0	.2	7.4	.4	1.8
13					14	4.0	2.4	0	1.9	3.6	.1	2.1
14				12	14	3.0	.9	0	1.4	2.1	.8	1.6
15				12	11	2.6	0	.1	.9	1.8	.9	1.6
16				14	11	1.4	0	0	2.4	1.0	.8	1.4
17				18	10	.8	.8	0	1.8	.8	2.6	1.8
18				19	7.8	0	.1	0	1.9	.8	1.4	1.9
19				20	7.2	0	0	0	3.6	1.4	1.6	3.0
20				16	8.4	1.6	1.0	0	2.1	5.4	1.6	1.9
21				17	7.2	1.4	0	0	1.6	6.8	1.8	1.4
22				18	4.6	1.0	0	0	.9	7.2	1.9	.8
23				20	5.4	1.9	0	.1	0	7.8	1.8	.9
24				18	5.4	4.0	0	0	.6	7.2	1.9	.6
25				16	7.4	3.0	0	0	3.0	4.6	2.4	.2
26				14	8.4	1.9	.2	.9	3.0	5.4	2.4	0
27				12	8.0	3.0	1.0	.9	.8	3.6	2.1	0
28				10	6.8	3.6	0	2.4	.2	6.4	2.1	0
29		—		10	7.4	2.1	0	1.2	1.2	5.2	2.6	0
30		—		8.6	8.6	.1	0	1.2	1.2	1.4	2.1	0
31		—		—	9.4	—	.1	2.8	—	.6	—	0
Mean					9.2	2.9	.7	.6	1.4	3.6	1.7	1.2
Runoff in Ac.Ft.					566	173	42	36	85	218	100	74
	Water Year Total								Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 0.5 mile above the mouth. This creek is an east-side tributary to the Sacramento River at Mile 179.3L. Recorder installed April 14. Period of record 1948 to date. Records for 1949 computed by Division of Water Resources.

TABLE 34

FLOW OF MILL CREEK NEAR MOUTH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					199	152	e4.0	0.1	0.1	3.0	37	105
2					224	128	e3.0	.1	.3	2.8	37	104
3					252	108	e2.0	.1	.4	3.1	39	104
4					208	106	e1.0	.1	.4	3.1	39	102
5					199	120	e.9	.1	.6	3.1	39	111
6					199	118	e.9	.1	.6	3.6	37	110
7					208	114	e.8	.1	1.0	3.4	38	110
8					206	113	e.8	.3	.9	3.9	64	111
9					200	101	e.7	.2	1.6	3.9	148	108
10					217	99	e.7	.2	1.0	4.0	180	108
11					316	91	e.7	.3	1.0	15	139	105
12					322	85	e.6	.4	.6	15	122	101
13					350	76	e.6	.3	.4	14	117	104
14				314	322	68	e.5	.2	.4	10	115	105
15				325	292	63	e.5	.4	.9	9.0	111	110
16				352	283	61	e.5	1.0	1.6	9.5	104	114
17				380	272	53	e.4	.2	1.6	10	102	122
18				377	208	49	e.4	.1	1.5	11	100	128
19				410	173	45	e.4	.1	1.6	13	100	131
20				371	162	e40	.3	.1	1.6	13	100	111
21				371	139	e35	e.3	.8	1.5	15	101	108
22				374	137	e30	e.3	.3	1.7	18	101	113
23				387	150	e25	e.3	.3	1.6	18	101	111
24				345	161	e20	e.2	.3	1.5	21	105	111
25				310	173	e15	e.2	.5	1.5	20	104	110
26				287	178	e10	e.1	.4	1.5	15	102	110
27				280	175	e8.0	.1	.4	1.3	17	102	108
28				254	168	7.7	.2	.3	1.0	17	110	108
29		—		252	161	e6.0	.3	.3	2.0	21	116	108
30		—		216	164	e5.0	.3	.3	3.0	35	108	108
31		—		—	169	—	.1	.3	—	35	—	105
Mean					212	65.0	.7	.3	1.2	12.4	93.9	110
Runoff in Ac.Ft.					13060	3871	44	17	69	764	5589	6752
	Water Year Total								Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 0.8 mile above the mouth. Mill Creek is an east-side tributary to the Sacramento River at Mile 178.0L. Recorder installed April 14. Period of record 1948 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 35

FLOW OF THOMES CREEK AT PASKENTA - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	100	24	280	442	370	185	22	7.0	1.0	1.0	3.3	16
2	90	24	433	519	411	167	19	7.5	1.0	1.0	3.3	15
3	80	26	514	540	393	153	18	7.5	1.0	1.0	3.6	14
4	75	28	383	547	353	143	18	5.7	1.0	1.0	4.0	14
5	70	28	423	650	331	140	19	5.3	1.0	1.0	4.8	15
6	85	30	320	766	320	134	19	4.8	1.0	1.0	4.8	18
7	98	40	256	856	336	130	19	4.4	1.2	1.0	16	17
8	85	40	225	811	348	115	18	3.6	1.0	1.5	24	19
9	70	45	350	874	320	104	16	3.6	.8	2.0	36	19
10	60	67	901	1110	375	96	15	3.3	1.2	2.5	61	18
11	55	171	976	1340	484	87	12	3.3	1.2	3.0	36	17
12	55	95	456	1260	449	82	12	3.0	1.5	2.8	24	15
13	50	75	358	1090	449	74	11	3.0	1.5	2.0	18	15
14	40	69	358	990	429	69	10	2.8	1.5	2.0	18	15
15	35	67	630	1030	370	64	9.3	2.8	1.5	2.0	20	17
16	35	64	865	1130	348	59	8.6	3.0	1.5	2.0	20	16
17	32	69	926	1170	305	53	8.0	3.0	1.2	2.0	20	16
18	32	85	1480	1050	295	51	8.0	2.8	1.0	2.3	19	16
19	35	107	1420	874	256	51	7.5	2.5	.7	2.5	18	17
20	35	130	1080	766	225	51	7.5	2.0	.6	2.5	18	16
21	32	130	829	820	209	51	7.5	2.0	.4	2.5	17	13
22	32	454	714	811	205	45	7.5	1.5	.3	2.5	17	15
23	32	644	612	739	205	38	7.0	1.5	.3	3.0	16	14
24	32	370	533	650	205	33	7.0	1.8	.2	3.6	18	15
25	30	320	456	561	205	33	6.6	1.8	.2	3.6	17	16
26	30	370	435	505	205	32	6.6	1.8	.6	4.0	17	15
27	28	358	598	484	197	30	6.6	1.6	1.2	4.0	17	15
28	28	320	605	477	181	27	7.0	1.4	1.2	4.4	17	15
29	26	—	519	442	230	24	6.1	1.2	1.5	4.4	17	15
30	26	—	498	387	225	23	6.1	1.1	1.2	3.3	16	16
31	24	—	456	—	189	—	6.1	1.0	—	3.3	—	16
Mean	49.6	152	609	790	304	78.1	11.3	3.15	.98	2.41	18.0	15.8
Runoff in Ac.Ft.	3050	8430	37470	46990	18690	4650	690	194	59	148	1070	972
	Water Year Total 132653								Calendar Year Total 122413			

U. S. Geological Survey and Division of Water Resources cooperative station located 0.5 mile upstream from Paskenta. Thomes Creek is a west-side tributary to the Sacramento River at Mile 173.2R. Drainage area is 188 square miles. Period of record 1920 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 36

FLOW OF CHAMPLIN SLOUGH NEAR MOUTH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					2.9	3.1	0.4	0.4	0.4	2.5	1.6	1.3
2					3.5	3.1	1.1	.4	1.4	4.0	2.4	1.3
3					3.4	2.9	1.8	.4	.4	2.7	2.1	1.4
4					3.5	3.4	1.7	.4	.4	1.8	2.9	1.4
5					3.2	3.4	2.0	.4	.5	4.7	2.0	1.4
6					2.7	2.4	1.0	.4	1.4	5.8	3.1	1.4
7					2.6	2.4	1.0	.4	.4	4.1	1.6	1.4
8					1.8	2.8	.4	.7	1.1	3.5	2.1	1.5
9					3.1	1.4	.6	.7	3.6	5.4	2.6	1.4
10					2.4	2.6	.4	.7	4.6	6.0	2.6	1.2
11					2.1	2.4	.7	.6	2.2	5.2	1.8	1.3
12					1.6	2.2	.9	.7	2.4	3.5	1.7	1.4
13					1.4	1.8	.8	1.0	.6	3.4	1.6	1.4
14					1.2	1.4	.4	.4	.7	2.2	1.6	1.5
15				2.4	2.6	1.6	.3	.4	2.8	1.4	1.6	1.6
16				2.4	2.6	1.8	.4	1.0	3.6	2.6	1.4	1.4
17				3.2	3.2	1.6	.3	.8	4.1	2.8	1.4	1.5
18				3.1	3.3	1.6	.3	2.0	3.7	3.1	1.2	1.4
19				3.4	2.8	2.5	.3	.4	1.7	2.8	1.3	1.4
20				3.7	3.6	2.4	1.1	.7	2.2	2.2	.9	1.2
21				3.4	3.4	2.4	.8	.4	2.7	2.5	.7	1.1
22				3.7	2.9	2.7	.8	.4	3.0	2.4	.9	1.3
23				3.7	5.4	2.6	.6	.4	2.7	3.1	1.2	1.2
24				3.4	3.4	2.4	.4	.4	3.5	2.6	1.2	1.1
25				2.9	3.6	2.4	.4	.4	2.6	2.4	1.2	1.3
26				2.4	2.4	2.0	.4	.4	4.1	1.3	1.2	1.3
27				2.8	3.0	1.4	.5	.4	4.7	2.1	1.2	1.3
28				3.5	2.4	1.3	.5	.4	3.8	2.4	1.2	1.3
29		—		4.1	2.9	1.3	.4	.6	5.2	1.7	1.2	1.3
30		—		3.2	3.6	1.1	.4	.4	3.5	3.5	1.1	1.3
31		—		—	2.9	—	.4	1.0	—	2.6	—	1.2
Mean					2.9	2.2	.7	.6	2.5	3.1	1.6	1.3
Runoff in Ac.Ft.					177	132	43	36	147	191	96	82
	Water Year Total								Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 1.1 miles above its confluence with Toomes Creek, to which it is tributary at a point 0.4 mile above the mouth of Toomes Creek. Recorder installed April 14. Period of record 1948 and 1949. Records for 1949 computed by Division of Water Resources.

TABLE 37

FLOW OF TOOMES CREEK NEAR MOUTH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					5.9					0	4.9	
2					5.3					0	4.9	
3					5.5					1.5	4.9	
4					5.6					3.0	4.9	
5					6.1					4.6	4.9	
6					5.5					4.7	4.9	
7					4.9					e4.7	5.0	
8					4.8					e4.7	5.0	
9					4.8					e4.8	6.0	
10					4.8					e4.8		
11					4.8					e4.8		
12					4.9	N	N	N	N	e4.9		
13					4.8	O	O	O	O	e4.9		
14					4.9					e4.9		
15				4.8	4.9					4.9		
16				4.8	4.9					4.8		
17				4.9	4.8	F	F	F	F	4.7		
18				5.0	4.8	L	L	L	L	4.6		
19				5.1	5.0	O	O	O	O	4.6		
20				5.2	5.2	W	W	W	W	4.6		
21				5.0	5.8					4.6		
22				4.9	5.3					4.6		
23				4.9	5.0					4.7		
24				5.0	4.7					4.7		
25				4.9	4.7					4.8		
26				4.9	4.7					5.0		
27				4.8	4.8					5.0		
28				4.8	4.8					4.9		
29		—		5.7	3.0					4.9		
30		—		6.0	2.0					4.9		
31		—		—	0	—			—	4.9	—	
Mean					4.7	0	0	0	0	4.3		
Runoff in Ac.Ft.					292	0	0	0	0	265		
		Water Year Total							Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 0.6 mile above the mouth. Toomes Creek is an east-side tributary to the Sacramento River at Mile 171.0L. Station operated only during irrigation season. Recorder installed April 15 and removed November 10. Flows shown are partially estimated as this station is affected by backwater from the Sacramento River most of the year. Period of record 1948 and 1949. Records for 1949 computed by Division of Water Resources.

e Estimated.

TABLE 38

FLOW OF DEER CREEK NEAR VINA - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	122	99	202	261	289	176	92	81	77	76	78	83
2	126	101	891	273	306	153	92	80	77	74	78	81
3	110	103	1090	280	364	145	92	77	76	74	78	81
4	98	107	667	296	302	140	92	77	76	73	78	81
5	114	110	436	320	276	145	92	77	76	74	78	89
6	120	110	387	345	258	150	92	78	76	74	78	87
7	110	118	313	379	252	160	92	78	76	77	80	87
8	109	114	320	364	252	155	91	78	76	77	84	87
9	105	114	358	383	246	145	91	78	77	77	138	84
10	105	130	1500	419	252	145	89	78	77	78	164	83
11	98	260	2380	481	255	140	87	80	77	84	120	80
12	110	142	1250	524	246	135	87	80	76	78	101	77
13	126	118	685	514	286	135	86	80	76	77	92	80
14	112	120	509	490	264	130	86	80	76	77	89	81
15	103	120	458	476	249	125	84	80	74	77	87	84
16	101	114	617	495	237	125	84	80	74	77	87	87
17	101	122	585	524	220	120	83	80	74	77	86	99
18	101	136	544	519	218	115	83	80	74	77	84	105
19	103	142	1080	590	202	115	81	78	73	77	84	101
20	103	174	764	529	194	110	81	78	73	80	84	84
21	107	218	580	481	186	110	81	78	71	80	83	84
22	116	310	514	467	176	105	81	78	73	80	83	84
23	105	339	441	472	169	105	81	78	73	80	83	84
24	96	246	387	432	162	105	81	78	73	80	84	84
25	105	232	334	395	158	100	81	78	73	80	84	83
26	99	226	306	364	153	100	80	78	74	80	84	83
27	107	218	302	345	149	98	80	77	76	80	84	81
28	103	207	320	334	147	98	80	78	77	80	86	81
29	101	—	296	353	158	96	80	83	77	80	87	83
30	99	—	289	306	181	94	80	81	77	78	84	83
31	99	—	267	—	179	—	80	78	—	78	—	81
Mean	107	162	615	414	225	126	85.2	78.8	75.2	77.8	89.7	84.9
Runoff in Ac.Ft.	6570	9020	37830	24620	13860	7490	5240	4850	4470	4780	5340	5220
	Water Year Total 134730								Calendar Year Total 129290			

U. S. Geological Survey and Division of Water Resources cooperative station located 9 miles northeast of Vina and 0.8 mile upstream from a diversion dam. Deer Creek is an east-side tributary to the Sacramento River at Mile 168.5L. Drainage area is 200 square miles. Period of record 1911 to 1915; 1920 to 1937; 1939 to date.

TABLE 39

FLOW OF DEER CREEK NEAR MOUTH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					165	105						
2					165	92						
3					220	81						
4					177	66						
5					156	54						
6					132	47						
7					121	38						
8					124	36						
9					125	40						57
10					121	28						57
11					125	16						52
12					122	14						43
13					144	19						48
14				342	142							52
15				330	136							62
16				342	133							62
17				374	120							78
18				378	120							90
19				398	115							98
20				395	104							74
21				348	100							64
22				328	95							66
23				324	89							52
24				302	84							45
25				272	89							45
26				243	99							45
27				212	104							45
28				177	105							45
29		—		187	95							45
30		—		175	100							45
31		—		—	101	—			—		—	45
Mean					123		*.6	*.3	*.3	*5.0	*5.0	
Runoff in Ac.Ft.					7593							
		Water Year Total							Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 0.7 mile above the mouth. Deer Creek is an east-side tributary to the Sacramento River at Mile 168.5L. Recorder installed April 14, removed June 13 because of channel and levee work done by the Corps of Engineers, and reinstalled December 9. Period of record 1948 to date. Records for 1949 computed by Division of Water Resources.

* Estimates based on observations made during each month.

TABLE 40

FLOW OF CHICO CREEK NEAR CHICO - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	54	32	122	141	49	42	24	21	19	21	21	23
2	70	34	498	135	49	37	24	21	19	21	21	23
3	56	36	753	133	53	34	24	20	19	21	22	23
4	48	38	429	131	46	33	24	20	19	21	22	23
5	47	41	320	133	42	32	23	19	19	21	22	25
6	46	47	270	135	38	31	23	19	19	21	22	29
7	44	48	232	144	42	31	23	19	19	21	22	28
8	41	44	208	144	40	30	22	20	20	21	23	28
9	40	43	235	137	45	29	22	20	21	21	50	26
10	29	48	792	137	45	28	22	20	21	21	66	25
11	35	113	1550	141	52	28	22	20	21	21	38	24
12	38	74	893	144	52	28	22	20	21	21	29	23
13	39	56	560	135	49	26	22	20	21	21	25	24
14	38	54	410	131	47	26	22	20	21	21	25	24
15	34	50	350	123	46	28	22	20	20	21	24	28
16	33	47	435	117	46	28	21	20	20	21	23	30
17	33	48	462	113	43	26	21	20	20	21	23	42
18	33	54	425	109	46	26	21	19	20	21	22	49
19	34	62	610	105	45	26	21	19	20	21	22	52
20	34	81	588	98	43	28	21	19	20	21	22	37
21	35	111	440	94	41	28	21	18	20	21	22	31
22	47	176	380	89	40	25	21	18	20	20	23	30
23	34	266	332	83	38	24	21	19	20	20	23	28
24	29	190	290	80	37	26	21	19	20	20	24	28
25	30	175	248	71	36	22	21	19	20	20	24	28
26	34	163	215	66	32	22	21	19	21	20	23	26
27	34	151	198	62	29	23	21	19	21	20	23	26
28	33	137	193	59	33	24	21	20	21	20	23	26
29	32	—	176	60	40	25	21	20	21	21	23	26
30	32	—	161	53	47	25	21	20	21	21	23	26
31	32	—	148	—	42	—	21	19	—	21	—	25
Mean	38.6	86.4	417	110	43.0	28.0	21.8	19.5	20.1	20.8	25.8	28.6
Runoff in Ac.Ft.	2380	4800	25630	6550	2640	1670	1340	1200	1200	1280	1540	1760
			Water Year Total	54060					Calendar Year Total	51990		

U. S. Geological Survey and Division of Water Resources cooperative station located 6 miles northeast of Chico. Chico Creek is an east-side tributary to the Sacramento River at Mile 141.5L. Drainage area is 68.3 square miles. Period of record 1930 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 41

FLOW OF CHICO CREEK NEAR MOUTH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					38	20						0
2					37	19						0
3					41	15						0
4					35	14						0
5					30	12						0
6					24	12						0
7					28	11						0
8					22	11						0
9					24	12						0
10					23	7.2						0
11					25	7.8						0
12					29	6.8	N	N	N	N	N	0
13					27	6.0	0	0	0	0	0	0
14					25	5.2						0
15					24	5.0						0
16					27	6.8						0
17					25	1.5	F	F	F	F	F	0
18					27	3.4	L	L	L	L	L	0
19					28	5.0	0	0	0	0	0	6.5
20				66	27	5.8	W	W	W	W	W	11
21				71	25	5.8						6.4
22				67	23	5.0						3.2
23				64	20	6.3						2.5
24				61	18	0						.8
25				55	18	2.6						0
26				54	17	0						0
27				49	10	0						0
28				44	13	0						0
29		—		49	18	0						0
30		—		42	26	1.8						0
31		—		—	24	—			—		—	0
Mean					25.1	6.9	0	0	0	0	0	1.0
Runoff in Ac.Ft.					1543	412	0	0	0	0	0	60
	Water Year Total								Calendar Year Total			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located approximately 1.5 miles above the mouth. Chico Creek is an east-side tributary to the Sacramento River at Mile 141.5L. Recorder installed April 19. Period of record 1948 to date. Records for 1949 computed by Division of Water Resources.

TABLE 42

FLOW OF STONY CREEK NEAR HAMILTON CITY - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		0	142	508	139	45						
2		0	146	483	151	52						
3		0	669	493	164	39						
4		0	1030	508	172	30						
5		0	1000	458	159	22						
6		0	1120	463	124	17						
7		0	623	584	99	13						
8		0	518	776	73	17						
9		0	428	770	60	26						
10		0	5000	686	57	28						
11		0	6840	776	41	21						
12	N	0	4960	842	36	17	N	N	N	N	N	N
13	0	0	1560	824	43	6.6	0	0	0	0	0	0
14		0	1170	752	50	0						
15		0	1470	698	57	0						
16		0	2310	686	83	0						
17	F	0	2460	728	93	0	F	F	F	F	F	F
18	L	0	2790	764	76	0	L	L	L	L	L	L
19	0	0	3120	770	90	0	0	0	0	0	0	0
20	W	0	3290	704	75	0	W	W	W	W	W	W
21		0	2760	601	65	0						
22		0	2330	548	60	0						
23		0	1880	508	50	0						
24		92	2180	428	45	0						
25		123	1010	368	40	0						
26		133	716	268	35	0						
27		141	669	210	39	0						
28		144	716	201	45	0						
29		—	830	201	63	0						
30		—	652	159	68	0						
31		—	553	—	55	—			—		—	
Mean	0	22.6	1772	559	77.6	11.1	0	0	0	0	0	0
Runoff in Ac.Ft.	0	1260	109000	33250	4770	662	0	0	0	0	0	0
	Water Year Total 148942								Calendar Year Total 148942			

U. S. Geological Survey and U. S. Army Corps of Engineers cooperative station located about 5 miles above the mouth and above the Glenn-Colusa Irrigation District canal crossing. The flow to the Sacramento River is cut off during irrigation season by an earth fill installed by Glenn-Colusa Irrigation District to transport water from their main canal across Stony Creek. Stony Creek is a west-side tributary to the Sacramento River at Mile 136.3R. Water diverted from Stony Creek by G.C.I.D. in acre-feet amounted to: April 26317, May 4770, June 662. Drainage area is 761 square miles. Period of record 1941 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 43

FLOW OF BUTTE CREEK NEAR CHICO - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	142	58	243	413	435	283	136	122	87	100	87	105
2	164	94	613	398	462	224	130	119	102	94	100	122
3	130	108	976	440	468	227	108	124	92	100	87	102
4	124	124	617	451	430	213	116	127	90	92	87	87
5	119	130	520	474	408	231	133	116	92	100	97	110
6	127	130	468	491	413	202	136	119	97	100	92	102
7	108	152	424	497	403	213	116	116	87	100	92	119
8	113	136	403	508	388	192	113	116	105	90	90	105
9	119	136	419	520	393	188	116	110	80	92	213	110
10	82	142	1080	557	378	192	87	108	62	92	278	100
11	75	274	2120	582	393	188	116	122	60	97	185	102
12	94	164	1350	608	393	181	108	122	80	94	136	100
13	116	133	860	602	408	175	108	116	77	97	113	92
14	127	133	641	595	403	161	108	127	92	87	116	97
15	110	139	582	608	383	142	102	108	84	90	116	113
16	100	124	718	622	349	158	100	97	90	87	116	105
17	100	130	790	641	349	155	80	116	82	87	113	171
18	102	133	776	615	358	155	108	102	84	92	110	152
19	92	139	1000	641	326	175	97	110	90	108	116	178
20	92	161	940	622	308	168	90	82	75	97	113	110
21	113	202	776	615	295	155	116	108	87	100	108	127
22	127	249	732	615	278	133	130	102	92	92	102	113
23	100	419	662	622	274	130	119	102	66	90	108	108
24	100	312	602	608	270	155	133	102	84	100	108	102
25	94	299	539	557	266	155	130	92	80	90	108	110
26	124	287	479	532	266	142	97	97	90	92	108	97
27	122	278	451	508	254	136	130	92	92	92	108	110
28	113	258	503	497	247	127	90	110	87	94	108	100
29	108	—	485	485	254	136	87	113	97	94	116	102
30	108	—	419	451	312	136	116	105	100	87	100	100
31	82	—	408	—	274	—	119	90	—	92	—	100
Mean	111	180	697	546	350	174	112	109	86.1	94.2	118	111
Runoff in Ac.Ft.	6800	10000	42840	32480	21500	10370	6890	6730	5120	5790	7000	6840
	Water Year Total 169400								Calendar Year Total 162360			

U. S. Geological Survey and Division of Water Resources cooperative station located 0.8 mile downstream from Little Butte Creek and 7.5 miles east of Chico. Butte Creek is a tributary to the Sacramento River, via Butte Slough, at Mile 84.0L, (See notes on Tables 46 and 57). Drainage area of Butte Creek near Chico is 148 square miles and period of record 1930 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 44

FLOW OVER MOULTON WEIR FROM SACRAMENTO RIVER TO BUTTE BASIN - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			0									
2			0									
3			0									
4			0									
5			0									
6			0									
7			0									
8			0									
9			0									
10			0									
11			80									
12	N	N	3800	N	N	N	N	N	N	N	N	N
13	0	0	2120	0	0	0	0	0	0	0	0	0
14			0									
15			0									
16			0									
17	F	F	0	F	F	F	F	F	F	F	F	F
18	L	L	0	L	L	L	L	L	L	L	L	L
19	O	O	0	O	O	O	O	O	O	O	O	O
20	W	W	0	W	W	W	W	W	W	W	W	W
21			0									
22			0									
23			0									
24			0									
25			0									
26			0									
27			0									
28			0									
29		—	0									
30		—	0									
31		—	0	—		—			—		—	
Mean	0	0	194	0	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	11900	0	0	0	0	0	0	0	0	0
	Water Year Total 11900								Calendar Year Total 11900			

Elevation of crest is 76.75 U.S.E.D. datum; length of crest is 500 feet. Weir is on left bank at Mile 104.0. Period of record 1940 to date. Records for 1949 computed by Division of Water Resources.

TABLE 45

FLOW OVER COLUSA WEIR FROM SACRAMENTO RIVER TO BUTTE BASIN - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			0									
2			0									
3			0									
4			340									
5			622									
6			0									
7			0									
8			0									
9			0									
10			0									
11			3616									
12	N	N	43800	N	N	N	N	N	N	N	N	N
13	O	O	43800	O	O	O	O	O	O	O	O	O
14			3328									
15			0									
16			0									
17	F	F	0	F	F	F	F	F	F	F	F	F
18	L	L	0	L	L	L	L	L	L	L	L	L
19	O	O	611	O	O	O	O	O	O	O	O	O
20	W	W	5072	W	W	W	W	W	W	W	W	W
21			4956									
22			152									
23			0									
24			0									
25			0									
26			0									
27			0									
28			0									
29		—	0									
30		—	0									
31		—	0	—		—			—		—	
Mean	0	0	3429	0	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	210800	0	0	0	0	0	0	0	0	0
	Water Year Total 210800								Calendar Year Total 210800			

Elevation of crest is 61.80 U.S.E.D. datum; length of crest is 1650 feet. Weir is on left bank at Mile 92.4. Period of record 1940 to date. Records for 1949 computed by Division of Water Resources.

TABLE 46

FLOW OF BUTTE SLOUGH TO SACRAMENTO RIVER - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	570	1320	742	745	41	755	115	132	290	e319	60	28
2	487	1060	725	249	40	786	116	179	396	e249	115	30
3	214	788	0	665	94	803	146	218	334	180	111	e28
4	431	722	0	557	127	678	193	221	392	e120	130	27
5	526	713	0	565	130	534	201	208	402	e62	e128	30
6	487	298	0	549	133	523	184	204	472	0	114	25
7	441	981	0	535	187	386	106	196	456	93	125	12
8	477	1090	0	535	237	271	102	197	429	e93	e122	0
9	595	705	291	516	227	255	210	208	584	e93	119	0
10	891	665	0	487	250	230	195	222	548	93	135	0
11	935	878	0	472	293	226	145	201	639	93	362	0
12	846	0	0	451	408	228	126	216	545	e62	e377	0
13	866	456	0	386	489	225	120	230	1020	0	e308	0
14	945	916	0	462	540	223	88	231	e1070	0	312	0
15	958	1010	0	467	624	145	80	252	e1070	e62	338	0
16	843	812	0	516	1000	82	73	263	e1040	57	298	0
17	948	717	0	557	775	90	59	267	e1010	41	319	0
18	895	984	0	387	818	128	72	272	e1010	14	241	0
19	660	973	0	270	803	131	79	269	e981	35	e214	50
20	742	1020	0	413	881	133	61	256	e920	0	e198	73
21	757	1040	0	428	888	157	56	273	e853	0	180	71
22	752	657	0	217	875	185	55	270	e818	0	190	73
23	737	386	0	266	705	177	55	260	e818	0	171	71
24	1190	0	0	243	798	184	62	260	e745	0	e130	e72
25	1310	0	0	199	898	199	88	264	e665	4.9	80	e72
26	1100	392	0	100	811	215	92	277	e662	28	e61	e73
27	1040	549	0	36	723	242	76	332	e579	e29	e61	73
28	978	617	436	37	715	217	72	296	e535	e30	62	108
29	923	—	520	53	698	167	73	295	e436	42	78	124
30	930	—	674	47	716	118	128	297	e381	e87	9.3	118
31	1200	—	788	—	597	—	144	305	—	86	—	e119
Mean	796	705	135	380	533	290	109	244	670	63.6	172	41.2
Runoff in Ac.Ft.	48940	39170	8283	22630	32770	17240	6688	15020	39870	3913	10210	2533
	Water Year Total 266241								Calendar Year Total 247267			

This is the discharge to the Sacramento River at Mile 84.0L and is measured at and regulated by the gravity culverts at the mouth of the slough. These flows, together with those shown in Tables 57 and 58 are, during the summer months, made up almost entirely of return water from lands irrigated by Feather River diversions. Discharge from the Sacramento to Butte Basin over Moulton and Colusa weirs is shown in Tables 44 and 45. This is a Division of Water Resources station. Period of record 1924 to date.

e Estimated.

TABLE 47

FLOW OF RECLAMATION DISTRICT 70 DRAIN - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	6.3	9	52	67	32	33	67	78	13	0	13
2	22	6.3	0	22	68	35	34	64	85	13	0	13
3	0	0	0	12	62	39	44	70	91	13	0	13
4	0	0	0	0	64	36	44	68	84	0	0	13
5	0	0	0	0	60	39	43	66	89	0	0	13
6	5.8	0	0	0	65	28	44	66	117	0	9.5	0
7	5.8	0	11	0	62	30	43	66	106	8.6	8.6	0
8	5.8	0	39	43	24	30	52	65	122	7.7	14	6.5
9	5.8	5.0	0	22	33	44	56	68	115	7.2	4.8	0
10	5.8	0	0	0	57	40	63	68	136	6.5	0	2.8
11	2.5	0	0	0	44	36	61	69	98	4.1	0	6.5
12	2.5	0	39	0	46	38	60	71	90	4.6	0	9.3
13	2.5	0	67	0	42	38	58	71	83	4.3	0	9.3
14	0	0	25	9.2	50	40	58	74	87	4.9	0	0
15	0	0	38	9.3	56	40	59	74	75	5.4	26	0
16	0	0	70	13	38	37	53	75	74	5.4	27	0
17	0	2.4	67	26	33	36	59	76	45	5.8	28	13
18	0	5.6	21	28	32	36	58	77	54	0	40	6.5
19	0	5.6	64	29	22	43	54	75	42	0	42	0
20	0	5.6	59	27	34	47	50	77	38	0	44	0
21	0	2.4	52	32	60	47	50	78	33	0	45	6.5
22	0	0	17	38	64	51	53	78	29	0	45	2.8
23	0	0	42	46	66	52	51	80	23	0	38	6.5
24	0	0	30	52	53	51	58	80	20	0	20	9.3
25	0	0	50	68	52	45	58	84	18	0	20	6.5
26	31	0	24	73	40	41	65	90	12	0	13	6.5
27	9.0	0	36	76	44	40	63	119	12	0	9.3	6.5
28	6.3	16	43	66	36	40	63	104	12	0	9.3	6.5
29	6.3	—	31	70	46	31	60	93	9	0	13	6.5
30	6.3	—	24	65	42	32	58	97	12	0	13	6.5
31	6.3	—	45	—	33	—	67	70	—	0	—	6.5
Mean	4.0	2.0	29.1	29.3	48.2	39.1	54.1	76.8	63.0	3.4	15.7	6.1
Runoff in Ac.Ft.	246	111	1791	1742	2965	2329	3326	4721	3747	206	932	377
	Water Year Total 22041								Calendar Year Total 22493			

This is the drainage from Reclamation District 70 returned to the Sacramento River at Mile 68.8L. This is a combination irrigation and drainage plant and discharges both to the Sacramento River and to an irrigation canal. The above flow includes gravity as well as pumped drainage. Period of record 1924 to date. Records for 1949 computed by Division of Water Resources.

TABLE 48

FLOW OVER TISDALE WEIR FROM SACRAMENTO RIVER TO SUTTER BY-PASS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			0									
2			0									
3			0									
4			1000									
5			5900									
6			1900									
7			4									
8			0									
9			0									
10			0									
11			1540									
12	N	N	13100	N	N	N	N	N	N	N	N	N
13	0	0	13100	0	0	0	0	0	0	0	0	0
14			8700									
15			3100									
16			1000									
17	F	F	2250	F	F	F	F	F	F	F	F	F
18	L	L	2250	L	L	L	L	L	L	L	L	L
19	0	0	3100	0	0	0	0	0	0	0	0	0
20	W	W	7200	W	W	W	W	W	W	W	W	W
21			8700									
22			6500									
23			3100									
24			4200									
25			2250									
26			250									
27			0									
28			0									
29		—	0									
30		—	0									
31		—	0	—		—			—		—	
Mean	0	0	2876	0	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	176800	0	0	0	0	0	0	0	0	0
	Water Year Total 176800								Calendar Year Total 176800			

Elevation of crest is 45.45 U.S.E.D. datum; length of crest is 1155 feet. Weir is on left bank at Mile 64.2L. Period of record 1940 to date. Records for 1949 computed by Division of Water Resources.

TABLE 49

FLOW OF RECLAMATION DISTRICT 108 DRAIN AT ROUGH AND READY BEND - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	121	0	0	69	267	367	258	362	427	78	0	0
2	0	0	0	0	162	415	277	366	414	0	0	0
3	3	0	98	68	164	325	260	366	402	56	0	0
4	101	83	0	0	219	204	251	362	490	0	0	81
5	0	0	0	86	216	274	252	326	527	58	0	0
6	0	94	157	0	279	245	246	326	486	17	94	0
7	88	0	104	0	275	205	290	326	476	0	0	0
8	0	0	0	102	483	230	260	331	486	0	0	0
9	119	0	127	0	279	211	282	331	634	0	0	0
10	0	84	140		279	252	274	331	427	92	0	0
11	0	0	206	0	335	255	258	362	508	0	88	0
12	0	0	170	0	410	240	249	366	317	0	0	0
13	0	98	360	0	428	256	298	380	317	0	0	0
14	62	0	133	0	441	246	253	383	315	0	0	0
15	0	0	125	0	653	252	252	374	343	80	0	0
16	112	0	116	0	418	230	258	383	312	0	0	0
17	0	0	100	0	434	232	300	383	250	0	0	66
18	0	86	97	105	434	221	254	383	238	69	0	0
19	0	0	111	105	428	221	271	404	208	0	41	0
20	78	0	209	0	441	237	263	421	178	0	101	0
21	0	0	121	106	441	262	261	422	122	46	0	0
22	0	84	123	0	672	307	274	371	114	0	0	0
23	121	0	118	108	424	302	278	383	98	0	0	62
24	0	0	105	177	326	264	277	375	75	43	0	0
25	0	0	97	74	275	302	291	411	50	0	0	0
26	0	0	0	68	367	263	287	412	0	0	0	0
27	107	106	134	110	276	278	302	438	79	0	57	0
28	0	0	0	145	331	270	280	515	0	0	0	106
29	0	—	110	166	331	240	302	428	61	56	0	0
30	108	—	82	144	331	258	302	419	0	0	0	34
31	0	—	99	—	326	—	331	417	—	0	—	0
Mean	33	23	104	54	360	262	274	382	278	19	13	11
Runoff in Ac.Ft.	2017	1260	6430	3239	22170	15600	16840	23520	16570	1180	756	692
	Water Year Total 112156								Calendar Year Total 110274			

This is the drainage from Reclamation District 108 discharged to the Sacramento River at Mile 44.0R. Additional drainage from Reclamation District 108 is sometimes discharged to Back Borrow Pit at Mile 20.2L. Period of record 1924 to date. Records for 1949 computed by Division of Water Resources.

TABLE 50

FLOW OF RECLAMATION DISTRICT 787 DRAIN - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13	Records sufficient to compute only monthly flows.											
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29		—										
30		—										
31		—		—		—			—		—	
Mean					*62.2	176	50.9	69.4	68.3	5.6	0	2.8
Runoff in Ac.Ft.					*2591	10454	3129	4269	4066	346	0	173
	Water Year Total								Calendar Year Total			

This is the drainage from Reclamation District 787 discharged by pumping to the Sacramento River at Mile 37.0R. Additional drainage from Reclamation District 787 via Sycamore Slough, (See Table 55). Period of record 1949. Records for 1949 computed by Division of Water Resources.

* Beginning of record for season.

TABLE 51

FLOW OF COLUSA TROUGH AT COLUSA-WILLIAMS HIGHWAY* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	379	95	e102	2?0	401	1020	565	836	1050	327	263	114
2	323	95	e139	196	485	1040	565	799	1070	313	296	126
3	264	95	e252	171	624	981	543	759	1130	319	310	109
4	203	92	e700	154	647	813	529	748	1210	308	313	109
5	190	90	e2000	144	715	668	557	727	1260	327	346	76
6	184	85	e1600	110	746	603	561	708	1330	355	385	86
7	207	97	e1200	104	587	529	559	689	1350	353	301	83
8	230	93	e1020	125	537	491	591	727	1350	332	365	86
9	220	90	e959	338	591	439	547	748	1340	300	485	70
10	310	85	e1280	399	624	419	593	752	1310	272	533	58
11	537	93	e1800	334	736	413	587	801	1270	272	423	38
12	311	88	2410	313	766	425	559	838	1170	290	315	42
13	165	83	5820	262	771	455	521	855	1130	289	232	42
14	144	80	7480	290	880	353	547	878	1070	290	207	22
15	125	80	5740	381	995	325	569	887	1060	273	264	28
16	119	83	4240	457	1100	340	595	878	1030	218	340	28
17	119	83	2950	503	1190	415	583	883	916	237	294	26
18	126	81	2300	453	1300	349	589	902	792	195	256	61
19	134	76	2000	395	1400	393	569	904	729	158	279	92
20	154	78	1850	277	1450	449	557	893	710	207	289	93
21	137	81	1700	132	1450	469	545	908	647	239	268	90
22	132	78	1510	222	1380	541	559	876	571	251	304	92
23	130	78	1120	230	1210	529	541	866	569	251	273	92
24	119	81	1220	311	1020	515	549	883	519	272	249	107
25	105	81	1240	361	920	545	579	942	545	277	175	116
26	107	e86	995	399	868	535	610	962	543	283	165	95
27	105	e95	620	397	799	553	593	970	511	270	165	97
28	112	e107	495	395	717	561	614	968	433	262	167	98
29	102	—	407	423	783	507	628	948	371	287	137	93
30	104	—	317	365	966	529	710	981	349	341	116	114
31	105	—	258	—	1040	—	822	1040	—	302	—	100
Mean	184	87	1798	295	894	540	582	857	912	280	288	80
Runoff in Ac.Ft.	11310	4818	110500	17580	54990	32140	35770	52670	54240	17200	17140	4925
	Water Year Total 420773								Calendar Year Total 413283			

Division of Water Resources station located 37.0 miles above the mouth of Back Borrow Pit of Reclamation District 108. This is return water flowing in the main drain of Reclamation District 2047; it is drainage chiefly from lands irrigated by Glenn-Colusa, Provident, Princeton-Codora-Glenn, Compton-Delevan, Maxwell and Jacinto Irrigation Districts. Flow reaches Sacramento River, at Mile 34.15R, through the Knights Landing outfall gates via Back Borrow Pit, (See Table 54). Period of record 1924 to date.
* Also known as Colusa Trough at Highway 20 and Colusa Trough at Tahoe-Ukiah Highway.
e Estimated.

TABLE 52

FLOW OF COLUSA TROUGH (BACK BORROW PIT) NEAR COLLEGE CITY - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	417	114	112	417	292	1200	473	899	1170	479	331	154
2	365	108	114	290	329	1200	532	831	1190	409	360	154
3	321	106	199	229	465	1160	526	771	1200	431	378	128
4	259	98	574	204	532	953	529	730	1280	409	375	112
5	226	102	1040	189	598	704	529	720	1370	362	420	104
6	214	90	1390	172	666	625	568	698	1480	392	493	85
7	229	108	1460	148	547	565	520	662	1560	412	437	88
8	242	108	1280	163	465	493	538	694	1570	431	493	90
9	262	102	967	392	511	468	511	730	1590	392	553	76
10	161	96	1280	535	580	445	538	736	1590	344	669	63
11	214	102	2210	403	656	454	568	787	1550	362	556	35
12	266	104	2620	375	790	428	532	817	1480	384	417	20
13	214	100	2920	313	865	437	493	848	1410	386	334	30
14	186	90	3740	339	990	409	482	882	1360	368	279	12
15	170	90	5000	412	1050	347	547	912	1310	357	290	14
16	161	92	5200	535	1200	295	583	912	1280	313	437	16
17	156	98	4880	637	1280	336	586	943	1160	292	417	28
18	163	96	4500	580	1400	310	580	950	1010	287	406	41
19	174	92	4220	538	1520	308	565	916	912	236	392	79
20	189	88	3790	389	1600	365	514	919	878	242	392	120
21	182	90	3390	272	1620	423	520	933	827	277	392	106
22	172	85	3010	236	1600	502	526	936	749	308	456	104
23	165	86	2470	226	1470	496	535	926	710	310	479	106
24	159	85	2220	234	1270	479	544	926	688	323	459	100
25	141	83	2060	331	1110	490	568	994	685	326	349	124
26	132	86	1790	352	1030	499	613	1060	694	326	279	118
27	134	92	1330	355	963	482	601	1120	672	305	246	106
28	139	106	892	362	868	499	598	1070	610	347	232	108
29	122	—	723	395	909	440	610	1100	532	347	209	96
30	118	—	586	339	1060	412	714	1120	511	423	179	118
31	128	—	465	—	1210	—	841	1110	—	426	—	106
Mean	199	96	2143	345	950	541	561	892	1101	355	392	85.2
Runoff in Ac.Ft.	12260	5349	131800	20550	58410	32180	34480	54850	65510	21830	23320	5238
	Water Year Total 474118								Calendar Year Total 465777			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located on Back Borrow Pit of Reclamation District 108 at Mile 22.7. This is return water derived chiefly from lands irrigated by Glenn-Colusa, Provident, Princeton-Codora-Glenn, Compton-Delevan, Maxwell and Jacinto Irrigation Districts. Period of record 1946 to date. Records for 1949 computed by Division of Water Resources.

TABLE 53

FLOW OF KNIGHTS LANDING RIDGE CUT - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.7	0	1.4	492	54	46	48	72	46			
2	3.8	0	.7	291	37	47	58	55	43			
3	2.7	0	2.3	187	36	43	60	44	34			
4	2.1	0	46	137	43	35	63	38	36			
5	1.1	0	479	106	45	26	58	35	42			
6	.4	0	1140	100	32	23	52	38	44			
7	.3	0	1280	94	24	26	45	40	40			
8	.4	0	1240	86	18	25	43	39	38			
9	.5	0	1040	106	18	28	46	40	39			
10	.2	0	863	146	21	39	46	43	40			
11	0	0	1350	168	26	42	48	43	39			
12	.1	0	2180	204	36	40	45	45	36	N	N	N
13	.1	1.3	2470	257	40	40	41	43	30	0	0	0
14	.1	1.0	2730	318	44	39	38	45	26			
15	0	0	3260	318	49	35	46	46	22			
16	0	0	4150	298	57	32	51	43	21			
17	0	0	4730	248	53	30	46	41	18	F	F	F
18	0	0	4920	245	49	32	46	38	13	L	L	L
19	0	0	4820	224	44	33	42	38	8.8	0	0	0
20	0	0	4660	178	39	37	41	40	7.3	W	W	W
21	0	0	4260	131	38	45	43	41	6.5			
22	0	0	3770	90	39	54	43	42	5.4			
23	0	0	3240	66	35	56	43	41	3.9			
24	0	.1	2760	64	30	51	39	41	3.6			
25	0	1.6	2270	62	29	45	41	42	3.0			
26	0	5.3	1890	69	24	46	43	43	3.0			
27	0	6.1	1460	78	25	44	45	50	2.9			
28	0	2.6	1040	92	24	44	45	49	.8			
29	0	—	808	92	24	42	47	48	0			
30	0	—	706	78	29	40	52	46	0			
31	0	—	611	—	41	—	64	45	—		—	
Mean	0.5	0.6	2070	168	35.6	38.8	47.4	43.7	21.7	0	0	0
Runoff in Ac.Ft.	33	36	127300	9967	2188	2311	2912	2686	1294	0	0	0
	Water Year Total 148774								Calendar Year Total 148727			

Knights Landing Ridge Cut diverts water from the Back Borrow Pit of Reclamation District 108 at a point above the Outfall Gates, into the Yolo By-Pass above Elkhorn. Winter flows are uncontrolled. Summer flows for irrigation are controlled at the Outfall Gates and at the junction with Yolo By-Pass by weir boards and gates. This is a Division of Water Resources station. Period of record 1933 to date.

TABLE 54

FLOW OF COLUSA BASIN DRAINAGE TO SACRAMENTO RIVER AT KNIGHTS LANDING - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	517	137	157	355	115	1160	278	628	1000	633	886	186
2	507	125	137	697	67	1190	388	693	1110	579	536	165
3	436	132	0	573	113	1110	402	689	1130	576	451	157
4	358	93	0	497	232	895	415	639	1150	697	421	137
5	333	134	0	449	510	722	391	580	1200	612	417	126
6	287	57	0	329	573	479	383	495	1310	e595	463	112
7	262	122	0	321	495	403	396	500	1420	e626	520	104
8	284	139	0	225	395	342	345	493	1440	e655	536	89
9	306	139	0	249	339	190	333	508	1450	e596	532	83
10	259	76	346	512	331	158	351	570	1460	e523	683	83
11	185	100	0	547	398	227	390	570	1460	e543	728	69
12	276	28	0	325	565	240	373	688	1430	e576	621	55
13	252	0	0	85	750	237	349	680	1380	e579	487	44
14	216	162	0	55	857	230	294	696	1340	e552	385	44
15	194	191	0	396	893	160	265	756	1280	e536	325	47
16	197	165	0	703	958	110	407	852	1280	e466	334	35
17	155	125	0	492	1100	45	416	875	1250	e435	421	21
18	171	117	0	487	1200	23	416	847	1150	e428	428	46
19	200	115	0	467	1360	28	389	843	1060	e352	428	62
20	194	91	0	310	1480	53	345	867	1010	e360	417	71
21	157	113	0	270	1510	104	315	875	976	e410	410	78
22	171	89	0	228	1520	195	315	879	930	e456	417	85
23	147	95	0	222	1490	292	376	870	868	e459	475	80
24	188	0	0	126	1270	332	364	875	851	e478	503	94
25	174	0	0	81	1100	309	378	879	818	e482	475	88
26	152	0	0	18	756	313	392	890	823	e476	381	99
27	155	157	0	22	640	300	406	940	814	e445	315	100
28	174	206	0	56	721	300	409	932	942	e507	273	97
29	139	—	0	154	760	289	419	974	819	e507	243	89
30	142	—	0	165	908	169	482	1000	691	e618	222	94
31	137	—	230	—	1060	—	581	1000	—	e622	—	95
Mean	236	104	28.1	314	789	354	379	762	1128	532	458	88.2
Runoff in Ac.Ft.	14530	5768	1726	18680	48530	21030	23330	46880	67120	32680	27240	5425
	Water Year Total 312264								Calendar Year Total 312939			

This is the drainage from Colusa Basin passing down the Back Borrow Pit of Reclamation Districts 108 and 787 and entering the Sacramento River at Mile 34.15R, just above the Knights Landing gaging station. Flows are controlled at the Knights Landing Outfall Gates and a portion of the flow of the Back Borrow Pit is diverted to the Knights Landing Ridge Cut. This diversion is shown in Table 53. Total flow to Sacramento River is sum of Tables 54 and 55. This is a Division of Water Resources station. Period of record 1924 to date.

e Estimated.

TABLE 55

FLOW OF SYCAMORE SLOUGH INTO COLUSA BASIN DRAIN - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29		—										
30		—										
31		—		—		—			—		—	
Mean	.5	.4	7.3	5.3	9.2	22.4	18.7	19.1	5.4	1.2	.4	.3
Runoff in Ac.Ft.	33	23	448	317	567	1333	1148	1174	323	74	25	17

Records sufficient to compute only monthly flows.

Water Year Total 7223 — Calendar Year Total 5482

This water is discharged from Reclamation District 787 by pumping into Colusa Basin Drain below the Outfall Gates and is not included in the flow shown in Table 54. Daily distribution of flows are not available since the plant operates on an automatic float switch. A small amount of additional drainage by gravity is not included in the above flows. See Table 50 for additional drainage from Reclamation District 787. Period of record 1940 to date. Records for 1949 computed by Division of Water Resources.

TABLE 56

FLOW OVER FREMONT WEIR FROM SACRAMENTO RIVER TO YOLO BY-PASS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			0									
2			0									
3			0									
4			0									
5			0									
6			0									
7			0									
8			0									
9			0									
10			0									
11			0									
12	N	N	0	N	N	N	N	N	N	N	N	N
13	0	0	4010	0	0	0	0	0	0	0	0	0
14			2300									
15			23000									
16			7200									
17	F	F	0	F	F	F	F	F	F	F	F	F
18	L	L	0	L	L	L	L	L	L	L	L	L
19	0	0	0	0	0	0	0	0	0	0	0	0
20	W	W	0	W	W	W	W	W	W	W	W	W
21			0									
22			0									
23			0									
24			0									
25			0									
26			0									
27			0									
28			0									
29		—	0									
30		—	0									
31		—	0	—		—			—		—	
Mean	0	0	1178	0	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	72420	0	0	0	0	0	0	0	0	0

Water Year Total 72420 — Calendar Year Total 72420

Station is located on Sacramento River at Mile 23.0R. Elevation of crest is 33.5 U.S.E.D. datum; length is 9120 feet. Period of record 1947 to date. Records for 1949 computed by Division of Water Resources.

TABLE 57

FLOW OF BUTTE SLOUGH TO SUTTER BY-PASS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	178	14	148	717	154	140	158	188	162	8.6	74	87
2	142	14	126	622	181	139	156	183	160	7.8	79	83
3	154	18	334	547	185	132	165	181	156	6.5	76	77
4	137	20	960	479	160	112	163	180	160	3.4	77	72
5	109	24	1040	426	159	95	155	179	160	3.0	76	68
6	93	41	1130	413	157	99	148	176	171	1.6	60	47
7	84	28	1160	378	181	134	150	171	159	2.3	58	22
8	87	18	1130	350	184	140	168	183	164	2.2	60	24
9	106	31	943	338	164	150	162	184	164	1.3	57	26
10	107	48	882	320	167	140	157	171	148	1.3	59	26
11	83	45	1240	154	183	138	157	187	146	1.6	112	26
12	58	121	6210	167	191	143	179	187	146	0.7	95	32
13	76	217	24300	186	178	150	177	183	123	0.5	71	36
14	92	78	23600	177	179	144	168	156	87	0.4	44	39
15	66	31	15800	151	187	137	171	191	86	0	32	47
16	49	25	10800	139	161	148	162	190	80	0	26	64
17	33	26	7790	126	119	157	175	190	72	0	22	84
18	18	20	5760	113	120	156	176	191	64	1.8	16	129
19	28	14	4370	112	121	149	170	189	56	0.2	11	162
20	48	12	3620	127	123	152	159	193	49	9.7	7.4	123
21	57	12	5670	125	124	157	161	194	36	28	4.4	107
22	55	16	6180	139	123	156	165	189	24	39	2.6	94
23	53	34	5000	189	117	158	169	192	20	51	1.1	79
24	39	188	3740	152	115	163	177	195	18	64	0	64
25	26	340	2760	128	116	159	173	183	17	94	0	71
26	23	218	2100	135	114	166	168	182	14	105	0	83
27	41	133	1660	149	113	164	171	154	13	123	0	92
28	39	153	1380	159	105	156	174	157	9.6	162	0	111
29	24	—	1160	156	102	150	179	171	8.4	159	0	113
30	22	—	1040	148	119	152	179	161	8.4	94	59	113
31	16	—	882	—	131	—	183	161	—	76	—	121
Mean	69.6	69.2	4607	251	146	144	167	181	89.4	33.8	39.3	75.0
Runoff in Ac.Ft.	4280	3846	283300	14940	8991	8600	10260	11150	5319	2078	2340	4610
			Water Year Total	360903					Calendar Year Total		359714	

This is discharge from Butte Slough to Sutter By-Pass. During low flow periods gates at head of Slough are regulated (Table 46) which forces water under Long Bridge as shown in this table. Normal summer flows are primarily from Feather River sources. During flood periods Sacramento River water enters Butte Basin above Butte City by bank spill and over Moulton and Colusa weirs. The purpose of the summer regulation is to make water available for use on Sutter By-Pass lands (below Long Bridge) and Butte Slough Irrigation Company in R. D. 70. This is a Division of Water Resources station. Period of record 1939 to date.

TABLE 58

FLOW OF WADSWORTH CANAL TO SUTTER BY-PASS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	23	22	19	61	74	138	82	94	163	92	89	22
2	25	22	24	58	120	172	92	82	163	92	29	23
3	25	22	46	55	138	155	92	89	156	96	27	22
4	21	22	106	26	114	104	106	86	159	133	25	22
5	24	22	66	e1.0	138	95	101	84	161	136	32	21
6	42	22	50	e1.0	131	89	105	92	135	114	37	20
7	27	27	44	e1.0	112	89	96	90	166	114	42	20
8	26	23	41	e1.0	145	92	92	99	168	102	39	20
9	26	24	49	e1.0	151	99	83	102	156	104	160	20
10	24	24	199	e1.0	143	84	78	106	199	118	104	19
11	23	25	452	e1.0	215	76	67	108	215	108	61	18
12	23	25	526	e1.0	256	81	61	102	226	99	45	10
13	23	25	343	e1.0	275	99	52	108	252	70	40	e0.5
14	22	25	254	e1.0	288	96	57	122	223	64	35	0.6
15	21	25	180	e1.0	260	88	69	140	236	72	33	3.6
16	21	25	163	e1.0	172	94	66	125	211	70	33	2.1
17	20	24	133	2.7	109	84	60	117	204	79	31	7.8
18	20	23	115	0.3	181	82	62	122	184	90	28	9.0
19	21	23	288	10	211	118	56	133	197	89	26	9.0
20	21	23	212	71	234	122	64	133	186	94	26	13
21	21	22	145	140	190	101	70	142	159	94	25	12
22	22	22	126	150	170	102	61	140	156	75	23	10
23	22	21	129	109	156	122	57	123	148	79	23	6.0
24	23	20	105	108	208	108	75	140	142	44	22	6.0
25	24	18	90	101	136	95	78	130	131	55	21	6.0
26	23	18	85	71	103	108	89	122	140	62	20	7.2
27	23	18	79	84	95	108	82	126	140	73	19	10
28	25	19	75	85	76	96	89	163	126	67	18	6.0
29	24	—	70	111	108	94	92	155	84	94	17	2.4
30	23	—	66	74	111	104	86	150	66	94	18	5.4
31	22	—	62	—	106	—	94	131	—	98	—	7.2
Mean	23.5	22.5	140	4.3	159	103	77.9	118	163	89.1	38.2	11.6
Runoff in Ac.Ft.	1448	1252	8612	2638	9731	6139	4763	7252	10020	5476	2277	716
			Water Year Total	61729					Calendar Year Total		60399	

This is the discharge (measured at Weir #4) to the East Borrow Pit of the Sutter By-Pass at Mile 16.0 (north from Chandler). This flow is made up primarily of Feather River drainage or return flows. This flow and flow from Butte Slough (Table 57) makes up the entire Feather River contribution to the Sutter By-Pass. This is a Division of Water Resources station. Period of record 1939 to date.

e Estimated.

TABLE 59

FLOW OF RECLAMATION DISTRICT 1500 DRAIN - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	92	32	64	82	348	361	520	454	559	157	91	47
2	21	64	63	100	354	291	511	448	559	100	93	46
3	155	31	83	246	404	291	500	442	486	147	0	0
4	86	123	45	79	398	291	500	442	486	144	0	0
5	55	71	57	80	552	240	506	460	486	140	0	0
6	39	26	157	80	455	344	526	464	486	93	0	43
7	0	45	54	80	345	331	528	445	559	95	0	0
8	82	38	121	52	366	392	532	454	481	93	0	70
9	40	42	116	0	422	434	511	454	554	93	0	0
10	32	42	289	53	396	446	474	454	554	144	111	0
11	81	45	349	0	407	441	464	465	624	93	0	0
12	0	0	369	0	415	441	467	448	554	93	144	44
13	0	0	505	81	417	457	456	451	554	93	0	42
14	72	0	227	0	359	446	448	447	554	0	64	0
15	41	60	294	29	491	475	457	456	554	0	98	47
16	0	0	291	29	407	495	480	438	481	0	97	0
17	66	32	288	87	405	495	486	460	451	0	0	0
18	59	32	231	80	408	515	466	449	393	0	0	0
19	126	32	276	127	478	515	452	444	586	0	55	0
20	75	32	544	149	485	506	471	462	366	82	54	51
21	94	32	228	161	488	495	478	449	376	85	52	38
22	91	32	294	168	642	506	460	449	360	87	51	0
23	27	48	233	190	465	506	469	474	315	89	0	51
24	90	32	351	204	296	475	463	481	158	89	0	49
25	3.7	30	284	241	142	475	460	463	218	89	51	0
26	32	30	210	236	481	485	466	460	210	89	50	0
27	64	31	248	237	388	475	458	448	163	91	0	0
28	32	32	109	252	388	495	459	457	166	0	49	42
29	32	—	175	358	388	506	458	457	111	0	47	0
30	82	—	58	354	481	515	463	467	163	0	47	0
31	31	—	73	—	481	—	465	358	—	89	—	42
Mean	54.9	36.2	216	128	418	438	479	452	419	73.4	38.5	19.7
Runoff in Ac.Ft.	3373	2011	13260	7607	25690	26060	29460	27770	24930	4512	2289	1214
	Water Year Total 174881								Calendar Year Total 168176			

This is the drainage from Reclamation District 1500 discharged to West Borrow Pit of Sutter By-Pass and thence via Sacramento Slough (in the By-Pass) to Sacramento River, (See Table 60). Drainage is by pumping and gravity. Period of record 1930 to date. Records for 1949 computed by Division of Water Resources.

TABLE 60

FLOW OF SACRAMENTO SLOUGH TO SACRAMENTO RIVER - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	579	251	0	1800	578	737	630	680	1040	381	285	198
2	457	0	395	1360	482	803	661	729	982	282	327	117
3	551	0	0	1240	482	830	699	771	976	257	318	118
4	515	240	0	1010	453	757	701	775	1010	179	256	194
5	497	0	0	1390	497	781	669	774	999	175	258	190
6	422	208	1250	798	668	573	627	749	981	274	256	165
7	355	0	3000	752	687	529	646	742	974	359	257	146
8	595	0	3910	661	607	470	702	745	1040	322	258	225
9	634	0	3790	471	636	488	746	725	995	260	267	200
10	767	210	2850	484	611	484	719	706	1010	266	417	206
11	616	0	*	0	598	518	699	692	1010	249	488	187
12	499	0		0	374	506	688	732	1030	248	516	143
13	506	0		0	636	555	643	764	1070	264	461	161
14	557	0		0	770	562	602	774	1120	242	362	108
15	516	0		734	685	546	573	792	1130	254	335	150
16	388	196		665	1030	542	570	843	1130	205	253	189
17	443	0		728	843	540	586	831	1100	163	0	163
18	436	243		814	844	529	612	879	1300	133	0	166
19	422	0		861	986	526	594	940	808	168	0	0
20	312	0		851	904	550	568	918	932	102	0	0
21	330	0		1050	1030	590	568	880	963	0	136	232
22	376	285		808	1100	552	542	875	842	0	133	340
23	379	216		744	943	580	520	847	736	184	0	294
24	432	326		792	873	615	598	835	589	185	0	244
25	274	458		1050	660	672	630	835	582	112	0	145
26	0	0	*	1110	703	683	657	839	551	143	0	167
27	0	289	3450	930	742	685	641	833	504	224	0	178
28	262	0	4270	818	712	618	613	859	566	275	0	107
29	219	—	4000	734	731	602	638	892	570	172	0	109
30	224	—	3360	674	726	578	631	960	518	144	0	0
31	274	—	2500	—	731	—	652	1080	—	218	—	0
Mean	414	104		778	720	600	633	816	902	208	186	156
Runoff in Ac.Ft.	25460	5796		46270	44280	35700	38930	50170	53670	12770	11070	9604
	Water Year Total								Calendar Year Total			

This is the discharge to the Sacramento River at Mile 21.2L via Sacramento Slough. This is the entire outflow of the Sutter By-Pass area and R.D. 1500. During high water periods the slough is entirely submerged as it lies within the By-Pass area. Sharp rises in river elevation will cause zero or negative flow. See Tables 57, 58, 59, and 48, which, when combined, will give the measured flow entering the By-Pass area. This is a Division of Water Resources station. Period of record 1924 to date.

* By-Pass flooded - flow not confined to slough channel.

TABLE 61

FLOW OF FEATHER RIVER NEAR OROVILLE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1460	2560	3490	5160	7660	3510	2180	2100	1740	927	1140	936
2	1570	2730	5150	5160	8100	3300	2120	2100	1700	1040	1350	984
3	1490	2620	8310	5200	8380	2970	2100	2080	1620	974	1200	767
4	1560	2530	6700	5440	7780	2640	2160	2080	1600	1000	916	614
5	1690	2370	5620	6070	7660	2610	2140	2040	1530	1040	894	1070
6	1900	1930	5090	6280	7500	2970	2120	2060	1550	889	850	1390
7	1770	2660	4450	6780	7540	2790	2110	2060	1270	1040	996	1480
8	1560	2820	4260	7140	7340	2940	2100	2040	1250	1160	1200	1280
9	1420	2610	4060	7780	6660	2820	2120	2020	1200	844	2070	1130
10	1420	2720	6710	8420	6740	3000	2120	2000	1170	992	2540	1200
11	2300	3540	12900	9570	8380	2550	2090	1990	1110	965	1500	958
12	2520	2170	12000	10500	8580	2300	2080	2010	1120	872	1200	1070
13	2630	1670	7300	10700	8420	2470	2080	1980	1120	1030	1240	1190
14	2460	2240	5930	10800	9580	2500	2100	1960	966	933	1100	1510
15	2080	2530	5620	11400	7780	2420	2080	1940	924	915	1160	1350
16	1550	2430	6740	11400	7900	2330	2090	1980	970	946	1090	1350
17	1760	2260	7700	12000	7780	2300	2080	2020	970	987	1140	1160
18	1720	2000	8020	11800	6820	2280	2100	1940	886	1240	1030	1370
19	2030	2050	9570	12800	6100	2220	2090	1900	886	1290	947	1390
20	2350	2060	9660	12300	5620	2250	2090	1900	1040	1380	856	1460
21	2240	2600	8620	12000	5070	2350	2090	1850	984	1180	1150	1150
22	2040	3080	8500	12400	4870	2280	2070	1860	1120	1100	1230	1040
23	1060	4160	7940	12600	5130	2250	2080	1850	1040	1250	1070	975
24	1970	3950	7260	11800	5230	2200	2080	1860	1040	1040	962	880
25	2220	3810	6350	11100	5300	2120	2060	1820	1000	1140	1080	686
26	2280	3720	5790	10400	5230	2100	2080	1780	858	1060	1000	924
27	2370	3540	5720	10000	4810	2140	2070	1780	1110	1070	744	1010
28	2440	3600	5960	9160	4090	2100	2080	1880	1040	1050	829	746
29	2090	—	5860	8900	3830	2130	2100	1840	1110	922	920	902
30	1040	—	5620	7980	3860	2220	2100	1780	1150	1130	811	1160
31	2230	—	5300	—	3570	—	2130	1770	—	1110	—	1020
Mean	1910	2749	6845	9435	6526	2502	2100	1944	1169	1049	1140	1102
Runoff in Ac.Ft.	117500	152600	420900	561400	401300	148900	129100	119500	69570	64490	67860	67740
	Water Year Total 2495000								Calendar Year Total 2320860			

U. S. Geological Survey and Division of Water Resources cooperative station located at highway crossing about 4.5 miles above Oroville on right bank, at Mile 71.0. Drainage area is 3611 square miles. Period of record 1902 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 62

FLOW OF FEATHER RIVER NEAR GRIDLEY - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1370	2230	3080	4760	5160	1290	38	42	86	448	354	861
2	1530	2370	3990	4760	4920	1180	45	52	78	372	495	991
3	1410	2420	7650	4900	5840	1010	53	60	66	429	593	875
4	1480	2280	6860	4930	5160	721	48	59	84	341	401	765
5	1560	2250	5340	5590	5010	570	42	55	114	429	328	778
6	1740	1760	4950	5990	4820	531	39	48	130	303	282	1270
7	1680	2230	4100	6350	4740	651	35	50	171	332	198	1420
8	1490	2590	3880	6770	4550	622	31	52	186	387	332	1250
9	1550	2380	3520	7380	4140	582	30	60	244	401	798	938
10	1240	2360	4680	7970	3990	605	30	57	290	237	2460	991
11	1800	3330	12400	8830	5290	505	35	53	254	391	1590	805
12	2310	2240	11500	9870	5940	341	38	52	251	286	1170	765
13	2420	1750	7800	10100	5940	171	35	53	269	294	1200	946
14	2280	1740	5890	10200	6010	234	32	53	307	299	1040	1130
15	2070	2240	5340	10400	5620	265	42	52	244	251	1120	1100
16	1660	2190	5940	10300	5430	212	48	47	248	244	1050	1200
17	1470	2080	7180	10900	5560	153	47	42	307	162	1070	1140
18	1660	1890	7590	10200	4760	104	44	68	315	209	998	1260
19	1770	1860	8730	10600	4080	80	42	84	303	410	998	1220
20	2040	1840	9430	10400	3540	62	42	60	410	474	882	1260
21	2040	2140	8330	9780	2900	60	41	50	410	516	910	896
22	1950	2380	8160	9870	2730	122	42	50	387	377	1160	861
23	1220	3560	7760	10200	2590	130	36	47	479	387	1160	733
24	1550	3450	7070	9680	2830	107	35	47	405	438	1060	657
25	1930	3320	6200	8840	2880	72	36	47	358	336	976	651
26	2040	3280	5570	8160	2820	47	33	74	349	387	896	526
27	2060	3210	5380	7560	2490	42	31	72	345	294	983	733
28	2140	3050	5480	6610	1940	33	31	59	443	387	727	547
29	1940	—	5510	6480	1560	31	33	132	401	262	924	559
30	1170	—	5280	5480	1610	33	36	127	495	299	847	689
31	1680	—	5000	—	1340	—	41	95	—	336	—	695
Mean	1750	2444	6438	8129	4071	352	38.4	61.2	281	346	900	920
Runoff in Ac.Ft.	107600	135700	395900	483700	250300	20960	2362	3767	16720	21260	53560	56550
	Water Year Total 1741609								Calendar Year Total 1548379			

Division of Water Resources station located at Gridley Bridge, Mile 49.7 above mouth. Period of record 1944 to date.

TABLE 63

FLOW OF FEATHER RIVER AT YUBA CITY (5TH ST. BRIDGE) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1680	2230	3980	5830	5800	1680	182	163	186	869	638	916
2	1730	2570	4170	5770	5340	1520	144	155	186	669	662	1050
3	1770	2640	7360	5740	6060	1230	211	151	203	700	903	1030
4	1760	2610	10400	5630	5810	981	339	151	155	644	959	862
5	1770	2650	8200	6000	5510	650	291	159	182	590	644	725
6	1920	2520	6740	6490	5310	572	334	147	236	706	525	1130
7	1980	2520	5380	6580	5240	608	385	147	272	536	486	1470
8	1840	3210	4640	7130	5110	626	334	155	305	632	459	1620
9	1790	3070	4170	7540	4760	681	207	167	350	738	694	1390
10	1480	2910	4890	8120	4470	596	198	170	411	650	2320	1090
11	1700	3900	11900	8580	5250	725	198	170	572	566	2720	995
12	2240	4140	16200	9680	6160	442	126	170	590	713	1940	769
13	2490	2970	13000	10400	6400	286	27	163	560	542	1720	909
14	2450	2340	8580	10700	6310	178	46	167	525	572	1630	1130
15	2350	2720	6960	10800	6530	296	79	174	514	498	1520	1470
16	2010	2710	6660	10900	6000	355	144	163	520	432	1550	1320
17	1650	2620	7810	11100	6200	272	147	155	514	470	1510	1420
18	1870	2520	8470	11300	5700	219	228	163	578	365	1510	1470
19	1880	2400	9030	11100	5080	228	215	167	542	530	1340	1570
20	2100	2470	11500	11300	4480	224	207	147	650	802	1130	1410
21	2340	2580	10400	10800	3970	186	207	144	750	903	1000	1280
22	2240	3040	9580	10400	3560	178	186	167	650	836	1360	1020
23	1970	3830	9480	10600	3200	228	163	182	719	662	1460	876
24	1440	4350	8860	10600	3300	236	159	170	700	809	1260	675
25	1920	4210	7990	9780	3380	159	178	159	632	713	1120	560
26	2100	4140	7070	9100	3280	147	178	129	566	632	1170	448
27	2150	4090	6530	8200	3020	147	159	140	464	688	1110	454
28	2170	3910	6310	7490	2690	194	147	151	662	584	869	566
29	2250	—	6640	6900	2030	186	159	163	732	656	930	339
30	1850	—	6420	6480	1990	232	182	174	725	481	1030	406
31	1500	—	6150	—	1880	—	186	219	—	620	—	520
Mean	1948	3067	7918	8701	4639	475	192	161	488	639	1206	996
Runoff in Ac.Ft.	119800	170300	486900	517800	285300	28290	11790	9921	29060	39290	71740	61270
	Water Year Total 2027561								Calendar Year Total 1831461			

Division of Water Resources station located at Yuba City-Marysville (5th Street) Bridge, Mile 28.0 above mouth. Backwater from the Yuba River at times affects the state-discharge relationship of this station. Period of record 1944 to date.

TABLE 64

FLOW OF FEATHER RIVER BELOW YUBA RIVER - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												*1380
7												1570
8												1400
9												1170
10												
11												1130
12												1000
13												1110
14												1240
15												1480
16												1400
17												1400
18												1430
19												1500
20												1440
21												1400
22												1290
23												1230
24												1070
25												990
26												970
27												950
28												1030
29		—										900
30		—										950
31		—		—		—			—		—	1050
Mean												
Runoff in Ac.Ft.												
	Water Year Total - - -								Calendar Year Total - - -			

Station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. It is located on the right bank of the Feather River just below the mouth of the Yuba River at Mile 27.0R. Station was installed December 6, 1949. Station is rated at high stages by simultaneously measuring the flows of the Feather River at 5th Street Bridge and the Yuba River at Simpson Lane Bridge. Period of record 1949. Records for 1949 computed by Division of Water Resources.

* Beginning of record.

TABLE 65

FLOW OF FEATHER RIVER BELOW SHANGHAI BEND - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2620	3000	5770	8480	10400	4730	463	280	324	782	676	1070
2	2710	3380	5920	8320	10200	4330	498	288	338	717	717	1120
3	2830	3630	15100	8440	11000	3850	463	308	355	670	838	1150
4	2800	3650	18100	8460	10700	3440	408	308	338	665	922	1040
5	2840	3680	14900	9040	10100	3030	404	288	329	612	728	943
6	3000	3680	11700	9830	9900	2940	386	268	373	688	659	1130
7	2970	3600	9540	10400	9700	2870	355	252	395	583	612	1600
8	2870	4510	8340	11000	9760	2720	355	233	408	624	595	1990
9	2680	4310	7670	11400	9430	2630	386	220	438	682	728	1750
10	2350	4010	8430	12200	8660	2350	373	204	473	682	2170	1220
11	2440	5260	18300	13400	9310	2310	373	224	566	572	3300	1190
12	3190	6130	21800	14900	10900	1980	355	264	612	694	2510	999
13	3540	4600	18500	15700	11600	1720	368	244	601	583	2180	1140
14	3520	3620	12900	16000	11700	1360	377	233	589	578	2150	1320
15	3430	3790	10800	16400	13100	1260	308	256	583	566	2010	1830
16	2980	3810	10600	16600	11900	1240	308	288	572	520	2050	1760
17	2480	3700	12400	17200	12100	1150	324	268	595	508	1980	1760
18	2750	3580	12600	17400	11300	1040	304	244	607	478	2050	1760
19	2770	3470	13000	17200	9780	999	280	244	618	520	1710	1920
20	3070	3620	15600	17200	9000	950	296	248	618	717	1260	1830
21	3360	3850	14900	16500	8070	859	312	230	717	817	1130	1750
22	3270	4440	13500	16300	7220	831	312	217	699	810	1430	1410
23	2970	5400	13800	16700	7010	824	300	268	676	699	1680	1290
24	2090	6380	12900	16800	7230	796	276	296	734	740	1390	1040
25	2560	6230	11500	16000	7470	747	268	292	670	740	1200	915
26	2780	6030	10200	15000	7700	682	284	280	607	659	1210	873
27	2740	5960	9580	13800	7530	636	304	260	572	711	1180	782
28	2740	5740	9400	12900	6790	589	308	244	607	670	1060	936
29	2890	—	9510	12200	5870	543	308	276	711	734	1040	734
30	2660	—	9180	11300	5540	493	329	296	682	607	1200	775
31	2150	—	8840	—	5200	—	296	333	—	653	—	922
Mean	2840	4395	12110	13570	9233	1797	345	263	547	654	1412	1289
Runoff in Ac.Ft.	174600	244100	744400	807400	567700	106900	21190	16170	32540	40230	84030	79260
	Water Year Total 3185900								Calendar Year Total 2918520			

Division of Water Resources station located on the right bank at Mile 23.0 above mouth. Station is rated above 25000 c.f.s. by means of simultaneous measurements of Yuba River and Feather River at Marysville with appropriate time lag between Marysville and Shanghai Bend. Period of record 1944 to date.

TABLE 66

FLOW OF FEATHER RIVER AT NICOLAUS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2640	2640	5970	9120	9940	4300	352	154	200	738	675	1200
2	2940	3190	5900	8800	9660	4000	374	139	193	776	687	1130
3	2980	3450	13400	8780	10100	3570	365	162	196	639	796	1290
4	2790	3550	23200	8780	10300	3180	324	162	200	657	977	1170
5	2810	3720	20800	9090	9630	2780	282	154	183	621	874	1070
6	2920	4060	16800	9840	9260	2570	279	139	211	663	705	1060
7	3130	3840	13500	9900	9020	2500	258	142	249	633	609	1560
8	3070	4650	10700	10800	9100	2470	238	132	278	573	573	1820
9	2840	4620	9120	11500	8930	2330	272	129	301	663	639	1860
10	2760	4220	8990	12300	8180	2130	261	136	340	731	1280	1410
11	2480	4880	18100	13300	8240	2040	251	132	390	597	2930	1330
12	3000	6980	25000	14800	9840	1910	244	139	501	639	2490	1120
13	3460	5170	22000	15900	10700	1660	229	146	501	621	2110	1100
14	3600	4030	16000	16200	10800	1380	261	142	501	519	2050	1350
15	3480	3780	13000	16500	12300	1230	210	142	495	555	1930	1590
16	3220	3880	12000	16800	11400	1200	187	146	501	495	1960	1820
17	2790	3760	13000	17200	11300	1140	193	136	525	438	1900	1730
18	2630	3660	13000	17700	11100	1030	190	139	549	438	1920	2000
19	2850	3550	14000	17400	9490	974	190	146	579	395	1800	2180
20	3000	3630	17000	17600	8620	905	196	152	543	603	1490	2100
21	3220	3840	16000	17000	7880	800	178	144	645	790	1270	1900
22	3380	4790	15000	16300	6880	744	176	144	699	848	1350	1600
23	3280	5360	16000	16600	6480	730	162	157	627	757	1650	1490
24	2490	6670	15000	16700	6540	724	168	167	699	675	1570	1220
25	2490	6660	14000	16000	6860	672	146	167	669	776	1430	1050
26	2710	6420	13000	14700	7200	611	152	157	603	669	1330	1040
27	2770	6300	11000	13400	7100	534	165	154	573	693	1270	874
28	2740	6150	11000	12600	6400	480	176	157	531	712	1270	1020
29	2800	—	11000	11600	5600	449	173	173	687	718	1050	928
30	2830	—	10300	11000	5300	396	181	176	687	663	1290	848
31	2280	—	9650	—	4800	—	184	186	—	585	—	998
Mean	2915	4552	13980	13610	8676	1648	226	150	462	641	1396	1384
Runoff in Ac.Ft.	179300	252800	859700	809700	533500	98060	13920	9230	27480	39430	83060	85110
	Water Year Total 3234390								Calendar Year Total 2991290			

Station is maintained jointly by Division of Water Resources and U. S. Geological Survey. It is located on left bank at Mile 9.3L above mouth. Period of record 1921 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 67

FLOW OF SOUTH HONCUT CREEK AT LA PORTE ROAD - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	55	18	44	49	16	8.0	0					8.0
2	72	17	83	46	16	7.1	0					8.0
3	52	17	1040	41	18	7.6	0					9.0
4	38	23	734	39	17	5.4	0					10
5	32	57	414	36	15	4.6						10
6	28	68	275	36	14	4.6						10
7	26	226	173	34	12	4.1						12
8	24	96	141	30	12	3.7						12
9	22	73	140	29	12	2.9						9.0
10	19	80	372	28	12	1.8						2.9
11	17	454	1430	26	12	1.8						.5
12	16	160	598	25	10	.9						0
13	15	92	264	23	9.0	.2	N	N	N	N	N	0
14	14	69	54	22	9.0	.2	0	0	0	0	0	0
15	12	59	149	21	12	0						0
16	10	51	185	20	12	0	R	R	R	R	R	3.7
17	9.0	51	141	19	14	.1	E	E	E	E	E	19
18	15	55	116	19	14	.2	C	C	C	C	C	14
19	14	54	242	19	16	.1	O	O	O	O	O	34
20	34	55	173	18	30	.8	R	R	R	R	R	24
21	24	76	121	16	23	1.8	D	D	D	D	D	15
22	33	60	e109	16	15	.7						11
23	43	99	335	16	12	.6						9.5
24	34	73	166	16	10	.8						8.5
25	30	71	128	17	9.5	.7						8.0
26	32	59	104	16	8.0	.4						7.1
27	29	67	89	16	8.0	.1						7.1
28	24	51	81	16	8.0	0					8.0	6.7
29	20	—	66	16	8.5	0					8.0	5.8
30	19	—	59	16	8.5	0					8.0	5.8
31	18	—	53	—	8.5	—			—		—	5.8
Mean	26.8	83.2	261	24.7	12.9	2.0						8.9
Runoff in Ac.Ft.	1646	4623	16020	1470	795	117						548
	Water Year Total								Calendar Year Total			

Division of Water Resources station located approximately 8 miles above the mouth. Honcut Creek is an east-side tributary to the Feather River at Mile 43.7L. Drainage area is 68.6 square miles. Period of record 1947 to date.
e Estimated.

TABLE 68

FLOW OF YUBA RIVER AT NARROWS DAM - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	745	505	1370	2020	4330	2440	645	480	365	200	230	200
2	775	650	2490	2080	4670	2220	550	480	360	200	225	200
3	970	655	6230	2130	4740	2040	420	480	360	235	200	200
4	940	655	4640	2320	4460	1980	505	370	360	235	200	195
5	910	650	3560	2660	4270	1940	405	375	360	235	200	200
6	940	650	2760	3040	4240	2100	340	360	360	235	200	200
7	884	650	2340	3360	4370	1940	560	360	360	240	200	445
8	745	650	2140	3360	4370	1820	576	375	310	210	320	405
9	635	625	2000	3600	4060	1640	487	375	290	265	425	200
10	725	630	2840	4050	3760	1580	503	375	280	235	510	200
11	725	624	5870	4930	4370	1450	507	375	280	235	730	205
12	725	1240	4500	5430	5080	1380	596	375	295	245	725	355
13	725	913	3380	5430	5280	1270	545	360	280	240	725	355
14	720	660	2800	5570	6500	1230	445	360	280	245	710	400
15	720	660	2480	5790	6580	1180	455	380	275	210	720	480
16	720	660	3370	6150	5620	1090	455	380	280	210	720	205
17	720	660	3850	6650	6280	1020	310	360	245	210	720	205
18	720	844	3450	6570	4780	960	455	360	245	210	550	205
19	720	924	3750	6610	4020	940	475	360	280	210	200	325
20	700	974	3940	6270	3830	920	480	360	275	210	200	355
21	690	1040	3570	6120	3300	864	475	360	265	250	360	445
22	505	1140	3390	6650	3060	767	465	360	230	295	365	450
23	180	1590	3340	6910	3420	720	355	360	250	295	245	205
24	0	1570	2830	6650	3560	655	350	360	210	295	200	205
25	0	1500	2500	6380	3710	600	480	360	210	295	200	330
26	0	1480	2280	5720	4060	580	480	355	240	295	200	205
27	150	1480	2250	5720	3830	570	480	350	240	295	245	205
28	655	1430	2320	5290	3440	570	480	355	245	255	310	205
29	660	—	2260	4910	3060	570	490	365	230	200	200	205
30	620	—	2140	4460	2880	590	360	365	240	200	200	205
31	475	—	2060	—	2680	—	355	365	—	230	—	205
Mean	626	918	3119	4894	4278	1254	467	376	283	239	374	271
Runoff in Ac.Ft.	38480	50990	191800	291200	263000	74630	28730	23120	16860	14720	22280	16660
	Water Year Total 1062750								Calendar Year Total 1032470			

U. S. Geological Survey and Division of Water Resources cooperative station located above spillway of Narrows Dam. For total flow of Yuba River near Smartville combine with flows in Table 69. Drainage area is 1110 square miles. Period of record 1941 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 69

FLOW OF DEER CREEK NEAR SMARTVILLE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	138	34	57	140	27	10	2.2	2.1	1.5	1.8	2.6	9.1
2	130	34	995	139	25	9.4	1.8	2.0	1.5	1.6	2.4	9.1
3	61	39	2770	136	22	6.3	1.8	2.0	1.5	1.8	2.3	9.4
4	47	99	856	131	16	5.3	1.8	2.0	1.5	1.8	2.1	9.7
5	43	226	518	128	7.9	4.6	1.8	2.1	1.7	1.6	1.8	12
6	38	121	281	126	7.9	4.1	1.8	1.8	1.7	1.6	1.6	13
7	36	305	178	123	8.2	4.6	1.8	1.8	1.7	1.8	1.7	11
8	34	154	137	120	8.2	4.4	1.7	1.8	2.0	2.2	2.7	11
9	30	122	139	118	8.5	3.9	1.7	2.0	1.8	2.2	31	11
10	28	243	681	118	8.5	3.2	1.8	2.1	2.1	2.2	73	10
11	32	798	1190	120	8.2	4.1	1.7	2.1	3.0	1.8	36	10
12	32	223	578	142	7.6	6.0	1.6	2.0	1.5	1.8	23	10
13	30	121	279	186	7.3	5.1	1.8	2.2	1.2	1.8	17	10
14	27	89	204	214	9.4	3.5	1.8	2.1	1.2	1.8	16	12
15	30	66	174	238	10	3.0	2.0	2.2	1.3	1.8	14	21
16	28	68	307	227	11	3.3	2.1	2.2	1.4	2.1	16	19
17	27	87	206	229	11	9.4	1.8	2.2	1.5	2.2	11	58
18	27	98	186	233	12	8.2	1.8	2.0	1.5	2.1	11	88
19	33	95	253	240	17	9.4	1.8	1.8	1.4	2.4	10	65
20	35	132	255	206	25	9.7	2.1	1.8	1.3	2.4	10	36
21	44	122	202	84	18	8.8	2.0	1.6	1.4	2.3	10	28
22	82	201	256	76	15	9.4	2.0	1.5	1.6	2.7	9.7	21
23	60	197	320	72	14	8.8	1.8	1.4	2.4	2.7	9.7	16
24	41	151	251	167	12	10	2.0	1.5	1.4	2.6	9.4	14
25	38	110	208	158	9.7	9.4	2.2	1.5	1.3	2.6	9.1	9.7
26	37	87	186	72	12	9.1	2.2	1.5	1.4	2.3	9.1	9.4
27	35	78	171	65	14	8.8	2.1	1.5	1.3	2.1	9.1	8.8
28	35	64	164	58	9.4	6.5	2.0	1.6	1.6	2.0	9.4	8.5
29	34	—	151	50	10	2.6	2.1	2.1	1.6	2.0	10	8.5
30	34	—	147	34	14	2.3	2.0	2.2	1.8	2.2	8.8	8.5
31	34	—	147	—	12	—	2.0	1.8	—	2.6	—	8.5
Mean	43.9	149	402	138	12.8	6.44	1.91	1.89	1.60	2.09	12.6	18.6
Runoff in Ac.Ft.	2700	8260	24690	8230	789	383	117	116	95	129	753	1140
	Water Year Total 49695								Calendar Year Total 47402			

U. S. Geological Survey and Division of Water Resources cooperative station located 1 mile upstream from the mouth. Deer Creek is tributary to the Yuba River 1 mile below Narrows Dam. For total flow of Yuba River near Smartville combine with flows in Table 68. Drainage area is 83.5 square miles. Period of record 1935 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 70

FLOW OF YUBA RIVER AT MARYSVILLE (SIMPSON LANE BRIDGE) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	838	556	1700	2460	4180	2180	249	76	51	56	53	143
2	981	548	2060	2440	4270	1960	272	99	56	53	50	130
3	992	657	7800	2490	4500	1810	216	124	57	49	45	128
4	1020	714	7000	2570	4300	1670	152	120	64	50	46	124
5	998	854	6160	2840	4050	1610	167	82	61	49	46	120
6	957	969	4480	3180	3940	1660	131	74	64	49	44	115
7	969	1080	3380	3530	3990	1580	102	72	60	51	43	122
8	934	1150	2970	3710	4030	1490	130	66	65	51	44	371
9	854	998	2640	3830	3850	1360	164	67	65	50	50	255
10	746	912	3240	4260	3470	1260	158	65	66	53	299	158
11	760	1790	7000	5070	3750	1170	158	67	66	58	520	137
12	770	1840	6800	5900	4440	1110	160	65	57	56	603	137
13	770	1610	5500	6180	4890	1030	222	61	61	52	611	232
14	770	1250	4170	6290	5220	936	180	69	67	53	607	257
15	765	975	3420	6590	6320	845	135	65	67	49	619	426
16	760	864	3810	6740	5330	790	131	57	65	40	628	361
17	760	859	4400	7190	5660	736	135	57	64	36	628	199
18	760	885	4000	7280	4300	690	92	58	62	35	628	224
19	770	1000	4000	7220	3850	650	84	62	58	36	384	238
20	784	1130	4100	7080	3640	598	104	57	60	37	204	287
21	775	1330	4200	6660	3130	548	130	57	58	40	175	281
22	779	1380	3800	6830	2810	536	113	57	60	42	263	353
23	714	1960	4000	7180	2930	508	116	57	61	49	272	356
24	518	2090	3700	7190	3100	492	87	56	58	47	178	180
25	354	2020	3300	6840	3230	476	78	58	55	44	147	150
26	264	1880	3100	6220	3490	407	102	57	46	46	141	209
27	213	1880	2960	5750	3500	381	120	56	51	72	135	147
28	187	1800	2950	5350	3080	329	128	62	52	88	131	133
29	274	—	2890	5030	2790	293	130	53	61	88	147	130
30	510	—	2710	4520	2560	238	133	53	60	64	224	128
31	620	—	2600	—	2370	—	84	53	—	55	—	128
Mean	715	1249	4027	5281	3918	978	141	67.2	59.9	51.5	266	205
Runoff in Ac.Ft.	43970	69380	247600	314200	240900	58200	8650	4130	3570	3170	15800	12610
	Water Year Total 1072000								Calendar Year Total 1022180			

Station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. Station is at 7th Street Bridge at Mile 0.9L above mouth. Stage-discharge relationship is affected at times by variable backwater from the Feather River. Period of record 1939 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 71

FLOW OF BEAR RIVER NEAR WHEATLAND - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	316	116	410	795	288	156	3.1	2.0	3.6	31	10	32
2	380	116	1240	773	270	141	3.5	2.0	3.6	21	15	31
3	202	126	6750	768	273	86	3.9	2.0	3.9	15	15	29
4	155	144	4110	724	252	54	4.5	1.4	1.7	14	15	30
5	157	470	2300	751	232	45	7.6	1.6	0	8.3	13	33
6	285	301	1490	506	209	35	4.6	.1	.2	8.3	11	52
7	282	525	1130	228	206	27	2.8	.1	2.8	5.0	11	36
8	276	285	1030	658	209	29	1.9	.1	2.8	5.8	12	33
9	270	202	976	806	203	25	1.4	2.1	2.8	5.8	32	32
10	252	187	1440	817	206	29	2.8	.1	2.8	5.8	217	31
11	247	869	3460	822	200	25	4.6	.1	3.0	6.1	130	34
12	238	434	2860	898	158	25	4.0	.1	3.9	7.6	78	34
13	236	261	1770	934	104	22	3.1	.1	5.5	9.3	58	34
14	230	204	1260	898	108	13	.6	.1	6.9	8.6	48	49
15	225	175	1070	862	160	10	.5	.1	6.3	8.0	43	72
16	217	159	1220	886	129	6.3	.5	.1	6.9	7.3	39	80
17	207	171	1190	886	118	4.2	.5	.1	6.1	6.1	32	237
18	192	192	988	934	198	4.8	.3	.2	6.1	7.3	32	450
19	192	197	1050	795	222	4.8	.3	.7	6.3	9.0	36	425
20	192	209	1110	773	288	4.8	.5	2.5	5.0	12	36	334
21	162	341	934	707	277	4.2	2.7	4.8	5.8	12	35	188
22	363	685	946	641	248	4.0	.2	5.6	6.9	13	34	164
23	224	812	1230	512	206	3.0	.2	9.2	7.3	11	34	80
24	155	707	1020	303	186	4.0	.9	8.8	7.3	13	34	70
25	136	624	597	262	170	2.6	4.0	3.7	9.7	13	32	61
26	130	565	892	39	156	2.6	.2	1.9	10	9.3	29	66
27	122	550	1010	9.6	146	1.0	.2	1.9	11	12	34	62
28	105	489	1160	27	139	.6	.1	2.1	11	12	37	76
29	111	—	964	67	139	.3	.1	1.5	13	13	34	70
30	120	—	898	116	141	.6	1.9	1.4	32	12	32	67
31	120	—	850	—	116	—	2.1	1.5	—	10	—	62
Mean	210	361	1529	607	193	25.7	2.05	1.87	6.47	10.7	40.6	98.7
Runoff in Ac.Ft.	12890	20060	93990	36090	11880	1530	126	115	385	658	2420	6070
	Water Year Total 196966								Calendar Year Total 186214			

U. S. Geological Survey and Division of Water Resources cooperative station located on Highway 99-E bridge. The Bear River flows into the Feather River above Nicolaus at Mile 12.0L. Drainage area is 295 square miles. Period of record 1928 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 72

FLOW OF COON CREEK AT HIGHWAY 99-E - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	124	e26	58	77	20	15	3.5	5.2	4.4	9.8	4.4	6.1
2	149	25	74	88	19	14	3.5	4.4	9.8	9.8	4.4	6.1
3	67	25	e1100	88	24	8.7	4.4	3.5	9.8	7.8	2.6	6.1
4	52	34	e732	83	23	11	6.1	3.5	0	11	2.6	6.1
5	42	177	532	80	30	6.1	6.7	3.5	1.7	11	4.4	6.1
6	40	113	369	72	20	11	6.7	4.4	4.4	13	3.5	e7.8
7	36	274	226	67	20	5.2	6.1	5.2	4.4	14	4.4	8.7
8	32	130	168	61	18	6.1	6.7	6.1	4.4	13	5.2	7.8
9	29	103	143	59	23	12	6.7	6.7	4.4	12	18	6.7
10	25	92	290	54	20	4.4	5.2	6.7	4.4	14	70	6.1
11	24	147	990	58	17	4.4	5.2	7.8	4.4	18	53	5.2
12	24	217	638	53	14	4.4	2.6	6.1	4.4	20	33	6.1
13	24	96	279	41	13	4.4	2.6	6.7	4.4	20	26	6.1
14	25	67	193	34	14	4.4	2.6	6.1	3.5	19	17	6.1
15	25	53	164	28	30	2.6	3.5	6.1	3.5	11	15	15
16	23	44	206	28	28	2.6	4.4	6.1	2.6	8.7	14	19
17	21	44	162	26	28	3.5	3.5	6.1	3.5	8.7	13	24
18	21	40	130	18	24	4.4	3.5	6.1	4.4	11	12	54
19	21	38	195	20	41	6.7	4.4	6.1	6.1	11	11	67
20	49	36	256	21	54	9.8	2.6	5.2	5.2	15	9.8	30
21	44	34	147	21	44	11	3.5	4.4	2.6	12	9.8	19
22	116	33	151	19	37	6.7	6.7	6.1	.9	11	9.8	15
23	126	45	340	19	28	4.4	5.2	6.7	1.7	8.7	8.7	12
24	65	68	202	19	21	4.4	6.7	7.8	1.7	6.7	7.8	8.7
25	e54	61	142	18	18	4.4	7.8	8.7	3.5	5.2	6.7	7.8
26	44	54	118	14	13	3.5	6.1	6.7	6.1	4.4	5.2	6.7
27	40	65	111	14	8.7	3.5	4.4	5.2	6.7	3.5	3.5	5.2
28	43	52	136	18	6.7	4.4	4.4	9.8	8.7	2.6	4.4	5.2
29	47	—	99	23	9.8	4.4	4.4	11	11	5.2	5.2	5.2
30	34	—	87	23	13	5.2	3.5	9.8	9.8	6.7	6.1	5.2
31	28	—	83	—	14	—	5.2	5.2	—	5.2	—	5.2
Mean	48.2	78.3	275	41.4	22.4	6.4	4.8	6.2	4.7	10.6	13.0	12.8
Runoff in Ac.Ft.	2963	4350	16900	2467	1375	382	294	383	282	653	774	784
	Water Year Total 36302								Calendar Year Total 31607			

Division of Water Resources station located at the Highway 99-E bridge. Coon Creek is an east-side tributary to the Sacramento River, at Mile 19.6L, via "Cross Canal", the main drain between Reclamation Districts 1000 and 1001. Drainage area is 82.5 square miles. Period of record 1947 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 73

FLOW OF AUBURN RAVINE AT HIGHWAY 99-E - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	63	45	53	38	80	79	90	103	63	26	1.4	15
2	74	47	74	24	81	77	90	102	63	13	1.1	13
3	62	50	553	22	84	69	90	101	63	9.4	1.0	15
4	52	61	463	20	84	57	92	100	66	3.7	1.0	12
5	54	116	292	17	77	54	92	102	67	2.7	1.0	11
6	66	75	220	16	61	58	90	103	67	2.7	1.0	12
7	70	131	169	16	60	76	90	105	67	17	1.0	14
8	73	83	132	13	55	77	90	103	68	31	1.6	14
9	70	67	128	14	57	105	89	105	68	26	29	15
10	70	61	211	12	64	94	89	105	63	26	71	19
11	74	99	432	12	78	85	89	108	47	25	33	18
12	68	70	346	14	81	90	86	108	46	23	18	18
13	54	60	210	e12	79	90	84	108	44	23	17	17
14	45	55	166	9.7	92	99	84	109	41	20	18	18
15	45	58	148	8.6	95	103	84	104	35	7.5	24	28
16	44	54	177	8.6	96	99	87	90	33	5.7	20	21
17	41	52	133	8.6	70	101	87	87	33	5.2	15	52
18	45	53	112	7.1	65	101	85	89	34	3.4	15	40
19	44	53	158	6.0	74	104	86	86	34	2.5	15	47
20	74	52	166	6.3	74	103	86	82	34	2.0	10	26
21	54	52	126	7.1	64	97	67	80	34	2.0	11	22
22	86	52	e174	9.7	59	86	41	81	34	2.0	14	20
23	102	56	225	50	52	86	99	79	32	1.8	15	21
24	62	70	165	60	34	89	102	82	33	1.1	10	18
25	57	55	138	67	31	91	104	81	35	3.1	8.2	13
26	60	60	99	70	29	91	102	77	36	2.2	7.5	9.4
27	54	58	66	66	43	92	102	74	35	2.0	6.3	11
28	53	52	77	63	51	91	102	80	37	1.8	6.0	13
29	52	—	58	66	61	91	103	78	39	1.8	9.4	14
30	52	—	51	79	64	90	108	70	38	1.4	12	11
31	47	—	44	—	67	—	106	62	—	1.1	—	13
Mean	60.2	64.2	180	27.4	66.5	87.5	90.2	91.7	46.3	9.58	13.1	19.0
Runoff in Ac.Ft.	3703	3564	11040	1632	4090	5207	5546	5641	2755	589	780	1171
	Water Year Total 47381								Calendar Year Total 45718			

Division of Water Resources station located at the Highway 99-E bridge. Auburn Ravine is an east-side tributary to the Sacramento River at Mile 19.6L via "Cross Canal", the main drain between Reclamation Districts 1000 and 1001. Drainage area is 34.6 square miles. Period of record 1947 to date.
e Estimated.

TABLE 74

FLOW OF RECLAMATION DISTRICT 1001 DRAIN INTO CROSS CANAL* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	30	0	0	0	0							
2	0	0	0	0	36							
3	0	0	24	29	0							
4	21	0	18	0	0							
5	0	0	40	0	43							
6	0	39	48	0	0							
7	0	0	31	40	39							
8	0	0	25	0	0							
9	0	0	22	0	0							
10	0	0	50	0	0							
11	0	26	158	0	0							
12	0	0	147	31	0	N	N	N	N	N	N	N
13	0	0	91	0	0	0	0	0	0	0	0	0
14	0	0	44	0	34							
15	0	0	28	0	0							
16	0	0	16	0	0							
17	0	0	24	0	0	F	F	F	F	F	F	F
18	0	0	15	0	0	L	L	L	L	L	L	L
19	0	0	16	0	0	0	0	0	0	0	0	0
20	0	0	60	0	0	W	W	W	W	W	W	W
21	0	29	73	0	39							
22	48	0	29	0	0							
23	0	0	28	0	26							
24	0	0	21	0	83							
25	0	0	17	0	0							
26	0	12	12	0	74							
27	0	0	14	42	0							
28	0	0	0	0	0							
29	0	—	24	0	0							
30	0	—	0	32	0							
31	0	—	22	—	0	—			—		—	
Mean	3.2	3.8	35.4	5.8	12.1	0	0	0	0	0	0	0
Runoff in Ac.Ft.	196	210	2176	345	742	0	0	0	0	0	0	0
	Water Year Total 3992								Calendar Year Total 3669			

This is drainage return to the Sacramento River via the cross canal by pumping and gravity. Period of record 1940 to date. Records for 1949 computed by Division of Water Resources.
* Cross Canal, the main drain between Reclamation Districts 1000 and 1001, joins the Sacramento River at Mile 19.6L.

TABLE 75

FLOW OF RECLAMATION DISTRICT 1000 DRAIN (#3 PLANT) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1 2 3 4 5												
6 7 8 9 10												
11 12 13 14 15	Records sufficient to compute only monthly flows.											
16 17 18 19 20												
21 22 23 24 25												
26 27 28 29 30 31		— — —		—		—			—		—	
Mean	45.2	39.6	50.4	21.6	68.3	21.4	16.9	56.8	43.7	47.9	27.5	31.0
Runoff in Ac.Ft.	2780	2200	3096	1290	4200	1272	1037	3495	2598	2945	1638	1908
		Water Year Total 24130							Calendar Year Total 28459			

This is drainage from Reclamation District 1000 returned to Sacramento River by pumping and gravity at Mile 6.85L. Daily distribution of flows are not available since the plant operates automatically on float switch. Additional water returned to Sacramento River from same district at Mile 2.1L, (See Table 77). Water returned to the Sacramento River from the Pritchard Lake Plant at Mile 16.0L was negligible during 1949. Period of record 1940 to date. Records for 1949 computed by Division of Water Resources.

TABLE 76

FLOW OVER SACRAMENTO WEIR FROM SACRAMENTO RIVER TO YOLO BY-PASS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1 2 3 4 5												
6 7 8 9 10												
11 12 13 14 15	NO FLOW OVER WEIR DURING 1949											
16 17 18 19 20												
21 22 23 24 25												
26 27 28 29 30 31		— — —		—		—			—		—	
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	0	0	0	0	0	0	0	0	0	0
		Water Year Total 0							Calendar Year Total 0			

Elevation--fixed crest 25.0 U.S.E.D.--Movable crest (top of needles) 31.0 U.S.E.D. Weir has 48 gates, each 38 feet in length. Weir is on right bank at Mile 4.2R above Sacramento. Period of record 1940 to date.

TABLE 77

FLOW OF RECLAMATION DISTRICT 1000 DRAIN (2ND BANNON SLOUGH) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			0	0	0	0		0	52	57		
2			0	0	0	0		0	52	0		
3			60	0	0	0		0	74	0		
4			182	0	0	65		0	52	0		
5			107	0	0	0		0	38	0		
6			110	0	48	0		0	38	0		
7			0	0	0	0		0	45	0		
8			0	0	0	0		0	64	0		
9			72	0	0	0		0	91	0		
10			82	0	0	0		0	129	0		
11			223	0	0	0		0	110	0		
12	N	N	329	0	0	0	N	0	75	0	N	N
13	0	0	245	0	0	0	0	0	125	0	0	0
14			141	0	0	0		0	133	0		
15			62	0	55	0		0	170	0		
16			98	0	60	0		0	163	0		
17	F	F	74	0	0	0	F	42	162	0	F	F
18	L	L	0	29	124	0	L	0	162	0	L	L
19	0	0	124	0	62	0	0	0	108	0	0	0
20	W	W	181	0	76	0	W	49	155	0	W	W
21			104	0	141	0		0	161	0		
22			108	0	63	0		74	159	0		
23			111	0	114	0		0	139	0		
24			60	0	0	0		0	120	0		
25			70	0	88	0		65	108	0		
26			77	0	0	0		0	110	0		
27			0	0	0	0		58	106	0		
28			67	0	0	0		0	56	0		
29		—	0	0	0	0		88	56	0		
30		—	0	0	0	0		15	0	0		
31		—	0	—	0	—		66	—	0	—	
Mean	0	0	86.7	1.0	26.8	2.2	0	14.7	100	1.8	0	0
Runoff in Ac.Ft.	0	0	5330	58	1648	129	0	906	5976	113	0	0
	Water Year Total 17893								Calendar Year Total 14160			

This is drainage from Reclamation District 1000 returned to the Sacramento River by pumping at Mile 2.1L. Additional water returned to Sacramento River at Mile 6.85L (See Table 75). Water returned to the Sacramento River from the Pritchard Lake Plant at Mile 16.0L was negligible during 1949. Period of record 1925 to date. Records for 1949 computed by Division of Water Resources.

TABLE 78

FLOW OF LINDA CREEK NEAR ROSEVILLE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1								11	13	20	12	28
2								10	13	20	13	26
3								11	12	20	14	24
4								9.1	12	20	14	24
5								8.6	14	20	14	25
6								8.0	16	22	14	25
7								9.1	15	24	16	25
8								9.6	18	23	18	28
9								9.3	20	24	39	27
10								9.6	17	24	78	25
11								11	22	32	60	23
12								14	23	38	41	22
13								13	24	25	32	22
14								13	25	20	28	22
15								16	23	18	27	40
16								16	23	15	30	57
17								15	23	15	30	65
18								16	23	16	27	78
19								16	20	18	29	73
20								16	19	19	28	48
21								15	18	18	28	36
22							*8.0	17	19	26	27	33
23							8.3	16	18	16	26	37
24							8.8	15	17	14	25	41
25							9.1	16	20	14	25	30
26							10	15	26	13	25	29
27							10	13	24	13	26	28
28							10	17	26	14	26	33
29		—					11	18	26	13	29	38
30		—					11	17	24	13	29	40
31		—		—		—	11	16	—	12	—	44
Mean								13.4	19.8	19.3	27.7	35.4
Runoff in Ac.Ft.								826	1176	1188	1646	2174
	Water Year Total								Calendar Year Total			

Division of Water Resources station located at Antelope Road bridge 0.5 mile downstream from Highway 99-E. Linda Creek is an east-side tributary to the Sacramento River at Mile 1.3L via the Back Borrow Pit of Reclamation District 1000. Recorder installed July 22, 1949. Period of record 1949.

* Beginning of record.

TABLE 79

FLOW OF AMERICAN RIVER AT FAIR OAKS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1110	895	2370	2900	8900	4510	776	222	208	198	278	685
2	2040	975	3470	2820	9800	4180	732	222	222	198	396	622
3	1680	975	25500	3000	9050	4080	660	233	180	194	299	580
4	1280	995	14100	3060	8850	3940	620	216	150	184	328	492
5	1060	1600	7340	3700	8580	4280	596	199	155	177	340	580
6	1020	1510	5260	4460	8450	4400	572	186	158	168	294	601
7	1180	2150	4270	5130	8720	4460	520	193	150	171	312	615
8	1170	2000	3820	5330	8650	4260	470	199	158	174	371	566
9	1060	1610	3370	5520	7630	4080	457	186	152	184	594	552
10	1000	1480	3730	6340	6960	3780	436	186	145	218	1400	545
11	809	2970	6160	7670	8320	3550	381	193	142	215	1710	517
12	827	3040	7610	8650	10400	3210	359	183	155	215	880	552
13	995	1920	6280	8780	11600	2800	323	186	174	229	692	517
14	1090	1560	4940	9020	11400	2620	305	180	142	243	643	545
15	985	1460	4300	9560	11500	2590	296	183	166	254	699	643
16	915	1390	7130	10200	10200	2470	292	180	166	250	580	664
17	855	1360	7410	11200	10600	2170	318	180	158	204	517	776
18	885	1420	5810	10800	8500	1940	267	177	155	212	573	760
19	965	1580	5840	10500	7120	1810	248	171	160	243	531	1220
20	1150	1700	5820	10100	6940	1590	219	166	166	323	474	1080
21	1080	1830	5100	10600	6200	1450	222	155	183	340	510	736
22	1290	1800	5120	12500	5980	1370	270	166	177	326	643	643
23	1370	2240	6440	13500	6420	1280	236	166	169	278	615	685
24	1120	2520	5770	14000	7120	1220	255	163	166	320	538	622
25	1020	2540	4850	13400	7670	1140	240	169	147	299	492	517
26	955	2460	4000	11500	8010	1020	274	155	160	402	538	438
27	1020	2610	3550	11500	7700	1040	244	155	183	333	587	462
28	955	2460	3920	10700	6940	956	226	163	147	262	538	566
29	945	—	3640	10100	6000	920	230	152	180	274	671	594
30	915	—	3330	9080	5550	857	244	208	186	286	699	524
31	855	—	3180	—	5150	—	212	208	—	282	—	587
Mean	1094	1823	5917	8521	8416	2599	371	184	165	247	591	629
Runoff in Ac.Ft.	66650	101300	363800	507000	517500	154700	22810	11310	9840	15200	35200	38600
	Water Year Total 1906140								Calendar Year Total 1843910			

U. S. Geological Survey station located on right bank at Mile 19.2 above mouth. Drainage area is 1921 square miles. Period of record 1904 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 80

FLOW OF AMERICAN RIVER AT SACRAMENTO (H ST. BRIDGE) 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1000	900	2240	2740	9060	4510	720	226	215	204	302	638
2	1780	920	2540	2660	9960	4030	701	232	249	204	392	620
3	1630	940	19100	2800	9520	3930	656	238	232	210	346	569
4	1250	960	16800	2860	9170	3800	603	249	162	194	314	496
5	1010	1360	8580	3380	9040	4110	569	215	157	188	352	527
6	960	1490	5990	4190	8880	4190	552	199	162	178	359	603
7	1070	1840	4450	4960	8970	4350	527	194	168	178	302	603
8	1120	1920	3700	5360	8990	4070	480	210	162	178	421	578
9	1040	1530	3240	5400	8180	3900	473	204	173	173	457	552
10	970	1350	3380	6280	7270	3530	450	188	162	210	978	552
11	850	2350	6040	7590	8230	3310	399	194	152	238	1840	535
12	810	3080	8510	8780	10500	3130	366	188	152	226	1000	569
13	910	1910	7180	8880	11600	2690	372	183	157	238	692	535
14	1010	1450	5030	9060	13000	2400	326	173	168	260	629	527
15	970	1360	4330	9560	14800	2410	320	178	152	266	683	620
16	920	1300	6620	10100	10600	2350	302	173	162	296	620	656
17	850	1250	8680	11100	10800	2030	333	178	157	249	512	720
18	860	1290	6400	11000	9220	1820	302	173	152	232	527	758
19	940	1450	6170	10700	7610	1680	260	168	152	260	569	1050
20	1050	1570	6620	10300	7270	1460	249	162	152	320	473	1140
21	1010	1690	5430	10600	6480	1300	215	157	157	372	457	796
22	1170	1680	5180	12100	6060	1200	254	152	178	372	535	647
23	1320	1970	7050	13100	6570	1120	260	157	168	302	647	656
24	1070	2360	5370	13600	7310	1050	254	157	162	326	535	683
25	1000	2400	5240	13100	7860	947	249	162	157	340	512	560
26	930	2320	4430	11600	8320	855	284	157	157	378	480	457
27	960	2400	3690	11300	8050	885	272	152	168	421	535	473
28	930	2350	3780	10900	7310	796	249	157	183	320	519	504
29	910	—	3570	10300	6240	776	249	168	188	278	612	578
30	890	—	3190	9520	5650	758	249	199	199	314	683	552
31	850	—	3100	—	5170	—	260	226	—	314	—	586
Mean	1034	1692	5988	8464	8635	2416	379	186	170	266	576	624
Runoff in Ac.Ft.	63550	94000	368200	503600	531000	145600	23320	11440	10150	16340	34280	38360
	Water Year Total 1896430								Calendar Year Total 1839840			

Station is maintained jointly by Division of Water Resources and the U. S. Geological Survey. Station is located at the "H" Street Bridge and is 6.0 miles above mouth of river. The American River flows into the Sacramento River at Mile 1.1L. Period of record 1921, 1926 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 81

FLOW OF CACHE CREEK NEAR CAPAY - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	123	61	247	321	368	431	423	387	288	51	7.4	9.3
2	238	61	311	297	361	398	384	380	288	51	6.1	9.3
3	251	63	1240	280	361	367	363	394	285	52	5.5	10
4	176	65	1400	263	380	360	340	405	291	61	4.9	11
5	141	76	1100	247	422	370	330	409	294	61	4.4	13
6	125	112	1150	238	422	387	350	394	294	54	3.9	14
7	119	484	785	228	426	419	380	353	307	46	4.9	15
8	156	304	582	222	422	416	394	343	310	34	6.1	17
9	148	198	521	219	391	409	394	360	288	30	11	19
10	100	164	3490	216	380	419	387	363	257	25	17	20
11	70	675	6350	216	373	435	380	353	230	22	19	20
12	75	613	4650	213	384	466	370	353	224	20	18	20
13	90	324	2490	210	367	486	384	356	224	18	15	20
14	95	228	1700	207	343	498	394	350	207	20	13	20
15	84	182	1350	196	330	490	394	356	198	20	11	24
16	76	157	1480	179	327	482	394	360	207	20	10	26
17	70	150	1860	162	317	478	391	360	187	20	17	27
18	69	150	1560	150	323	454	387	343	168	20	35	29
19	74	154	1720	140	330	427	387	336	148	22	22	31
20	78	157	1870	130	301	401	387	333	123	24	16	38
21	76	190	1340	125	298	398	405	333	110	20	14	39
22	78	244	1100	120	294	398	412	333	101	20	12	36
23	80	682	934	130	301	427	394	343	84	22	11	32
24	78	557	792	179	330	439	391	346	80	22	11	30
25	69	438	668	199	350	439	405	343	65	20	10	29
26	63	361	557	263	412	439	412	333	58	20	10	28
27	61	321	495	328	442	416	405	327	52	18	10	27
28	59	276	458	353	442	409	394	323	52	15	10	26
29	58	—	418	380	462	435	391	320	49	11	10	25
30	59	—	380	383	462	442	380	314	49	9.3	9.3	24
31	59	—	342	—	458	—	373	294	—	8.0	—	24
Mean	99.9	266	1398	226	374	428	386	352	184	27.6	11.8	23.0
Runoff in Ac.Ft.	6140	14770	85960	13480	22970	25460	23750	21610	10940	1700	703	1410
	Water Year Total 231708								Calendar Year Total 228893			

U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station located 3 miles northwest of Capay and 2 miles upstream from Clear Lake Water Company diversion dam. Cache Creek is a west-side tributary to Yolo By-Pass opposite Mile 7.0 north of Sacramento By-Pass. Drainage area is 1052 square miles. Period of record 1944 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 82

FLOW OF CACHE CREEK AT YOLO - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		0	180	310								
2		0	160	284								
3		0	583	248								
4		0	1020	230								
5		0	964	209								
6		0	886	192								
7		0	748	184								
8		260	535	161								
9		160	427	154								
10		110	1710	140								
11		100	4590	120								
12	N	620	5740	100	N	N	N	N	N	N	N	N
13	O	332	2540	85	O	O	O	O	O	O	O	O
14		211	1650	75								
15		160	1320	50								
16		130	1320	20								
17	F	110	1700	7	F	F	F	F	F	F	F	F
18	L	100	1500	1	L	L	L	L	L	L	L	L
19	O	90	1490	0	O	O	O	O	O	O	O	O
20	W	90	1830	0	W	W	W	W	W	W	W	W
21		90	1370	0								
22		110	1090	0								
23		220	945	0								
24		476	802	0								
25		360	712	0								
26		296	598	0								
27		241	520	0								
28		214	470	0								
29		—	432	0								
30		—	390	0								
31		—	345	—		—			—		—	
Mean	0	160	1244	85.7	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	9890	76500	5100	0	0	0	0	0	0	0	0
	Water Year Total 90490								Calendar Year Total 90490			

U. S. Geological Survey and Division of Water Resources cooperative station located 0.5 mile south of Yolo. Cache Creek is a west-side tributary to Yolo By-Pass opposite Mile 7.0 north of Sacramento By-Pass. Drainage area is 1150 square miles. Period of record 1903 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 83

FLOW OF PUTAH CREEK NEAR WINTERS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	193	128	365	396	105	24	3.8	3.0	4.1	2.7	5.0	8.0
2	536	127	506	375	101	23	4.0	3.0	3.8	2.4	5.0	8.0
3	380	129	2180	345	100	22	4.4	3.0	3.4	2.1	5.0	8.0
4	247	156	2010	320	99	20	4.6	3.0	3.6	2.1	5.0	9.0
5	190	622	1440	300	94	18	5.6	3.0	3.8	2.2	5.0	10
6	161	502	1400	288	85	16	5.2	3.0	4.0	2.0	5.0	11
7	145	2880	1040	276	80	16	4.0	3.0	4.0	1.6	6.0	12
8	180	1160	814	260	75	14	4.0	3.0	3.6	1.4	7.0	13
9	180	674	750	250	76	13	4.0	3.0	3.6	1.9	9.0	15
10	146	492	4600	238	82	11	4.0	3.0	3.8	2.1	15	14
11	128	1910	11300	226	79	10	4.0	3.0	3.2	2.1	10	12
12	127	1240	7720	217	72	9.1	4.0	3.0	2.4	2.0	8.0	10
13	114	734	2770	208	66	7.7	4.0	3.0	2.0	1.9	7.0	8.0
14	105	512	1840	199	64	6.9	4.0	3.0	2.2	1.7	6.0	7.0
15	96	414	1410	187	63	6.1	4.0	3.0	2.8	1.7	6.0	7.0
16	94	351	1720	182	62	6.1	4.0	3.0	3.1	1.6	6.0	6.6
17	87	322	2780	180	62	6.4	4.0	3.0	3.5	1.3	6.0	10
18	83	300	1860	175	59	6.1	4.0	5.9	3.6	1.2	6.0	40
19	93	286	2470	165	64	6.1	4.0	5.0	3.8	1.2	6.0	100
20	112	274	2280	153	66	6.4	4.0	3.8	4.0	1.3	6.0	80
21	114	416	1530	147	64	5.9	4.0	3.1	3.8	2.0	6.0	60
22	160	450	1280	143	63	5.4	4.0	2.5	3.3	3.0	6.0	50
23	235	1210	1240	139	62	4.8	4.0	2.2	3.3	4.0	6.0	40
24	193	834	1040	133	54	4.4	4.0	2.0	3.0	4.0	6.0	35
25	162	782	879	126	46	4.0	4.0	1.6	3.0	4.0	6.0	30
26	144	578	750	123	39	4.4	4.0	1.6	2.9	4.0	6.0	30
27	132	492	660	118	35	4.2	4.0	3.1	3.0	4.5	7.0	25
28	127	419	578	113	31	5.2	4.0	4.6	3.1	5.0	7.0	24
29	122	—	512	112	27	6.6	4.0	4.6	3.0	5.0	7.0	26
30	127	—	470	111	24	5.6	4.0	4.0	3.1	6.0	7.0	25
31	128	—	428	—	23	—	4.0	4.1	—	5.0	—	25
Mean	163	657	1956	207	65.2	9.95	4.12	3.20	3.33	2.68	6.60	24.5
Runoff in Ac.Ft.	10000	36480	120200	12310	4010	592	253	197	198	165	393	1500
	Water Year Total 191364								Calendar Year Total 186298			

U. S. Geological Survey and Division of Water Resources cooperative station located 6 miles west of Winters. Putah Creek is a west-side tributary to Yolo By-Pass below Sacramento By-Pass. Drainage area is 614 square miles. Period of record 1930 to date. (Records 6 miles downstream available 1905 to 1931.) Records for 1949 computed by U. S. Geological Survey.

TABLE 84

FLOW OF PUTAH CREEK NEAR DAVIS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	174	103	384	401	97	9.6						
2	270	97	375	379	94	3.7						
3	490	94	1780	353	91	2.9						
4	298	106	1950	332	88	2.2						
5	211	346	1540	307	83	2.0						
6	163	634	1380	290	77	1.2						
7	137	2370	1080	274	69	.1						
8	140	1470	796	262	67	0						
9	163	705	658	246	64	0						
10	160	490	3550	238	62	0						
11	129	895	9180	227	67	0						
12	118	1540	12600	215	58	0	N	N	N	N	N	N
13	108	796	3500	204	51	0	0	0	0	0	0	0
14	94	535	2090	193	46	0						
15	86	414	1620	178	42	0						
16	82	353	1580	170	41	0						
17	67	315	2540	170	33	0	F	F	F	F	F	F
18	60	294	1980	163	38	0	L	L	L	L	L	L
19	71	278	2010	156	38	0	0	0	0	0	0	0
20	91	258	2570	146	44	0	W	W	W	W	W	W
21	100	286	1620	140	39	0						
22	115	428	1330	137	39	0						
23	234	912	1260	130	36	0						
24	204	936	1130	127	34	0						
25	160	782	950	121	31	0						
26	137	610	803	115	25	0						
27	124	500	677	112	16	0						
28	115	432	586	109	13	0						
29	115	—	525	109	9.6	0						
30	118	—	475	103	7.0	0						
31	112	—	432	—	5.2	—			—		—	
Mean	150	606	2031	204	48.5	0.72	0	0	0	0	0	0
Runoff in Ac.Ft.	9220	33680	124900	12110	2980	43	0	0	0	0	0	0
	Water Year Total 185893								Calendar Year Total 182933			

U. S. Geological Survey, U. S. Bureau of Reclamation and Division of Water Resources cooperative station located about 1 mile upstream from Highway 40. Putah Creek is a west-side tributary to Yolo By-Pass below Sacramento By-Pass. Period of record 1948 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 85

FLOW OF YOLO BY-PASS NEAR WOODLAND* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	23	11	158	524	46	25	43	36	59	38	6.8	4.8
2	23	10	156	400	47	24	44	38	58	34	6.2	5.0
3	23	10	156	348	47	36	43	38	58	31	5.7	5.5
4	20	9.4	162	291	76	43	45	38	66	29	5.2	5.8
5	19	10	190	256	64	45	46	38	69	27	4.9	6.2
6	18	8.9	620	232	58	43	49	37	72	25	4.4	6.2
7	19	11	1470	210	57	40	49	35	75	24	4.2	7.0
8	21	11	1870	195	52	35	50	35	76	23	4.2	7.3
9	23	12	1670	185	45	33	51	37	81	20	5.0	7.3
10	26	11	1340	180	39	29	49	36	83	19	5.4	8.1
11	69	13	3070	171	36	26	46	36	78	18	4.8	7.9
12	67	13	6120	144	38	23	43	36	76	17	4.3	7.7
13	50	12	6430	93	41	23	39	37	71	16	4.2	7.9
14	42	12	13300	64	42	24	35	39	69	14	4.2	8.1
15	38	11	16000	52	37	26	28	38	68	13	4.2	8.8
16	35	12	8670	49	32	26	27	38	70	13	4.8	9.0
17	30	15	6160	44	32	27	31	37	67	13	5.0	9.6
18	29	42	5680	37	31	26	30	39	62	13	5.4	12
19	32	76	5470	32	30	26	31	43	63	11	5.5	13
20	37	97	5350	24	27	26	30	43	60	9.8	5.7	12
21	38	108	5260	20	25	26	30	43	59	9.4	5.4	10
22	42	124	5160	17	20	26	30	49	60	9.2	5.0	9.2
23	44	144	4880	20	23	28	32	44	80	12	4.9	8.8
24	45	150	4400	25	38	28	34	43	113	11	4.9	9.8
25	45	151	3880	29	42	27	35	43	101	9.4	4.8	9.4
26	44	154	3330	29	41	25	36	42	83	8.6	4.4	9.2
27	45	157	2740	32	47	28	38	43	66	8.1	4.6	9.0
28	42	159	2050	37	47	31	37	45	55	7.9	4.6	8.8
29	26	—	1250	42	48	34	36	47	48	8.8	4.2	10
30	19	—	875	44	41	39	36	52	43	9.4	4.6	13
31	14	—	704	—	34	—	34	54	—	7.9	—	12
Mean	33.8	55.5	3841	128	41.4	29.9	38.3	40.8	69.8	16.5	4.92	8.66
Runoff in Ac.Ft.	2080	3080	236200	7590	2540	1780	2350	2510	4150	1010	293	532
	Water Year Total 264261								Calendar Year Total 264115			

Station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. The flow of this station is referred to the recorder at the end of the Sacramento By-Pass except during periods of high water when it is referred to the recorder at the Woodland-Elkhorn highway crossing. To get total flow through Yolo By-Pass below Sacramento, combine this flow with the flow in Tables 76 and 84. The flow in this table includes the flows of Cache Creek (Table 82), Knights Landing Ridge Cut (Table 53), and Fremont Weir (Table 56). Period of record 1930 to date. Records for 1949 computed by U. S. Geological Survey.

* Also known as Yolo By-Pass at Elkhorn.

TABLE 86

FLOW OF COSUMNES RIVER AT MICHIGAN BAR - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	225	109	355	555	910	390	58	9.2	9.2	4.5	12	35
2	330	105	1250	548	920	355	54	9.2	8.4	5.7	13	35
3	212	116	9010	583	880	334	51	9.6	7.2	7.6	12	36
4	118	145	3310	590	840	312	50	8.4	6.8	8.4	13	35
5	90	360	1510	642	804	301	46	7.6	6.0	7.2	13	33
6	103	290	1020	733	759	294	45	7.2	5.1	6.8	12	33
7	113	407	759	768	750	286	42	6.8	4.8	6.8	11	35
8	105	323	690	777	733	276	39	6.0	3.9	6.8	12	38
9	94	238	590	813	699	262	39	6.0	3.9	6.8	22	39
10	73	219	674	900	642	245	36	6.0	3.9	7.2	190	40
11	54	671	1310	1050	650	228	34	5.7	3.4	8.4	254	38
12	62	496	2230	1160	699	212	31	5.4	3.4	10	120	34
13	68	304	1420	1180	759	197	30	6.0	3.9	10	75	31
14	76	248	995	1190	900	182	28	6.6	3.9	11	62	28
15	72	219	804	1260	973	168	25	6.0	3.6	12	54	40
16	68	203	1390	1310	822	153	23	5.4	4.2	11	48	41
17	64	209	1190	1370	777	138	22	6.0	4.5	9.6	43	47
18	66	238	962	1330	716	128	20	5.7	4.5	9.6	42	70
19	85	255	1260	1290	674	126	19	5.7	3.6	9.6	40	105
20	153	269	1400	1240	690	122	18	4.8	4.2	9.6	38	120
21	150	262	1070	1250	620	105	17	5.4	4.2	13	39	75
22	331	258	1160	1340	569	101	15	5.4	3.2	13	38	54
23	315	400	1660	1420	548	94	15	4.8	3.4	14	38	54
24	219	380	1260	1440	548	88	15	4.8	3.4	12	36	52
25	148	380	973	1400	555	83	13	4.8	3.4	13	34	51
26	133	420	813	1270	555	78	12	4.5	3.6	14	35	47
27	131	527	733	1200	548	73	12	4.8	3.2	14	38	43
28	120	413	750	1130	507	68	11	5.4	4.2	14	36	42
29	113	—	699	1080	468	64	11	5.4	3.9	13	38	43
30	116	—	642	995	437	61	11	6.4	4.5	12	38	42
31	111	—	620	—	443	—	9.6	7.2	—	11	—	41
Mean	133	302	1371	1060	690	184	27.5	6.18	4.51	10.1	48.5	47.0
Runoff in Ac.Ft.	8170	16790	84320	63100	42440	10960	1690	380	269	618	2890	2890
	Water Year Total 237443								Calendar Year Total 234517			

U. S. Geological Survey and Division of Water Resources cooperative station located at the highway bridge at Michigan Bar. Drainage area is 537 square miles. Period of record 1907 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 87

FLOW OF COSUMNES RIVER AT McCONNELL - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	158	108	421	623	940	419	29				0	27
2	276	108	406	591	890	366	30				0	26
3	304	104	4990	605	885	341	32				0	25
4	186	112	12700	627	849	317	32				0	26
5	118	182	4340	661	804	298	29				0	26
6	99	469	2060	726	764	287	22				0	25
7	107	425	1290	808	738	271	18				0	26
8	112	638	1010	822	734	258	14				0	26
9	102	356	822	817	722	243	12				0	26
10	90	261	853	889	666	227	14				1.7	27
11	71	313	2530	1010	636	214	17				263	29
12	54	940	3160	1150	666	197	10	N	N	N	180	28
13	61	455	2500	1200	726	182	13	0	0	0	100	26
14	69	291	1460	1220	800	170	2.4				67	25
15	68	236	1100	1290	1020	154	1.9				52	26
16	61	212	1320	1320	885	142	4.2				44	30
17	60	192	2040	1380	795	125	2.1	F	F	F	40	33
18	55	194	1300	1340	742	102	.3	L	L	L	37	40
19	68	214	1220	1290	678	89	0	0	0	0	35	60
20	100	223	2750	1260	674	84	0	W	W	W	32	98
21	154	234	1650	1240	636	89	0				31	92
22	226	225	1260	1300	574	67	0				30	63
23	629	259	2030	1380	546	66	0				29	47
24	458	381	1750	1440	529	63	0				28	46
25	268	359	1280	1430	523	64	0				28	44
26	182	359	1010	1320	529	59	0				27	43
27	154	674	862	1230	526	50	0				27	40
28	141	598	804	1170	506	44	0				28	37
29	128	—	794	1120	470	41	0				26	36
30	121	—	710	1040	412	37	0				27	36
31	116	—	637	—	424	—	0		—		—	35
Mean	155	326	1971	1077	688	169	9.13	0	0	0	37.8	37.9
Runoff in Ac.Ft.	9510	18090	121200	64060	42290	10050	561	0	0	0	2250	2330
	Water Year Total 273251								Calendar Year Total 270341			

U. S. Geological Survey, U. S. Bureau of Reclamation and Division of Water Resources cooperative station located on Highway 99 bridge. When flow in main channel reaches 4600 c.f.s. water starts to by-pass station. Figures here given include all overflow. Drainage area is 730 square miles. Period of record 1942 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 88

FLOW OF DRY CREEK NEAR IONE (OLD FORNI RANCH) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15	29	134	114	e10							
2	65	25	190	106	e7.5							
3	50	29	1410	101	e5.6							
4	26	42	e2350	96	e3.8							
5	14	242	e1660	90	e2.7							
6	9.9	188	e1090	84	e1.6							
7	10	290	e629	80	e0.9							
8	8.3	220	e322	76	e.4							
9	7.2	143	259	74	e.3							
10	e5.3	102	257	72	e.8							
11	e6.2	168	331	68	e1.7							
12	e6.9	248	584	65	e3.2							
13	e7.5	157	484	59	e4.9							
14	11	110	343	56	e7.2							
15	9.1	87	284	52	e10		Station discontinued June 1, 1949.					
16	5.3	75	338	48	e12							
17	5.6	68	303	48	e12							
18	5.3	74	252	45	e12							
19	6.5	80	246	42	e12							
20	65	78	536	38	e12							
21	66	75	313	37	e12							
22	202	71	271	34	e11							
23	231	98	400	32	e11							
24	137	114	343	29	e9.5							
25	84	134	282	26	e7.5							
26	64	137	233	24	e5.9							
27	51	271	197	22	e4.6							
28	42	175	167	e20	e3.6							
29	37	—	146	e16	e2.7							
30	36	—	132	e13	e2.0							
31	36	—	124	—	e1.5	—			—		—	
Mean	42.7	126	471	55.6	6.2							
Runoff in Ac.Ft.	2628	7002	28980	3306	381							
	Water Year Total								Calendar Year Total			

Division of Water Resources station located at old site of U. S. Geological Survey station of the same name approximately 2.5 miles downstream from the junction of Jackson Creek. Due to unratable conditions at high flows, this station will be replaced in 1950 by the stations "Dry Creek above Jackson Creek" and "Jackson Creek at Highway 88". Drainage area is 279 square miles. Period of record 1911 to 1912; 1925 to 1932; 1948 and 1949.
e Estimated.

TABLE 89

FLOW OF DRY CREEK NEAR GALT* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	21	104	151	3.0							
2	34	20	211	137	2.0							
3	46	21	2620	126	1.4							
4	21	30	5090	117	3.6							
5	11	182	1140	108	5.7							
6	6.8	175	644	102	3.8							
7	5.5	253	406	93	2.0							
8	2.5	204	315	86	1.4							
9	.1	121	261	80	1.8							
10	0	88	303	75	2.6							
11	0	124	569	70	2.3							
12	0	223	773	68	1.4	N	N	N	N	N	N	N
13	0	128	968	62	.6	0	0	0	0	0	0	0
14	0	88	503	56	.2							
15	0	66	355	51	.2							
16	0	56	457	46	7.5							
17	0	49	392	42	7.6	F	F	F	F	F	F	F
18	0	54	301	37	6.9	L	L	L	L	L	L	L
19	0	60	371	30	6.2	O	O	O	O	O	O	O
20	33	58	960	26	7.1	W	W	W	W	W	W	W
21	51	56	489	23	10							
22	163	51	384	21	8.5							
23	210	67	605	20	6.4							
24	125	83	434	19	5.5							
25	81	94	367	17	3.0							
26	56	96	294	16	1.5							
27	41	224	247	15	.5							
28	33	145	224	15	0							
29	28	—	195	10	0							
30	25	—	176	7.1	0							
31	23	—	165	—	0	—			—		—	
Mean	32.1	101	657	57.5	3.31	0	0	0	0	0	0	0
Runoff in Ac.Ft.	1980	5630	40410	3420	204	0	0	0	0	0	0	0
	Water Year Total 51645								Calendar Year Total 51644			

U. S. Geological Survey, U. S. Bureau of Reclamation and Division of Water Resources cooperative station located at Dustin Road bridge. Drainage area is 325 square miles. Period of record 1926 to 1933; 1944 to date. Records for 1949 computed by U. S. Geological Survey.

* Also known as Dry Creek at Dustin Road.

TABLE 90

FLOW OF MOKELUMNE RIVER AT LANCHA PLANA - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	89	136	484	686	650	1470	448	452	470	414	603	517
2	48	187	525	686	650	1470	315	483	480	310	612	526
3	47	166	613	680	645	1470	281	463	493	446	487	496
4	65	197	506	528	645	1480	306	462	287	476	491	289
5	50	93	247	605	554	1480	500	465	361	463	489	449
6	46	96	151	590	645	1480	640	347	470	477	277	489
7	42	178	476	567	650	1740	645	237	480	468	468	486
8	76	167	511	570	635	2130	645	450	505	280	475	493
9	87	87	508	680	640	2210	645	490	489	279	460	514
10	127	133	691	680	645	1520	625	468	499	486	482	516
11	136	119	691	680	655	1750	645	469	261	485	504	280
12	195	71	735	626	650	1600	645	469	477	480	477	470
13	219	72	686	670	640	958	650	485	473	523	285	506
14	225	90	680	670	1140	1110	513	174	494	514	487	506
15	157	124	680	670	1540	1350	472	470	492	520	498	512
16	119	103	691	665	1280	1020	269	479	490	281	498	474
17	229	241	691	521	1170	655	215	484	426	472	496	409
18	218	262	691	643	1160	680	444	484	197	514	499	161
19	224	240	696	1710	1160	680	432	481	468	508	498	474
20	252	157	691	2360	844	640	462	478	495	533	244	468
21	233	223	691	2360	480	635	508	163	482	516	491	482
22	113	227	679	2360	396	635	498	445	480	262	334	498
23	57	210	534	2370	464	635	634	464	481	220	529	553
24	208	209	514	2350	461	510	198	475	392	470	394	447
25	207	235	511	2330	990	460	458	461	264	486	534	546
26	247	214	500	2360	1450	568	511	462	476	470	541	516
27	243	144	289	1930	1460	594	460	344	470	467	296	438
28	229	220	564	1140	1470	570	455	159	522	453	498	444
29	96	—	686	650	1420	571	452	447	469	450	483	413
30	260	—	686	650	1040	562	427	453	438	277	514	338
31	246	—	686	—	1470	—	398	437	—	473	—	499
Mean	155	164	580	1133	906	1087	477	423	443	435	465	458
Runoff in Ac.Ft.	9500	9130	35670	67410	55730	64710	29350	25980	26340	26720	27660	28180
	Water Year Total 403270								Calendar Year Total 406460			

U. S. Geological Survey and Division of Water Resources cooperative station located 3 miles downstream from Pardee Dam. Drainage area is 584 square miles. Period of record 1926 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 91

FLOW OF MOKELUMNE RIVER NEAR CLEMENTS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	323						467	426	455	398	472	506
2	83						473	473	480	353	503	535
3	58						289	473	494	418	485	501
4	58						301	462	317	439	452	340
5	68						388	472	387	480	488	445
6	57					Est.	667	388	387	453	346	437
7	52					Mean	675	292	489	470	406	494
8	49					for	675	370	506	379	483	486
9	82					17 Days	679	496	492	244	510	512
10	87					1460	667	464	504	426	472	522
11	128						675	479	334	488	517	388
12	120						675	466	390	488	498	380
13	170						679	437	472	532	346	504
14	205						542	340	488	520	433	508
15	210						504	289	494	516	502	526
16	121						309	469	489	376	510	483
17	126						260	476	428	388	508	464
18	204					724	365	476	286	524	504	270
19	206					746	460	480	353	640	506	323
20	268					695	448	488	492	548	356	460
21	250					679	528	298	502	550	382	474
22	210					675	510	298	462	386	350	509
23	118					675	670	438	477	253	522	555
24	76					554	296	477	412	308	430	492
25	207					487	352	457	321	537	490	518
26	240					612	525	460	406	484	545	538
27	250					632	464	408	472	496	334	464
28	296					602	470	241	512	444	485	442
29	204	—				615	464	286	514	416	456	447
30	106	—				610	456	448	430	317	529	346
31	186	—		—		—	418	452	—	390	—	468
Mean	155	e165	e600	e1150	e905	1104	495	420	442	441	461	462
Runoff in Ac.Ft.	9560	9160	36890	68430	55650	65700	30450	25850	26310	27100	27410	28440
	Water Year Total 408350								Calendar Year Total 410950			

U. S. Geological Survey and Division of Water Resources cooperative station located 1 mile north of Clements, 700 feet upstream from the highway bridge. Drainage area is 630 square miles. Period of record 1904 to date. Records for 1949 computed by U. S. Geological Survey.
e Estimated.

TABLE 92

FLOW OF MOKELUMNE RIVER AT WOODBRIDGE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	580	204	192	673	282	1020	67	27	25	191	200	493
2	232	165	427	673	286	1030	39	26	44	188	259	489
3	130	157	725	673	269	1010	32	26	149	118	263	497
4	95	166	1040	593	240	980	28	26	102	180	257	471
5	82	191	588	546	214	879	25	25	24	208	266	305
6	81	124	316	378	191	963	27	25	23	210	271	419
7	72	110	190	62	258	1060	85	25	44	210	139	453
8	66	159	429	208	322	1360	145	25	129	236	209	470
9	63	171	499	337	242	1720	182	25	179	110	324	475
10	85	103	579	394	241	1540	210	25	156	70	355	493
11	123	118	697	372	218	1060	190	25	155	204	332	511
12	141	125	757	322	158	1340	177	26	34	245	365	301
13	163	89	831	277	179	961	165	39	91	263	360	430
14	198	75	714	294	257	317	124	185	146	309	233	475
15	228	88	697	320	1050	890	56	25	138	308	318	479
16	179	85	694	403	1040	742	37	23	146	304	345	479
17	157	93	697	365	785	450	28	24	172	157	358	468
18	192	189	692	170	730	262	25	24	137	220	365	405
19	222	236	702	562	726	283	25	32	36	301	367	226
20	231	220	747	1410	718	269	25	116	68	360	371	399
21	226	172	704	1860	309	181	25	84	139	311	795	432
22	230	180	699	1930	136	175	27	25	147	302	510	464
23	152	210	609	1990	46	173	34	23	143	148	350	480
24	113	218	544	2020	37	159	83	24	150	77	491	516
25	146	194	518	1990	32	79	27	27	103	165	403	450
26	191	205	514	1940	739	78	25	30	43	220	497	504
27	232	229	498	1930	961	138	26	120	106	217	493	471
28	244	158	326	1390	1010	134	27	59	146	225	313	430
29	242	—	598	569	1020	112	27	23	224	230	459	421
30	140	—	664	330	996	98	27	22	209	234	452	416
31	109	—	673	—	985	—	27	23	—	128	—	329
Mean	172	158	599	833	473	649	66.0	39.8	114	214	357	440
Runoff in Ac.Ft.	10600	8790	36810	49550	29110	38600	4060	2450	6760	13190	21260	27080
	Water Year Total 242180								Calendar Year Total 248260			

U. S. Geological Survey and Division of Water Resources cooperative station located 0.4 mile below diversion dam of Woodbridge Irrigation District. Drainage area is 644 square miles. Period of record 1924 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 93

FLOW OF BEAR CREEK NEAR LOCKEFORD - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		0	2.8	2.6	0	0	0	0	0			
2		0	82	2.0	0	0	0	0	0			
3		0	655	1.6	0	0	0	0	0.1			
4		0	213	1.2	0	0	0	0	.1			
5		0	52	1.0	0	0	0	0	0			
6		0	35	.8	0	0	0	0	0			
7		6.2	23	.4	0	0	0	0	0			
8		6.3	20	.2	0	0	0	0	0			
9		1.8	30	.2	0	0	.1	0	0			
10		.8	70	.2	0	0	.2	0	0			
11		.4	200	.2	.1	0	.1	0	0			
12	N	.3	100	.1	.2	0	0	0	0	N	N	N
13	O	.2	50	.1	.1	0	0	0	0	O	O	O
14		.2	25	.1	0	0	0	0	0			
15		.2	16	.1	0	0	0	.1	0			
16		.1	14	.1	0	0	0	0	0			
17	F	.1	12	.1	0	0	0	0	0	F	F	F
18	L	.1	7.7	.1	0	0	0	0	0	L	L	L
19	O	.1	38	.1	0	0	0	0	0	O	O	O
20	W	0	48	.1	0	0	0	0	0	W	W	W
21		0	16	0	0	0	0	0	0			
22		0	12	0	0	0	0	0	0			
23		0	17	0	0	0	0	0	0			
24		.5	9.8	0	0	0	0	.1	0			
25		.5	7.0	.7	0	.2	0	0	0			
26		15	5.6	.2	0	.1	0	0	0			
27		11	4.7	.1	0	0	0	0	0			
28		5.3	3.9	.1	0	0	0	0	0			
29		—	3.2	.1	.1	0	0	0	0			
30		—	2.6	0	0	0	0	0	0			
31		—	2.4	—	0	—	0	0	—		—	
Mean	0	1.75	57.3	.42	.02	.01	.01	.01	.01	0	0	0
Runoff in Ac.Ft.	0	97	3530	25	1.0	.6	.8	.4	.4	0	0	0
	Water Year Total 3656								Calendar Year Total 3655			

U. S. Geological Survey station located at County Road bridge 0.8 mile southeast of Lockeford. Drainage area is 48.4 square miles. Period of record 1930 to 1933; 1943 to date. (Prior records available at a site 3 miles downstream.) Records for 1949 computed by U. S. Geological Survey.

TABLE 94

FLOW OF CALAVERAS RIVER AT JENNY LIND - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	53	49	31	287	118	66	44			0	23	4.8
2	55	48	34	268	113	64	31			0	25	62
3	100	49	517	247	108	63	22			0	22	6.2
4	85	56	1190	232	106	61	20			0	18	0
5	61	160	1270	225	104	61	16			0	24	0
6	46	241	1120	220	100	63	13			0	8.2	0
7	43	460	955	218	98	61	11			0	.4	0
8	40	437	806	157	96	56	8.7			0	0	0
9	38	212	655	66	91	56	5.1			0	0	0
10	36	148	530	66	91	55	1.4			0	0	0
11	33	163	558	66	89	49	2.0			0	0	0
12	29	370	976	56	85	48	.5	N	N	0	0	0
13	28	241	1180	44	81	50	0	0	0	0	0	0
14	28	166	1170	39	79	48	0			0	0	0
15	28	128	1030	39	76	45	0			0	0	0
16	29	111	905	39	76	44	0			0	0	11
17	27	102	788	38	74	42	0	F	F	0	0	20
18	26	123	651	36	72	40	0	L	L	0	16	24
19	26	158	637	36	70	40	0	0	0	0	38	36
20	32	163	634	67	70	38	0	W	W	0	9.0	84
21	79	166	614	120	70	50	0			0	.1	75
22	128	132	582	125	66	93	0			0	0	52
23	268	46	604	125	64	558	0			0	16	39
24	198	46	716	123	63	815	0			0	7.0	32
25	123	48	606	123	60	716	0			0	4.9	28
26	83	61	562	125	58	606	0			0	0	26
27	66	76	502	125	58	467	0			0	0	23
28	60	58	432	123	58	214	0			0	0	22
29	53	—	359	120	74	130	0			0	60	26
30	52	—	335	118	72	74	0			0	6.6	75
31	50	—	313	—	70	—	0		—	1.8	—	64
Mean	64.6	151	686	122	81.0	160	5.64	0	0	.06	9.27	22.9
Runoff in Ac.Ft.	3970	8370	42170	7290	4930	9530	347	0	0	4	552	1410
	Water Year Total 79638								Calendar Year Total 78623			

U. S. Geological Survey and Division of Water Resources cooperative station located 0.2 mile south of Jenny Lind at Milton Road bridge. Drainage area is 395 square miles. Period of record 1907 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 95

FLOW OF CALAVERAS RIVER AT BELLOTA - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	22	e18	22	43	74	16	20					0
2	17	e18	28	42	70	20	13					0
3	e27	e18	11	40	70	26	5.6					0
4	e29	e19	4.0	39	68	23	2.7					0
5	e28	e19	80	39	67	22	e.1					0
6	e26	e24	86	39	68	20	0					0
7	e24	e38	84	39	68	23	0					0
8	e21	e36	76	36	68	15	0					0
9	e19	e24	69	28	66	17	0					0
10	e15	e30	60	25	62	20	0					0
11	12	e39	61	25	54	20	0					0
12	13	e58	87	25	48	22	0	N	N	N	N	0
13	e15	e64	95	24	23	21	0	0	0	0	0	0
14	e13	e35	92	23	8.6	21	0					0
15	e13	30	90	22	14	17	0					0
16	e12	29	79	20	29	5.6	0					0
17	e13	28	72	20	35	2.2	0	F	F	F	F	0
18	e14	28	65	20	33	.8	0	L	L	L	L	0
19	e16	31	64	19	27	2.5	0	0	0	0	0	0
20	e18	33	68	20	19	2.3	0	W	W	W	W	0
21	e20	33	64	25	20	7.4	0					e.1
22	e25	33	62	26	20	11	0					e.6
23	e36	25	65	27	20	17	0					e.5
24	e39	21	70	27	20	e69	0					e.5
25	e33	21	66	32	20	e65	0					e.5
26	e31	22	62	50	20	60	0					e.5
27	e28	26	59	71	20	54	0					e.5
28	e26	24	54	74	15	42	0					e.5
29	e24	—	48	75	19	31	0					e.5
30	e21	—	46	75	28	24	0					e.4
31	e20	—	43	—	21	—	0		—		—	e.5
Mean	21.6	29.4	62.3	35.7	38.5	23.2	1.3	0	0	0	0	.2
Runoff in Ac.Ft.	1329	1634	3832	2122	2369	1382	82	0	0	0	0	10
	Water Year Total 13040								Calendar Year Total 12760			

Division of Water Resources station located just below the highway bridge at site of the Old Linden Irrigation District station. Flows in the Calaveras River and in Mormon Slough are regulated by headgates near Bellota. For 10 years prior to December 1948, all except flood flows passed through Mormon Slough. Period of record 1948 to date.
e Estimated.

TABLE 96

FLOW OF CALAVERAS RIVER NEAR STOCKTON - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0.7	0.5	7.3	e24	0.5	0					
2	0	0.7	11	8.9	e24	0.5	0.4					
3	0	0.7	17	6.1	11	0.5	0					
4	0	0.8	46	4.0	14	0.5	0					
5	0	0.8	25	6.3	18	0.5	0					
6	0	0.8	54	2.3	21	0.5	0					
7	0	3.4	58	3.1	19	0.5	0					
8	0	14	51	0.7	26	0.5	0					
9	0	31	e45	2.1	28	0.5	0					
10	0	e30	e41	25	16	0.5	0					
11	0	e8.2	e39	22	10	0.5	0					
12	0	e5.9	49	6.7	9.2	0.5	0	N	N	N	N	N
13	0	e14	72	3.1	4.3	0.5	0	0	0	0	0	0
14	0	e22	70	6.2	3.8	0	0					
15	0	e16	64	2.0	2.0	0	0					
16	0	11	51	2.3	1.8	0	0					
17	0	9.8	45	1.8	1.6	0	0	F	F	F	F	F
18	0	9.7	e41	2.2	0.6	0	0	L	L	L	L	L
19	0	9.7	36	3.8	0.6	0	0	0	0	0	0	0
20	0	9.7	45	7.8	0.6	0	0	W	W	W	W	W
21	0	9.4	41	5.0	0.6	0	0					
22	0	12	29	0.6	0.6	0	0					
23	0	e8.0	45	0.5	1.0	0	0					
24	0	e0.9	27	0.5	0.8	0	0					
25	e4.0	0.5	12	2.1	0.8	0	0					
26	e5.0	0.5	36	3.8	0.6	18	0					
27	e3.1	0.5	34	2.4	0.9	6.4	0					
28	e1.7	0.5	33	6.1	0.5	0.3	0					
29	0.7	—	28	17	0.5	0	0					
30	0.7	—	30	e23	0.5	0	0					
31	0.7	—	7.7	—	0.5	—	0		—		—	
Mean	0.5	8.3	38.2	6.2	7.8	1.0	-	0	0	0	0	0
Runoff in Ac.Ft.	32	459	2347	366	482	62	1	0	0	0	0	0
	Water Year Total ----								Calendar Year Total 3749			

Division of Water Resources station located at McAllen Road bridge 1.0 mile above the mouth of Stockton Diverting Canal. Station was moved on June 15 to a location approximately 2 miles upstream. Flows in the Calaveras River are regulated by headgates near Bellota. For 10 years prior to December 1948, all but flood flows of the Calaveras River by-passed this station via Mormon Slough and the Stockton Diverting Canal. Period of record 1948 to date.
e Estimated.

TABLE 97

FLOW OF MORMON SLOUGH AT BELLOTA - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	e61	14	18	241	24	24	20					0
2	e61	9.8	62	223	19	12	3.6					0
3	e64	13	e1030	206	18	11	1.6					0
4	70	18	e1750	e188	15	5.2	1.3					0
5	47	47	1360	e163	13	11	1.3					0
6	31	177	1170	e140	12	4.8	.6					0
7	19	282	938	e113	13	9.8	.4					0
8	14	437	757	e90	12	9.0	.2					0
9	11	208	607	e70	9.0	12	0					0
10	8.4	119	471	e52	9.0	6.7	0					0
11	e5.4	101	478	e37	11	12	0					0
12	e5.1	244	1010	32	11	14	0	N	N	N	N	0
13	e4.8	e234	1220	16	26	9.8	0	0	0	0	0	0
14	e4.6	e157	1180	11	44	8.4	0					0
15	e4.4	117	1020	9.0	40	6.4	0					0
16	e3.6	96	866	6.7	20	6.7	0					0
17	e3.6	79	736	7.6	15	5.1	0	F	F	F	F	0
18	3.2	86	607	6.4	7.0	4.8	0	L	L	L	L	0
19	3.4	115	588	5.8	13	5.4	0	0	0	0	0	0
20	2.7	133	690	7.0	13	5.1	0	W	W	W	W	0
21	5.4	127	561	64	15	2.0	0					0
22	60	113	517	77	15	15	0					2.6
23	161	40	576	77	13	127	0					8.2
24	179	19	646	83	6.4	662	0					6.7
25	117	19	546	67	7.0	595	0					6.4
26	84	26	499	40	8.4	524	0					6.4
27	45	58	447	24	5.8	e413	0					6.4
28	32	37	393	31	9.8	e266	0					5.9
29	e22	—	346	27	26	144	0					5.5
30	e17	—	288	28	18	56	0					19
31	e12	—	266	—	21	—	0		—		—	56
Mean	37.5	111.6	698.2	71.4	15.8	99.6	2.6	0	0	0	0	4.0
Runoff in Ac.Ft.	2303	6200	42930	4250	971	5925	58	0	0	0	0	244
	Water Year Total 63529								Calendar Year Total 62881			

Division of Water Resources station located just below the Bellota-Escalon Road bridge. Flows in Mormon Slough and Calaveras River are regulated by headgates near Bellota. For 10 years prior to December 1948, all except flood flows of the Calaveras River passed through Mormon Slough. Period of record 1948 to date.
e Estimated.

TABLE 98

FLOW OF STOCKTON DIVERTING CANAL AT STOCKTON* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20	6.0	7.0	240	3.0	0	19					
2	7	5.5	2.3	217	1.5	0	2.7					
3	5	1.5	804	198	0	0	0					
4	60	0	2000	180	0	0	0					
5	30	3.0	1250	166	0	0	0					
6	18	80	1070	158	0	0	0					
7	10	192	912	158	0	0	0					
8	7	485	780	150	0	0	0					
9	5	268	675	86	0	0	0					
10	4	140	555	30	0	0	0					
11	2.5	90	515	25	0	0	0					
12	1.5	220	949	20	0	0	0	N	N	N	N	N
13	.5	170	1240	18	0	0	0	0	0	0	0	0
14	0	120	1090	7.5	0	0	0					
15	0	90	966	2.5	15	0	0					
16	0	72	840	.2	21	0	0					
17	0	55	741	0	5.6	0	0	F	F	F	F	F
18	0	47	631	0	0	0	0	L	L	L	L	L
19	0	69	555	0	0	0	0	0	0	0	0	0
20	0	99	900	0	0	0	0	W	W	W	W	W
21	2	101	702	0	0	0	0					
22	50	99	587	40	0	0	0					
23	150	60	719	57	0	0	0					
24	190	9.5	719	58	0	513	0					
25	120	.8	626	60	0	626	0					
26	60	.2	555	36	0	560	0					
27	37	19	500	11	0	470	0					
28	22	27	450	6.3	0	307	0					
29	17	—	356	6.7	0	150	0					
30	12	—	307	4.6	0	58	0					
31	9.5	—	280	—	0	—	0		—		—	
Mean	27.1	90.3	719	64.5	1.49	89.5	.70	0	0	0	0	0
Runoff in Ac.Ft.	1670	5020	44200	3840	91	5320	43	0	0	0	0	0
	Water Year Total 60531								Calendar Year Total 60184			

U. S. Geological Survey, U. S. Bureau of Reclamation and Division of Water Resources cooperative station located at Sanguinetti Lane bridge near the mouth of the Canal. For 10 years prior to December 1948, flows of Calaveras River were diverted to the Stockton Canal via Mormon Slough. Period of record 1944 to date. Records for 1949 computed by U. S. Geological Survey.
* Also known as Calaveras River at Stockton.

TABLE 99

INFLOW TO FRIANT RESERVOIR (MILLERTON LAKE) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	219	578	917	1627	3929	2904	1885	1293	1210	551	218	968
2	401	587	1240	1814	4917	3194	1832	1426	1188	510	210	1147
3	606	543	1502	1883	4888	3541	1289	1277	1245	706	249	864
4	669	757	3131	1874	4138	3419	1559	1371	1065	743	169	590
5	596	316	1389	2260	4077	3501	2024	1316	995	560	232	943
6	609	189	857	2595	3973	4215	1679	1244	1135	713	300	1023
7	685	841	1108	2249	4254	4889	1340	1154	1062	643	156	952
8	315	736	1191	2267	4177	5146	1320	1133	971	561	92	888
9	292	684	1255	2335	3551	5297	1343	1252	1051	466	413	835
10	853	760	1236	2578	3256	5419	909	1104	736	544	698	633
11	771	816	2645	2680	3383	5248	1478	1230	625	543	610	493
12	444	795	2003	2892	4588	4882	1421	1272	977	569	329	680
13	761	539	1886	3266	5143	4365	1567	1186	864	614	208	672
14	865	846	1526	3573	5984	4252	1174	546	1011	656	237	678
15	451	970	1850	3819	4228	3933	1399	1132	993	520	188	679
16	375	736	1933	3218	3847	3621	1225	1279	865	367	218	719
17	490	780	1990	3784	4967	3257	1265	1442	848	588	384	694
18	604	861	1880	3560	5500	2761	1339	1180	626	657	405	599
19	956	736	1846	3598	4326	2207	1347	1397	962	650	401	646
20	822	819	1603	3656	3807	2450	1288	1089	1000	783	294	802
21	853	976	1632	4196	3242	2396	1300	891	1011	728	357	701
22	493	722	1659	4969	3121	2360	1386	1284	828	646	571	638
23	411	1076	1949	5273	4158	2383	1259	1351	846	453	572	569
24	676	1104	1905	4849	5175	2377	1303	1318	547	455	398	587
25	874	1124	1805	5546	5877	2293	1495	1187	538	521	519	487
26	600	685	1390	4161	6524	1845	1655	1274	757	437	601	507
27	685	1020	1283	3908	6699	2183	1358	1283	785	556	614	598
28	448	1087	1422	4476	6130	2385	1428	1118	865	615	739	618
29	593	—	1900	4311	5166	2280	1493	1173	812	574	945	754
30	265	—	1928	3851	3835	1869	1111	1248	776	275	940	721
31	505	—	1844	—	3616	—	1220	1242	—	171	—	624
Mean	587	776	1668	3369	4531	3362	1409	1216	906	560	410	720
Runoff in Ac.Ft.	36073	43107	102555	200465	278630	200077	86660	74761	53938	34463	24391	44249
	Water Year Total 1208946								Calendar Year Total 1179369			

This is the total mean second-feet flow inflowing to Friant Reservoir as computed by the U. S. Bureau of Reclamation, taking into account change in storage, release, spill and evaporation; and represents the natural flow passing the dam site if the dam had not been constructed. Flows shown also include Cottonwood Creek (Table 111). Drainage area is 1671 square miles.

TABLE 100

DAILY CONTENT OF FRIANT RESERVOIR (MILLERTON LAKE) IN ACRE-FEET - 1949

Date	Figure given is amount in storage at end of day in thousands of acre-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	158.0	181.5	185.0	230.8	272.3	411.2	403.5	257.8	140.8	73.5	46.7	50.4
2	158.3	181.8	185.2	231.7	275.6	412.1	400.2	253.0	138.3	71.4	46.0	51.9
3	159.0	181.9	186.5	232.8	278.8	413.4	396.0	248.1	135.8	70.0	45.5	52.9
4	159.8	182.4	191.4	233.4	280.5	414.1	392.3	243.5	133.1	69.1	44.8	53.4
5	160.6	182.0	193.2	233.7	282.0	414.9	390.0	238.7	130.3	67.8	42.3	54.4
6	161.4	181.4	193.9	234.0	283.4	417.3	386.3	233.8	127.7	66.9	43.9	55.5
7	162.4	182.1	194.9	233.6	285.3	421.4	382.3	228.8	125.1	65.8	43.3	56.5
8	162.7	182.6	195.5	233.1	287.0	425.9	378.2	223.9	122.3	64.5	42.6	57.3
9	163.0	183.0	195.9	232.5	287.7	430.6	374.0	219.6	119.8	63.1	42.7	58.1
10	164.3	183.5	196.2	232.3	288.3	435.0	368.6	214.9	116.8	61.9	43.4	58.4
11	165.6	184.1	199.4	232.3	289.3	439.0	364.1	210.5	113.7	60.6	44.0	58.4
12	166.2	184.4	201.2	232.3	293.2	442.2	359.2	206.3	111.0	59.5	44.0	58.8
13	167.4	184.3	202.9	232.7	298.7	444.3	354.5	202.2	108.2	58.4	43.8	59.0
14	168.8	184.8	203.8	233.8	305.9	445.6	349.1	196.8	106.1	57.4	43.7	59.0
15	169.3	185.5	205.3	235.2	309.7	445.8	344.1	192.5	104.0	56.2	43.5	59.0
16	169.8	185.8	207.0	235.6	312.8	445.5	338.8	188.8	102.0	54.7	43.3	59.1
17	170.4	186.2	208.8	237.0	318.3	444.5	333.5	185.4	100.1	53.6	43.4	59.1
18	171.3	186.5	210.3	238.0	325.2	441.8	328.4	181.8	97.9	52.9	43.6	59.0
19	172.9	186.4	211.6	239.2	330.9	438.5	323.5	178.8	96.3	52.6	43.6	58.9
20	174.2	186.4	212.4	240.6	336.1	435.5	318.3	175.4	94.9	52.6	43.3	59.1
21	175.6	186.8	213.4	243.1	340.2	432.2	313.5	171.7	93.6	52.4	43.3	59.2
22	176.3	186.7	214.6	247.0	344.0	428.7	308.7	168.7	92.2	52.2	43.6	59.3
23	176.8	187.3	216.6	251.3	349.8	425.5	303.7	165.8	90.4	51.5	44.0	59.8
24	177.9	187.0	218.5	254.7	357.8	422.9	298.9	162.9	87.8	50.8	44.1	60.4
25	179.3	187.2	220.5	259.7	366.9	420.1	294.2	159.7	85.4	50.2	44.4	60.9
26	180.2	186.6	221.8	262.3	377.5	416.5	289.4	156.7	83.4	49.6	44.9	61.4
27	181.3	186.1	222.9	264.3	388.8	413.5	284.1	153.9	81.2	49.2	45.4	62.2
28	181.6	185.7	224.3	267.3	398.0	411.3	279.0	150.9	79.2	49.1	46.3	63.2
29	181.3	—	226.5	269.6	404.5	409.4	274.1	148.2	77.4	49.0	47.6	64.3
30	181.3	—	228.3	271.0	407.7	406.5	269.4	145.8	75.6	48.4	49.0	65.5
31	181.3	—	229.9	—	410.4	—	263.4	143.4	—	47.5	—	66.5
Monthly Change	+23.3	+4.4	+44.2	+41.1	+139.4	-3.9	-143.1	-120.0	-67.8	-28.1	+1.5	+17.5

Annual Gain or Loss in Storage: Calendar Year -91500 Acre-Feet; Water year -77700 Acre-Feet.

Differences in Storage 1948 to 1949: Maximums -27600 Acre-Feet; Minimums -82400 Acre-Feet.

Reservoir water level recorder maintained by U. S. Bureau of Reclamation and U. S. Geological Survey. Period of record 1941 to date. Records for 1949 computed by U. S. Bureau of Reclamation.

TABLE 101

FLOW OF SAN JOAQUIN RIVER BELOW FRIANT - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	241	482	1260	956	2990	2760	2550	2740	1680	1600	599	280
2	241	436	1150	1100	3010	2460	2730	2660	1660	1580	568	362
3	241	468	850	1100	3010	2540	2730	2530	1660	3170	500	362
4	241	495	631	1320	3020	2750	2720	2510	1650	1200	500	366
5	241	490	495	1870	3020	2740	2710	2530	1640	1190	500	398
6	214	490	495	2200	3020	2650	2710	2540	1630	1180	495	465
7	152	490	586	2220	3020	2520	2700	2530	1620	1180	451	465
8	150	490	891	2310	3020	2530	2700	2420	1610	1180	402	465
9	150	490	1050	2410	2940	2610	2700	2310	1630	1170	407	470
10	150	490	1050	2420	2680	2810	2690	2300	1670	1160	364	470
11	150	525	1050	2490	2590	2870	2730	2300	1660	1160	305	470
12	150	599	1060	2710	2390	2870	2860	2240	1770	1150	305	475
13	150	599	1060	2890	2080	2890	2860	2180	1700	1140	305	574
14	150	599	1060	2890	2080	3170	2850	2200	1530	1140	305	676
15	150	599	1060	2890	2090	3330	2850	2170	1520	1140	301	676
16	150	599	1060	2890	2040	3330	2840	2080	1460	1120	301	676
17	150	599	1060	2900	1980	3320	2830	2000	1460	1110	301	676
18	150	690	1110	2900	1770	3540	2810	1900	1460	1000	347	676
19	152	782	1180	2850	1250	3320	2740	1790	1410	795	398	688
20	150	782	1190	2780	986	3380	2750	1780	1320	795	398	632
21	150	776	1130	2800	986	3430	2620	1770	1340	795	398	682
22	150	776	949	2830	986	3430	2620	1760	1340	788	402	577
23	150	742	795	2890	986	3310	2610	1790	1610	788	384	326
24	150	810	795	2900	993	3010	2600	1800	1750	782	346	241
25	150	1210	702	2810	993	2990	2680	1800	1740	782	349	241
26	150	1260	604	2660	952	2990	2790	1790	1740	776	349	241
27	150	1260	604	2660	814	2990	2790	1780	1890	743	349	203
28	285	1260	604	2690	1210	2800	2780	1770	1350	652	304	152
29	495	—	667	2800	1690	2500	2780	1730	1680	604	247	161
30	495	—	814	2980	2000	2190	2750	1680	1670	604	247	129
31	495	—	821	—	2000	—	2740	1680	—	604	—	99
Mean	205	689	898	2471	2019	2928	2736	2099	1612	1009	381	433
Runoff in Ac.Ft.	12580	38260	55210	147000	124200	174200	168200	129000	95900	62040	22670	26630
	Water Year Total 1068370								Calendar Year Total 1055890			

U. S. Geological Survey station located at Mile 268.13L and 1.5 miles downstream from Cottonwood Creek. Daily mean release from Friant Reservoir into San Joaquin River is obtainable from this table by subtracting flows of Cottonwood Creek (Table 111). Drainage area is 1675 square miles. Period of record 1938 to date. (Prior records available at sites 2.5 and 4.5 miles upstream.) Records for 1949 computed by U. S. Geological Survey.

TABLE 102

FLOW OF SAN JOAQUIN RIVER AT WHITEHOUSE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	248	430	1240	801	2760	1780	2270	2420	1430	1470	545	208
2	244	438	1250	818	2770	1960	2290	2400	1410	1460	525	196
3	252	418	1240	990	2770	2190	2430	2330	1400	1450	520	286
4	252	418	995	1020	2760	2300	2410	2200	1400	1380	470	343
5	252	446	804	1120	2730	2480	2390	2170	1400	1160	450	347
6	248	464	574	1580	2790	2490	2370	2180	1390	1120	415	351
7	241	477	540	1930	2800	2430	2360	2220	1380	1090	445	395
8	210	486	490	2000	2810	2280	2360	2230	1360	1090	425	440
9	178	482	671	2080	2810	2280	2340	2130	1350	1090	395	410
10	174	486	896	2000	2730	2330	2330	2010	1360	1090	366	427
11	171	482	978	2230	2510	2490	2350	2000	1410	1090	356	450
12	168	486	1060	2270	2420	2550	2380	2000	1410	1090	307	450
13	164	531	1040	2460	2480	2590	2480	1970	1450	1080	284	460
14	157	562	1040	2630	1990	2590	2490	1920	1470	1070	268	465
15	157	572	1010	2650	1940	2800	2490	1930	1310	1060	264	584
16	157	572	990	2660	1960	2960	2480	1900	1300	1060	256	644
17	160	576	996	2680	1910	2970	2490	1820	1240	1060	252	660
18	157	580	1000	2700	1850	2980	2470	1740	1250	1040	248	666
19	157	590	1040	2720	1770	3170	2450	1690	1250	1020	244	682
20	160	683	1130	2680	1400	3040	2420	1560	1230	807	298	694
21	160	733	1180	2640	1070	3090	2400	1550	1150	746	330	699
22	157	779	1120	2650	996	3120	2310	1540	1130	740	330	694
23	157	784	1010	2670	954	3140	2300	1510	1140	734	330	660
24	160	790	885	2710	930	3040	2300	1510	1260	734	330	414
25	160	745	845	2730	912	2790	2300	1520	1470	734	302	312
26	160	1020	796	2660	869	2760	2340	1520	1490	734	284	264
27	160	1200	685	2510	862	2760	2410	1510	1500	728	280	248
28	157	1220	650	2500	746	2760	2410	1500	1610	716	280	240
29	157	—	655	2500	879	2590	2440	1510	1630	647	280	204
30	257	—	650	2600	1380	2320	2430	1480	1470	586	240	168
31	402	—	762	—	1730	—	2420	1420	—	560	—	158
Mean	193	623	910	2206	1908	2634	2392	1851	1368	982	345	428
Runoff in Ac.Ft.	11889	34612	55978	131284	117338	156754	147114	113831	81421	60369	20527	26339
	Water Year Total 969660								Calendar Year Total 957456			

San Joaquin Canal Company station located at Mile 219.83R, below the head of Gravelly Ford Canal. Period of record 1909 to date. Records for 1949 computed by San Joaquin Canal Company.

TABLE 103

FLOW OF SAN JOAQUIN RIVER NEAR MENDOTA - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	282	16	170	200	318	173	339	309	288	168	66	68
2	200	16	200	205	315	185	330	309	291	165	64	101
3	30	16	202	218	315	190	327	312	291	160	66	127
4	86	16	185	215	315	195	324	303	291	156	64	165
5	160	16	153	215	315	202	321	303	291	139	64	148
6	205	16	151	215	309	218	312	306	291	91	62	116
7	202	14	156	225	312	242	312	309	268	72	58	62
8	172	24	158	238	315	260	321	303	242	72	57	36
9	120	44	156	265	297	285	336	291	238	72	55	75
10	56	44	156	265	279	306	339	276	238	77	42	112
11	20	42	160	265	260	336	339	279	235	83	42	110
12	20	41	175	268	248	339	339	279	238	85	42	112
13	19	37	195	265	252	345	330	279	230	91	42	123
14	17	42	202	270	235	375	327	279	215	91	42	139
15	17	64	205	291	212	372	330	282	205	89	42	137
16	17	75	200	324	202	390	330	285	205	87	41	139
17	17	93	202	333	190	420	327	282	205	87	41	141
18	17	93	215	336	185	420	327	282	205	89	39	139
19	17	93	230	345	192	417	324	279	205	97	37	141
20	17	93	235	342	182	414	330	279	205	108	36	132
21	34	93	228	339	172	411	333	276	202	114	34	119
22	58	95	220	336	168	408	333	273	202	119	34	116
23	77	97	190	342	158	387	333	273	202	119	36	108
24	89	99	156	333	156	381	330	273	195	119	36	75
25	87	97	151	333	170	366	330	279	195	116	36	75
26	60	99	153	330	172	366	327	285	195	116	37	77
27	20	119	156	330	168	366	327	288	195	105	37	75
28	17	158	168	327	165	366	321	291	195	91	37	75
29	14	—	160	324	163	366	315	288	190	93	39	73
30	13	—	165	318	165	357	309	288	175	93	39	52
31	13	—	178	—	172	—	312	288	—	81	—	23
Mean	70.1	62.6	182	287	228	329	327	288	227	105	45.6	103
Runoff in Ac.Ft.	4310	3480	11170	17080	14050	19560	20100	17710	13530	6440	2710	6330
	Water Year Total 140860								Calendar Year Total 136470			

U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station located 2.5 miles below Mendota Dam at Mile 206.2L. Drainage area is 4310 square miles. Period of record 1939 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 104

FLOW OF SAN JOAQUIN RIVER NEAR DOS PALOS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	260	2.4	1.2	1.0	4.4	2.3	2.7	1.7	1.3	.4	.2	0.1
2	250	3.1	1.2	1.1	4.6	2.4	2.5	1.6	1.3	.4	.2	.1
3	111	4.4	1.2	1.0	4.6	2.4	2.7	1.6	1.2	.4	.2	.5
4	56	3.2	1.2	1.0	4.4	2.5	2.8	1.5	1.3	.4	.2	1.0
5	88	1.5	1.2	.9	4.2	2.5	2.8	1.4	1.5	.4	.3	1.5
6	138	1.4	1.1	.8	4.2	2.5	2.7	1.4	1.8	.4	.4	2.0
7	164	1.3	1.2	.9	4.0	3.7	2.3	1.6	1.7	.3	.4	2.5
8	169	1.3	1.1	.9	4.4	5.5	2.3	1.8	1.6	.2	.4	2.9
9	148	1.3	1.1	1.0	4.6	7.1	2.3	1.9	1.4	.1	.5	2.4
10	108	1.7	1.0	1.2	3.9	8.0	2.3	1.8	1.3	.2	.7	2.3
11	80	1.8	1.1	1.0	3.7	6.5	2.3	1.6	1.3	.2	.6	2.0
12	57	1.9	1.2	1.0	3.4	6.1	2.2	1.5	1.3	.2	.6	1.9
13	46	1.9	1.2	1.0	3.1	5.1	2.1	1.4	1.2	.2	.6	2.0
14	37	2.0	1.3	1.1	3.1	4.4	1.9	1.3	1.2	.3	.5	1.9
15	38	2.0	1.6	1.1	2.8	5.3	1.9	1.4	1.1	.3	.5	2.3
16	34	2.3	1.5	1.9	2.5	5.3	2.1	1.5	1.0	.3	.4	2.4
17	33	2.5	1.5	4.4	2.3	5.7	2.0	1.5	.9	.3	.4	2.5
18	31	3.0	1.4	4.6	2.1	6.1	2.0	1.4	.9	.4	.4	2.8
19	31	2.7	1.7	4.8	11	5.9	2.0	1.3	.9	.2	.3	2.9
20	31	.7	1.7	4.9	19	5.9	2.1	1.3	.8	.2	.2	2.8
21	36	.7	1.7	5.1	3.1	3.5	2.2	1.2	.8	.2	.1	2.7
22	50	.7	1.7	4.9	2.8	2.2	2.4	1.2	.7	.1	.1	2.7
23	83	.7	1.5	4.9	2.8	2.7	2.4	1.2	.6	.2	.1	2.4
24	65	.8	1.4	5.5	2.4	2.7	2.4	1.2	.4	.2	.1	2.4
25	68	.8	1.3	4.6	2.3	2.7	2.5	1.4	.4	.2	.1	2.2
26	69	.9	1.2	4.6	2.5	2.7	1.9	1.4	.4	.2	.1	2.0
27	58	.8	1.2	4.6	2.3	2.7	1.5	1.4	.4	.2	.1	1.9
28	36	.9	1.3	4.6	2.3	2.5	1.6	1.7	.4	.3	.1	1.8
29	26	—	1.5	4.6	2.4	2.5	1.7	1.8	.4	.4	.1	1.7
30	3.9	—	1.3	4.4	2.4	2.5	1.7	1.7	.4	.2	.1	1.5
31	2.8	—	1.2	—	2.4	—	1.7	1.5	—	.2	—	13
Mean	77.7	1.74	1.32	2.78	4.00	4.06	2.19	1.49	1.00	.26	.30	2.36
Runoff in Ac.Ft.	4780	97	81	165	246	242	135	92	59	16	18	145
	Water Year Total 6230								Calendar Year Total 6076			

U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station located 800 feet downstream from the head of Temple Slough at Mile 186.0L. Drainage area is 5630 square miles. Period of record 1940 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 105

FLOW OF SAN JOAQUIN RIVER NEAR EL NIDO - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15	0.5	.4	0	0.4							
2	75	.3	.2	0	.8							
3	74	.3	.2	.1	1.1							
4	35	.3	.3	.2	.2							
5	16	.4	1.0	.6	0							
6	30	.3	1.4	0	0							
7	51	.5	1.7	0	0							
8	63	.2	2.4	0	.6							
9	64	2.	1.3	0	1.8							
10	52	1.4	1.1	0	1.4							
11	35	2.1	.9	0	.4							
12	24	1.7	2.2	0	0	N						
13	15	.8	2.8	0	0	0	Station discontinued June 30, 1949					
14	10	.1	2.8	0	0							
15	9.0	0	1.3	0	0							
16	7.8	0	.6	0	0							
17	6.3	0	0	0	.8	F						
18	5.6	0	0	0	0	L						
19	5.2	0	.2	0	.3	0						
20	6.1	0	.2	0	.8	W						
21	4.8	0	.2	0	1.4							
22	4.8	0	1.3	.1	1.2							
23	5.6	0	1.4	0	.6							
24	10	0	.8	0	0							
25	16	.1	.5	0	0							
26	18	.2	.4	0	0							
27	20	.3	.4	0	0							
28	17	.4	1.0	0	0							
29	9.5	—	.4	.1	0							
30	5.6	—	0	.5	0							
31	1.5	—	0	—	0	—		—		—		
Mean	23.0	.43	.90	.05	.38	0						
Runoff in Ac.Ft.	1410	24	55	3	23	0						
	Water Year Total ——								Calendar Year Total ——			

U. S. Geological Survey, U. S. Bureau of Reclamation and Division of Water Resources cooperative station located at Mile 168.0R at the head of Chamberlain Slough. Period of record 1939 to 1949. Records for 1949 computed by U. S. Geological Survey.

TABLE 106

FLOW OF SAN JOAQUIN RIVER AT FREMONT FORD BRIDGE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	62	127	154	235	197	195	98	69	90	45	28	42
2	62	118	160	219	214	212	92	64	89	41	28	41
3	82	114	160	207	219	192	92	64	87	38	30	39
4	132	111	164	206	219	183	93	61	94	36	30	38
5	134	111	232	200	212	183	87	61	100	35	28	37
6	132	111	434	186	200	173	80	63	104	35	28	37
7	128	113	537	159	204	165	80	61	106	35	31	42
8	131	113	559	138	206	156	83	60	106	36	35	44
9	187	115	478	141	204	141	83	62	99	34	36	46
10	207	187	369	152	229	129	81	69	100	31	40	50
11	217	221	313	138	240	128	79	63	107	28	42	47
12	245	209	299	135	242	125	76	60	110	28	38	46
13	244	187	311	152	231	128	74	62	108	28	39	42
14	222	204	422	154	224	125	75	66	106	27	38	41
15	207	200	450	148	251	115	72	67	110	29	40	42
16	195	187	412	146	260	110	69	71	104	29	56	38
17	183	167	352	144	301	114	67	70	102	27	53	41
18	171	153	303	165	374	124	70	66	94	21	54	47
19	170	136	273	178	407	128	67	63	100	21	58	58
20	173	127	269	197	448	147	62	63	92	21	56	63
21	165	124	315	200	455	154	66	63	90	21	54	62
22	164	121	446	202	475	154	62	68	90	29	52	60
23	159	113	458	194	450	158	67	64	83	28	49	61
24	158	108	431	183	396	162	66	67	72	24	46	62
25	156	107	460	187	356	165	60	69	71	23	45	60
26	159	111	472	199	325	154	59	69	79	21	46	61
27	160	124	436	204	254	142	58	78	70	21	46	63
28	162	132	371	200	204	128	57	79	60	20	45	61
29	159	—	327	202	184	114	60	76	54	21	44	60
30	146	—	273	197	189	106	64	79	49	25	44	61
31	141	—	253	—	191	—	66	86	—	27	—	62
Mean	162	141	351	179	276	147	73.1	67.2	90.9	28.5	42.0	50.1
Runoff in Ac.Ft.	9940	7840	21610	10650	16980	8750	4490	4130	5410	1760	2500	3080
	Water Year Total 106740								Calendar Year Total 97140			

U. S. Geological Survey, U. S. Bureau of Reclamation and Division of Water Resources cooperative station located at highway bridge on road between Gustine and Stevinson, Mile 129.5 above mouth of San Joaquin River and 5.7 miles above the confluence of the Merced River. Additional water during high flow periods passes this station via Mud Slough. There was no flow in Mud Slough for 1949. Drainage area is 8090 square miles. Period of record 1937 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 107

FLOW OF SAN JOAQUIN RIVER NEAR NEWMAN - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	230	335	350	960	346	1680	301	269	230	193	159	184
2	230	327	361	960	330	1300	294	240	230	196	150	184
3	237	320	361	955	392	1060	294	213	230	184	150	180
4	283	312	373	935	400	910	301	213	254	184	153	180
5	290	308	722	905	392	1080	290	230	269	177	156	187
6	283	308	828	712	361	1170	262	247	269	171	162	187
7	280	312	860	556	373	1130	294	294	280	174	168	196
8	280	303	1030	523	392	1420	237	265	283	180	171	200
9	323	339	1060	506	424	1490	233	244	298	196	174	200
10	361	396	985	489	444	1400	233	241	305	196	184	203
11	392	444	935	456	420	1350	254	265	305	187	187	203
12	436	428	945	400	420	1360	241	254	294	180	184	200
13	448	408	1170	373	396	1340	230	253	298	190	184	196
14	440	428	1240	369	400	1060	220	272	290	177	187	200
15	428	428	1190	350	464	720	206	294	283	177	184	193
16	408	416	1140	358	502	628	196	294	287	200	200	193
17	400	396	1060	342	535	573	206	287	290	184	203	196
18	388	330	995	377	594	514	213	272	294	150	209	203
19	392	369	960	388	654	518	240	251	298	141	213	209
20	388	361	985	377	748	535	233	226	287	141	213	220
21	384	354	1240	361	792	497	233	240	272	150	209	226
22	380	350	1240	373	810	460	226	269	254	156	206	226
23	377	339	1200	323	802	428	216	272	240	171	203	220
24	380	331	1180	312	761	388	216	272	233	168	193	220
25	377	323	1220	327	671	388	216	269	220	165	193	220
26	377	320	1240	350	594	384	216	237	237	165	193	220
27	380	327	1170	350	506	373	200	233	240	162	193	213
28	377	331	1100	350	436	346	190	233	220	153	193	209
29	369	—	1010	342	950	316	206	262	209	144	187	203
30	353	—	995	342	2120	305	233	251	200	147	184	203
31	346	—	985	—	2130	—	253	237	—	165	—	203
Mean	356	357	972	491	633	837	237	253	263	172	185	202
Runoff in Ac.Ft.	21860	19830	59760	29200	38890	49830	14560	15530	15670	10560	11000	12450
	Water Year Total 312200								Calendar Year Total 299190			

Station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. It is located at Hills Ferry bridge, Mile 123.7 above mouth of San Joaquin River and just below the mouth of the Merced River. Combine flow with Merced River Slough (Table 119) to give total flow passing this point. Drainage area is 9990 square miles. Period of record 1912 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 108

FLOW OF SAN JOAQUIN RIVER AT GRAYSON (LAIRD SLOUGH) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	340	407	387	1290	403	2210	360	280	330	335	247	318
2	327	400	415	1230	440	1830	370	257	330	390	260	320
3	312	390	438	1190	450	1490	380	225	355	425	260	318
4	312	382	455	1140	465	1250	420	215	385	390	262	310
5	343	380	520	1090	470	1130	427	218	410	380	275	295
6	360	377	730	980	450	1290	385	225	410	410	277	295
7	360	375	810	780	427	1340	330	285	400	405	278	312
8	360	377	870	610	425	1320	315	330	373	425	285	315
9	355	380	1010	590	487	1500	300	325	362	420	293	318
10	373	400	1050	590	470	1510	315	310	357	405	315	315
11	408	443	1020	580	487	1410	325	303	395	410	320	312
12	433	490	1030	540	453	1400	305	350	428	493	320	312
13	468	472	1120	470	445	1430	295	360	417	365	320	312
14	492	460	1270	420	485	1330	277	380	392	360	320	312
15	497	472	1270	410	600	1090	270	400	427	395	320	315
16	472	480	1200	350	720	830	258	413	425	455	325	305
17	452	465	1190	390	720	760	248	400	400	370	340	315
18	442	437	1140	420	695	705	257	385	428	315	342	320
19	448	423	1090	440	840	640	238	355	453	280	342	318
20	448	408	1070	405	1050	650	236	385	447	247	350	320
21	448	395	1150	410	1130	615	245	385	428	250	345	325
22	448	390	1350	405	1170	580	242	420	395	250	335	328
23	445	382	1390	410	1150	560	230	407	365	247	330	330
24	435	380	1460	390	1080	510	245	355	317	270	322	333
25	432	370	1510	415	960	530	252	395	328	277	320	335
26	435	370	1550	420	845	550	233	417	395	280	318	335
27	435	375	1560	415	780	530	210	422	347	277	315	333
28	440	380	1490	410	750	495	217	452	320	275	315	337
29	440	—	1420	390	710	427	240	440	323	250	318	333
30	430	—	1370	383	1400	390	265	360	350	245	320	333
31	415	—	1340	—	2170	—	280	325	—	240	—	330
Mean	413	409	1086	599	746	1010	290	348	383	340	310	320
Runoff in Ac.Ft.	25398	22731	66793	35629	45872	60103	17812	21380	22794	20898	18424	19654
	Water Year Total 389253								Calendar Year Total 377488			

Station is maintained jointly by City of San Francisco (Hetch Hetchy Water Supply), Division of Water Resources, Modesto Irrigation District and Turlock Irrigation District. Station is at Laird Slough Bridge, Mile 96.05 above mouth of San Joaquin River and 5 miles above the confluence of the Tuolumne River. High flows by-passing this station through old channel of San Joaquin River are included in this table. Period of record 1931 to date. Records for 1949 computed by the City of San Francisco.

TABLE 109

FLOW OF SAN JOAQUIN RIVER AT HETCH HETCHY AQUEDUCT CROSSING - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1700	980	880	3150	1170	2480	510	392	530	1050	1170	1450
2	1490	1060	990	2830	1230	2200	490	370	510	670	1250	1510
3	1080	1070	1150	2690	1250	1890	520	315	550	715	1400	1560
4	1030	1080	1320	2070	1320	1660	570	250	600	705	1390	1560
5	1270	1060	2620	1700	1200	1460	580	280	630	700	1410	1550
6	1320	1060	2230	1570	1160	1470	530	248	620	745	1410	1360
7	1340	1000	1970	1330	965	1560	480	332	610	770	1350	1420
8	1340	980	2130	1110	815	1620	440	440	562	840	1290	1370
9	1320	1310	1990	970	830	1760	410	460	560	815	1440	1370
10	1200	1320	1910	970	815	1860	420	423	562	800	1460	1350
11	1150	1280	2060	1160	815	1800	460	420	590	805	1530	1330
12	1400	1290	2340	1240	770	1750	450	440	620	930	1470	1310
13	1510	1280	2870	1600	815	1850	390	472	623	1020	1400	1320
14	1500	1220	2890	1160	1050	1790	370	510	592	1050	1380	1350
15	1520	1170	2580	1150	1370	1470	370	542	630	1240	1330	1350
16	1430	1230	2600	1300	1690	1160	373	540	643	1500	1420	1360
17	1320	1230	2610	1360	1720	980	350	530	640	1320	1460	1370
18	1150	1210	2630	1380	1480	910	352	500	640	1180	1460	1360
19	1340	1170	2570	1360	1580	860	352	526	710	1190	1470	1350
20	1400	1110	2570	1310	1750	870	360	542	670	1300	1450	1350
21	1440	1060	2630	1440	1710	830	380	580	650	1350	1390	1340
22	1410	970	2620	955	1540	730	390	680	620	1350	1340	1360
23	1420	1020	2880	955	1370	690	340	650	570	1310	1390	1360
24	1270	960	3210	985	1470	640	332	610	550	1220	1440	1350
25	1120	990	3500	1050	1240	630	362	610	572	1160	1410	1340
26	1410	990	3670	1070	1100	650	332	610	630	1300	1300	1380
27	1440	990	3740	1100	1320	650	290	622	610	1330	1310	1240
28	1430	990	3290	1030	2000	620	270	710	586	1330	1330	1210
29	1390	—	3000	980	2100	580	300	740	598	1320	1290	1310
30	1300	—	3160	1110	2170	550	330	620	620	1290	1400	1320
31	1110	—	3280	—	2490	—	383	560	—	1210	—	1310
Mean	1340	1110	2513	1403	1365	1266	403	501	603	1081	1385	1370
Runoff in Ac.Ft.	82413	61646	154493	83494	83911	75312	24766	30791	35897	66476	82393	84238
	Water Year Total 871910								Calendar Year Total 865830			

Station is maintained jointly by City of San Francisco (Hetch Hetchy Water Supply) and Division of Water Resources. Station is at Mile 82.65 above mouth of San Joaquin River and 2.9 miles above the confluence of the Stanislaus River. Period of record 1936 to date. Records for 1949 computed by the City of San Francisco.

TABLE 110

FLOW OF SAN JOAQUIN RIVER NEAR VERNALIS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1800	1400	1090	4190	3430	4290	694	544	614	770	1370	1620
2	1700	1430	1200	4130	3440	3560	654	437	589	845	1370	1700
3	1370	1480	1370	4000	3470	3140	674	467	642	900	1520	1780
4	1230	1540	1700	2920	3720	2710	734	420	726	900	1570	1820
5	1440	1500	3770	2380	3590	2400	762	388	766	850	1630	1730
6	1520	1520	3210	2540	3420	2300	710	382	754	915	1650	1540
7	1540	1470	2440	2260	3060	2130	690	456	730	935	1590	1600
8	1520	1390	2130	1830	2670	2020	622	523	642	1020	1510	1580
9	1520	1800	2230	1530	2580	2860	575	532	622	1010	1660	1660
10	1450	1820	2600	1660	2730	2900	589	517	646	990	1740	1620
11	1380	1650	2920	1860	2750	2940	626	535	706	1010	1820	1570
12	1700	1610	3340	1750	2710	2780	618	553	706	1080	1760	1540
13	1940	1550	4240	2010	2870	2880	566	582	706	1180	1640	1490
14	1870	1470	4300	1570	3450	2810	547	614	710	1240	1620	1520
15	1820	1400	3940	1540	4130	2330	511	638	742	1380	1510	1520
16	1760	1450	3940	1730	5020	1950	538	630	800	1710	1590	1590
17	1700	1450	3990	1800	5030	1670	508	626	770	1610	1640	1660
18	1500	1430	4000	1870	4360	1450	520	600	770	1320	1660	1630
19	1600	1380	3930	1770	4470	1380	511	582	830	1360	1680	1600
20	1950	1310	3910	1600	4770	1320	487	614	770	1440	1680	1530
21	2180	1260	3990	1340	4610	1260	502	674	754	1570	1590	1520
22	1950	1170	3590	1300	4030	1100	493	762	714	1600	1480	1550
23	2080	1210	4150	1240	3520	1030	484	734	682	1570	1540	1540
24	1900	1170	4570	1230	2710	940	517	690	638	1470	1580	1520
25	1640	1180	4730	1260	2180	870	535	714	714	1360	1620	1430
26	2030	1190	4810	1270	1920	870	502	710	770	1460	1480	1540
27	2190	1180	4750	1360	2520	875	442	706	734	1550	1510	1400
28	2170	1210	4110	1580	3850	850	408	785	722	1600	1530	1350
29	2080	—	3820	2620	4090	785	431	845	722	1590	1400	1470
30	1850	—	4250	3290	4020	775	464	714	746	1570	1510	1540
31	1580	—	4520	—	4250	—	526	638	—	1480	—	1490
Mean	1741	1415	3469	2058	3520	2002	563	602	715	1267	1582	1571
Runoff in Ac.Ft.	107000	78590	213300	122400	217000	119200	34590	37020	42520	7.920	94120	96600
	Water Year Total 1247070								Calendar Year Total 1240260			

This station is maintained jointly by the Division of Water Resources and the U. S. Geological Survey. It is located at Durham Ferry Bridge, 3 miles below the confluence of the Stanislaus River and is at Mile 76.7 above the mouth of the San Joaquin River. Drainage area is 14010 square miles. Period of record 1922 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 111

FLOW OF COTTONWOOD CREEK NEAR FRIANT - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			0	0.4	0							0
2			0	.3	0							0
3			0	.3	0							0
4			.1	.2	0							0
5			0	.1	0							0
6			0	.1	0							0
7			0	.1	0							0
8			0	.1	0							0
9			0	.1	0							0
10			.1	0	0							0
11			.1	0	0							0
12	N	N	.1	0	0	N	N	N	N	N	N	0
13	O	O	.1	0	0	O	O	O	O	O	O	0
14			.1	0	0							0
15			.1	0	0							0
16			.1	0	0							0
17	F	F	.1	0	.1	F	F	F	F	F	F	0
18	L	L	0	0	0	L	L	L	L	L	L	.2
19	O	O	0	0	0	O	O	O	O	O	O	.1
20	W	W	.3	0	0	W	W	W	W	W	W	0
21			1.2	0	0							0
22			1.3	0	0							0
23			3.0	0	0							0
24			1.9	0	0							0
25			1.1	0	0							0
26			.8	0	0							0
27			.8	0	0							0
28			.5	0	0							0
29		—	.5	0	0							0
30		—	.5	0	0							0
31		—	.5	—	0	—			—		—	0
Mean	0	0	0.43	.06	0.003	0	0	0	0	0	0	0.01
Runoff in Ac.Ft.	0	0	26	3.4	0.2	0	0	0	0	0	0	0.6
	Water Year Total 30								Calendar Year Total 30			

U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station located 1 mile above the mouth. Cottonwood Creek enters the San Joaquin River at Mile 269.53R. Drainage area is 38 square miles. Period of record 1941 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 112

FLOW OF LITTLE DRY CREEK NEAR FRIANT - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	.1	.1	2.8		0						
2	0	.1	.1	2.5		0						
3	0	.1	.1	2.2		0						
4	0	.1	22	1.9		0						
5	0	.1	8.5	1.6		0						
6	0	.1	3.8	1.5		0						
7	0	.1	3.8	1.5		0						
8	0	.1	4	1.3		0						
9	0	.1	2.8	1.2		0						
10	0	.1	2.5	1.1		0						
11	0	.1	7.9	.9		0						
12	0	.1	5.7	.6	N	0	N	N	N	N	N	N
13	0	.1	3.3	.6	0	0	0	0	0	0	0	0
14	0	.1	2.5	.5		0						
15	0	.1	2.2	.4		0						
16	0	.1	2.4	.4		0						
17	1.1	.1	2.4	.4	F	0	F	F	F	F	F	F
18	.1	.1	1.6	.3	L	0	L	L	L	L	L	L
19	.1	.1	2.8	.2	O	0	O	O	O	O	O	O
20	.1	.1	15	.1	W	0	W	W	W	W	W	W
21	.1	.1	5.7	.1		6.9						
22	.1	.1	4.9	.1		0						
23	.1	.1	30	0		0						
24	.1	.1	14	0		0						
25	.1	.1	8.2	0		0						
26	.1	.1	6.3	0		0						
27	.1	.1	5.2	0		0						
28	.1	.1	4.9	0		0						
29	.1	—	4.2	0		0						
30	.1	—	3.3	0		0						
31	.1	—	3.1	—		—			—		—	
Mean	.08	.10	5.91	.74	0	.23	0	0	0	0	0	0
Runoff in Ac.Ft.	5.0	5.6	364	44	0	14	0	0	0	0	0	0
	Water Year Total 433								Calendar Year Total 433			

U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station located 4 miles above the mouth. Little Dry Creek enters the San Joaquin River at Mile 264.0L. Drainage area is 58 square miles. Period of record 1937 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 113

FLOW OF FRESNO SLOUGH BY-PASS* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					0	0.6						
2					0	0						
3					0	0						
4					0	0						
5					0	0						
6					0	0						
7					0	0						
8					0	0						
9					0	0						
10					0	0						
11					0	0						
12	N	N	N	N	0	0	N	N	N	N	N	N
13	0	0	0	0	0	0	0	0	0	0	0	0
14					0	0						
15					0	0						
16					0	0						
17	F	F	F	F	0	0	F	F	F	F	F	F
18	L	L	L	L	0	0	L	L	L	L	L	L
19	0	0	0	0	0	0	0	0	0	0	0	0
20	W	W	W	W	0	0	W	W	W	W	W	W
21					0	0						
22					0	0						
23					0	0						
24					0	0						
25					0	0						
26					0	0						
27					0	0						
28					33	0						
29		—			86	0						
30		—			92	0						
31		—		—	13	—			—		—	
Mean	0	0	0	0	7.23	.02	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	0	0	444	1.2	0	0	0	0	0	0
	Water Year Total 445								Calendar Year Total 445			

U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station located a short distance below the station presently operated by the King's River Water Association. Station is located below Kerman-San Joaquin highway crossing on Fresno Slough By-Pass 5.8 miles above its confluence with Fresno Slough. Fresno Slough By-Pass enters Fresno Slough at Mile 11.8R above mouth of Fresno Slough. Period of record 1927 to 1932; 1935 to date. Records for 1949 computed by U. S. Geological Survey.
* Also known as James By-Pass and Fresno Slough Cut-off.

TABLE 114

FLOW OF BEAR CREEK ABOVE SAN JOAQUIN RIVER - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10	44	99	89	16	73	12	11	28	8	3	5
2	14	39	95	76	19	63	13	10	40	7	3	4
3	76	36	82	70	21	53	12	11	39	6	3	4
4	101	35	86	66	22	49	13	11	40	6	3	5
5	78	35	290	63	23	36	13	10	41	5	3	6
6	59	37	486	54	22	29	13	11	42	5	4	6
7	59	37	517	29	18	31	13	11	45	4	4	7
8	94	38	480	24	18	23	14	11	56	4	5	8
9	179	70	318	36	17	18	13	12	61	4	6	8
10	135	166	214	25	20	19	15	12	63	3	10	9
11	135	147	176	19	21	18	14	13	66	4	4	10
12	119	113	176	26	17	17	12	13	63	5	3	10
13	92	110	258	27	14	20	12	13	56	5	4	10
14	73	129	382	24	15	20	12	14	58	5	4	6
15	62	106	334	19	17	17	11	16	58	4	4	6
16	58	83	263	11	36	15	8	17	52	4	4	7
17	56	64	199	10	111	15	9	18	49	3	8	9
18	54	54	154	11	163	15	9	17	46	3	15	15
19	55	49	134	11	193	16	9	17	40	2	14	16
20	58	45	139	11	211	15	9	16	36	3	14	14
21	56	47	285	16	217	14	8	16	31	9	14	13
22	57	45	345	13	236	13	9	15	28	12	14	11
23	56	42	306	10	229	12	10	16	25	6	13	11
24	56	41	280	11	196	11	10	17	24	5	13	10
25	64	43	334	17	178	11	10	17	22	4	12	10
26	72	54	326	9	141	11	10	19	19	4	11	10
27	76	65	265	9	79	11	10	21	14	4	11	10
28	75	82	200	11	50	11	10	23	12	4	10	10
29	68	—	161	11	53	13	11	23	11	3	10	10
30	58	—	118	13	51	13	11	27	9	3	9	11
31	52	—	100	—	59	—	12	29	—	3	—	14
Mean	73	66	245	27	80	23	11	16	39	5	8	9
Runoff in Ac.Ft.	4477	3681	15079	1628	4925	1353	688	966	2329	292	466	565
	Water Year Total 37439								Calendar Year Total 36449			

U. S. Bureau of Reclamation station located about one mile above the mouth. Bear Creek is an east-side tributary to the San Joaquin River at Mile 140.5R. Period of record 1940 to date. Records for 1949 computed by U. S. Bureau of Reclamation.

TABLE 115

FLOW OF MERCED RIVER AT EXCHEQUER - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	38	36	36	607	1860	2280	1780	1750	1430	62	41	37
2	37	36	36	606	1850	2120	1810	1740	1390	62	41	38
3	37	38	47	608	1870	2410	1820	1740	1360	62	41	38
4	37	38	69	609	1920	2670	1820	1740	1360	62	41	38
5	37	38	62	593	1950	2640	1800	1720	1350	62	41	37
6	37	37	486	940	1930	2970	1810	1700	1320	62	41	37
7	37	37	529	1090	1970	3380	1780	1680	1310	62	41	37
8	37	36	529	1260	2010	3090	1770	1640	1320	62	41	37
9	37	36	529	1340	2010	3150	1770	1600	1310	62	41	37
10	37	36	525	1340	2010	3210	1790	1570	1290	62	41	38
11	37	37	532	1340	2010	3240	1830	1540	1300	62	41	38
12	37	37	541	1370	2030	2900	1850	1530	1330	62	41	38
13	37	37	539	1460	2030	2290	1860	1490	1350	62	41	36
14	37	37	537	1550	1990	2180	1890	1440	1360	62	41	34
15	37	36	539	1570	1890	2170	1930	1410	1440	49	41	35
16	37	36	535	1580	1740	2080	1950	1410	1460	38	41	37
17	37	36	536	1570	1680	2020	1970	1400	1460	38	41	38
18	37	36	534	1490	1620	1990	1930	1390	1460	38	41	38
19	37	36	534	1460	1550	1990	1920	1370	882	37	41	38
20	37	36	543	1450	1550	1970	1930	1370	861	37	41	38
21	37	36	542	1490	1550	1950	1970	1370	98	37	41	38
22	37	36	534	1570	1550	1950	1970	1380	61	37	41	38
23	37	36	535	1600	1550	1950	1930	1380	64	37	38	38
24	37	36	537	1640	1580	1920	1880	1390	66	40	38	38
25	37	36	535	1690	1630	1860	1870	1390	66	43	38	37
26	37	37	535	1730	1720	1840	1870	1390	64	44	37	36
27	37	37	540	1780	2220	1830	1880	1390	64	44	37	36
28	37	37	546	1810	4760	1800	1890	1390	64	41	37	36
29	37	—	558	1850	4370	1770	1880	1390	64	44	37	36
30	37	—	558	1850	3590	1750	1820	1400	64	41	37	36
31	36	—	578	—	2600	—	1770	1410	—	41	—	36
Mean	37.0	36.5	459	1361	2084	2312	1863	1500	901	50.1	40.0	37.1
Runoff in Ac.Ft.	2280	2030	28200	81010	128100	137600	114500	92250	53590	3080	2380	2280
	Water Year Total 646650								Calendar Year Total 647300			

U. S. Geological Survey and Merced Irrigation District cooperative station located 0.5 mile downstream from Lake McClure. Drainage area is 1035 square miles. Period of record 1922 to date. (Prior records available at a site 1 mile upstream.) Records for 1949 computed by U. S. Geological Survey.

TABLE 116

FLOW OF MERCED RIVER BELOW SNELLING (YOSEMITE VALLEY RAILROAD CROSSING) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.8	6.9	e13	701	20	960	15	28	9.3	5.0	5.8	9.6
2	8.8	6.9	e12	674	18	688	13	26	8.8	5.0	6.0	10
3	8.5	6.6	e16	694	15	688	14	25	8.5	5.0	6.9	11
4	8.0	7.1	196	538	13	1100	15	25	7.7	4.8	7.7	11
5	7.4	8.5	75	177	12	1010	13	20	8.0	4.4	6.2	12
6	7.1	8.2	142	80	12	1060	14	18	8.0	4.3	5.8	11
7	7.4	9.0	490	136	11	1840	15	19	7.7	4.3	6.4	12
8	7.1	10	511	129	15	1460	14	23	8.0	4.3	7.4	13
9	7.1	10	524	123	28	1390	14	16	8.5	4.1	8.8	14
10	7.4	9.6	545	85	27	1310	15	13	9.0	4.4	14	12
11	7.1	9.0	586	70	29	1370	14	12	9.6	4.6	14	11
12	6.6	8.5	681	57	32	1090	14	12	9.3	4.4	13	12
13	6.2	9.0	606	38	39	504	13	11	9.0	4.6	13	12
14	6.2	9.0	586	34	31	230	14	14	10	4.4	13	13
15	6.2	9.3	586	33	32	247	14	13	11	4.4	14	14
16	6.2	e9.6	586	31	34	185	15	11	13	4.6	14	14
17	5.8	e8.8	579	30	48	111	17	9.6	14	4.6	15	16
18	5.8	e6.9	579	30	45	87	19	8.8	14	4.4	15	19
19	6.2	e5.8	708	28	233	84	17	8.5	14	4.3	16	22
20	7.4	e5.8	708	30	166	64	18	8.0	10	4.4	13	20
21	7.7	e5.4	654	32	191	35	20	8.0	8.8	4.6	7.4	18
22	9.3	e5.4	640	42	326	31	22	8.2	7.4	4.4	6.0	17
23	11	e5.0	667	43	247	21	27	8.0	6.4	5.0	6.2	10
24	11	e5.8	654	36	185	20	26	7.7	5.6	4.4	6.9	8.0
25	10	e6.6	633	33	125	19	24	7.7	5.0	4.4	7.1	7.7
26	9.3	e6.9	620	25	69	16	26	7.7	5.0	4.4	7.7	7.7
27	8.0	e9.6	606	23	100	16	23	7.7	5.2	4.3	8.0	7.7
28	7.7	e9.6	620	22	3450	15	24	8.0	5.0	5.2	8.2	7.7
29	7.4	—	613	26	4220	15	26	8.0	5.0	5.6	9.0	7.7
30	6.9	—	626	26	3180	17	26	8.8	5.0	5.8	9.3	8.0
31	6.9	—	640	—	1630	—	21	9.0	—	5.8	—	8.8
Mean	7.6	7.8	506	134	470	523	18.1	13.2	8.5	4.6	9.7	12.2
Runoff in Ac.Ft.	469	434	31140	7985	28930	31110	1115	813	507	286	577	748
	Water Year Total 103836								Calendar Year Total 104114			

Division of Water Resources station located at Merced-Snelling highway bridge, Mile 42.1 above mouth. Period of record 1930 to date.

* Formerly listed as Merced River at Yosemite Valley Railroad Crossing. Railroad bridge was removed during 1948.

e Estimated.

TABLE 117

FLOW OF MERCED RIVER AT CRESSEY BRIDGE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	79	92	118	623	87	1070	66	74	70	57	e53	e67
2	79	91	116	647	80	800	65	77	72	55	e53	67
3	78	94	124	632	82	620	62	85	68	58	e54	68
4	77	92	688	632	80	856	60	86	67	58	e54	72
5	78	96	372	379	78	1010	55	82	64	56	e56	68
6	77	97	221	194	76	947	54	75	66	53	e57	67
7	77	102	488	222	74	1360	52	78	67	54	e59	68
8	79	147	563	174	66	1520	49	81	67	53	e62	73
9	79	133	590	168	65	1360	57	82	61	54	e64	73
10	78	116	605	158	73	1300	58	74	61	52	e65	73
11	78	109	617	143	65	1340	54	68	69	50	e66	73
12	79	108	951	127	67	1300	49	64	75	53	e67	74
13	78	117	902	120	75	936	45	67	74	50	367	73
14	79	112	694	112	87	377	42	70	69	50	e68	75
15	79	108	650	104	85	298	43	70	68	50	e68	78
16	79	104	638	102	93	258	50	72	72	50	e69	78
17	79	102	635	100	93	187	54	66	73	51	e69	79
18	79	99	629	99	99	150	57	66	81	47	e70	81
19	81	97	635	102	147	145	57	65	88	48	e70	85
20	88	97	1150	100	192	140	58	61	90	49	e70	88
21	88	97	777	99	174	110	59	65	80	47	e70	88
22	92	97	698	96	237	97	56	69	79	51	e69	84
23	103	96	671	96	280	93	54	64	72	52	e69	84
24	102	99	678	93	215	85	59	62	63	53	e68	79
25	105	102	662	85	171	80	60	62	59	53	e68	81
26	105	103	647	84	126	75	63	58	56	55	e68	81
27	99	110	617	82	107	72	64	60	59	55	e67	81
28	96	110	614	84	691	66	66	65	58	53	e68	82
29	94	—	617	81	2960	68	68	68	57	53	e68	81
30	94	—	614	86	2550	65	68	66	56	54	e67	80
31	93	—	608	—	1730	—	73	65	—	53	—	81
Mean	85.5	105	600	194	355	560	57.3	69.9	68.7	52.5	64.8	76.8
Runoff in Ac.Ft.	5258	5806	36870	11550	21830	33290	3525	4298	4088	3227	3854	4725
	Water Year Total 136979								Calendar Year Total 138321			

Division of Water Resources station located at Cressey Bridge, Mile 27.6 above mouth. Period of record 1941 to date.
e Estimated.

TABLE 118

FLOW OF MERCED RIVER NEAR STEVINSON* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	154	153	158	706	168	1470	182	178	138	144	123	135
2	153	153	162	725	175	1040	184	158	152	149	118	136
3	154	152	169	730	172	808	193	148	154	139	122	139
4	156	153	189	701	187	710	196	160	178	147	125	142
5	153	153	590	660	164	902	187	171	174	140	125	147
6	153	152	385	446	168	935	162	184	172	132	127	145
7	151	154	316	317	171	930	148	192	180	131	127	149
8	149	156	498	353	198	1360	135	200	181	140	130	149
9	148	196	556	324	220	1330	136	181	206	157	130	148
10	151	198	582	302	196	1250	148	180	208	152	132	148
11	151	182	592	279	167	1210	160	199	193	149	132	148
12	149	174	631	217	167	1260	152	193	190	144	134	147
13	149	169	888	190	168	1140	144	206	190	144	136	149
14	148	176	759	184	187	822	132	212	184	145	136	148
15	148	175	679	192	230	504	127	223	187	144	135	149
16	147	168	673	204	250	453	128	211	188	157	135	148
17	148	164	641	198	262	388	135	202	193	134	135	149
18	148	158	637	217	251	338	136	194	202	108	139	153
19	148	157	637	206	292	349	157	174	193	104	139	153
20	148	153	720	180	364	353	151	160	193	114	139	154
21	151	153	924	181	379	292	144	184	187	118	142	161
22	153	151	739	168	370	258	145	199	169	118	138	158
23	158	151	692	139	388	222	131	206	164	125	139	153
24	165	149	690	148	379	196	127	211	169	125	134	152
25	167	149	741	162	329	196	139	199	162	126	134	149
26	169	152	712	172	279	199	130	169	162	127	138	148
27	169	154	662	164	244	198	128	162	161	131	138	145
28	165	160	658	165	231	182	123	176	152	130	138	144
29	161	—	656	154	1280	171	143	199	147	126	136	142
30	157	—	699	160	2420	174	162	172	145	126	136	140
31	156	—	703	—	2120	—	181	154	—	127	—	139
Mean	154	161	592	298	406	655	150	186	176	134	133	147
Runoff in Ac.Ft.	9480	8960	36370	17740	24940	38960	9220	11420	10460	8240	7920	9060
	Water Year Total 194750								Calendar Year Total 192770			

U. S. Geological Survey, U. S. Bureau of Reclamation and Division of Water Resources cooperative station located at Mile 4.6R above mouth. Drainage area is 1274 square miles. Period of record 1944 to date. (Prior records available at a site 3.5 miles downstream.) Records for 1949 computed by U. S. Geological Survey.
* Also known as Merced River below Stevinson Drain.

TABLE 119

FLOW OF MERCED RIVER SLOUGH NEAR NEWMAN* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			0	0	0	75						
2			0	.1	0	24						
3			0	.2	0	3.9						
4			0	.2	0	.3						
5			0	.1	0	5.2						
6			0	0	0	8.8						
7			0	0	0	6.3						
8			0	0	0	47						
9			0	0	0	50						
10			0	0	0	40						
11			0	0	0	35						
12	N	N	0	0	0	39	N	N	N	N	N	N
13	0	0	2.8	0	0	31	0	0	0	0	0	0
14			1.5	0	0	4.6						
15			0	0	0	.2						
16			0	0	0	0						
17	F	F	0	0	0	0	F	F	F	F	F	F
18	L	L	0	0	0	0	L	L	L	L	L	L
19	O	O	0	0	0	0	O	O	O	O	O	O
20	W	W	0	0	0	0	W	W	W	W	W	W
21			9.4	0	0	0						
22			.7	0	0	0						
23			.1	0	0	0						
24			0	0	0	0						
25			.2	0	0	0						
26			.4	0	0	0						
27			0	0	0	0						
28			0	0	0	0						
29		—	0	0	40	0						
30		—	0	0	198	0						
31		—	0	—	167	—			—		—	
Mean	0	0	.49	.02	13.1	12.3	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	30	1	803	734	0	0	0	0	0	0
	Water Year Total 1568								Calendar Year Total 1568			

U. S. Geological Survey, U. S. Bureau of Reclamation and Division of Water Resources cooperative station located 500 feet downstream from the head of the slough between Merced River and San Joaquin River. This station records the flow which at high stages in the Merced River by-passes the Hills Ferry Road bridge and reaches the San Joaquin River at Mile 122.2 at a point below the Newman gaging station. Period of record 1941 to date. Records for 1949 computed by the U. S. Geological Survey.
* Also known as Merced River Slough near Hills Ferry Road Bridge.

TABLE 120

FLOW OF TUOLUMNE RIVER ABOVE LA GRANGE DAM - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	276	484	418	1510	4070	2260	2100	2160	1430	1360	866	1040
2	311	478	435	1750	4080	2260	2100	2100	1380	1000	852	1120
3	708	473	493	1660	3930	2260	2100	2090	1270	1460	859	911
4	697	570	396	2140	3590	2250	2100	2080	971	1480	841	639
5	675	335	258	2540	3390	2240	2100	2080	1080	1470	730	989
6	658	264	174	2510	3240	2250	2100	2060	1360	1460	515	972
7	627	496	398	2540	3230	2740	2100	1930	1410	1530	914	1050
8	485	481	425	2580	3230	3180	2100	2090	1430	1490	856	979
9	343	406	526	3430	3170	3380	2110	2130	1400	1040	981	933
10	704	498	964	4010	3220	3520	2110	2130	1320	1250	828	892
11	727	473	999	4050	3230	3900	2120	2150	989	1260	731	638
12	644	354	746	4080	3240	4160	2130	2150	1400	1210	674	1080
13	754	206	527	4140	3240	3770	2130	2150	1390	1190	512	1080
14	582	414	866	4470	3170	3490	2130	2090	1420	1020	847	1110
15	471	439	920	4500	3160	3310	2150	1940	1560	662	854	1130
16	307	415	977	4500	3200	3570	2140	1970	1550	532	833	1030
17	611	343	990	4460	3190	3750	2140	1990	1420	687	833	1050
18	589	352	946	4480	3200	3670	2160	1890	1300	764	817	657
19	692	248	943	4050	2510	3700	2190	1840	1670	894	690	1020
20	589	168	722	3940	1950	3340	2200	1740	1590	856	520	1110
21	598	334	1140	3930	1750	3190	2200	1440	1690	822	805	1010
22	433	267	1210	4050	1580	3190	2200	1950	1740	684	808	1060
23	271	383	1170	4050	1660	3190	2210	1940	1840	505	813	1000
24	585	355	1180	3960	1680	2540	2220	1880	1620	766	493	907
25	583	385	1160	4090	1650	2240	2240	1920	1380	782	752	536
26	527	330	1450	4100	1960	2260	2250	1930	1720	796	698	588
27	553	183	1410	4090	2260	2260	2270	1790	1740	756	528	1020
28	501	442	1510	4090	2270	2090	2270	1440	1720	730	805	976
29	395	—	1500	4090	2260	2100	2310	1940	1490	625	878	1040
30	215	—	1510	4090	2270	2100	2280	2000	1530	475	921	1080
31	463	—	1510	—	2260	—	2310	1960	—	721	—	1050
Mean	535	378	899	3596	2801	2939	2170	1966	1460	977	768	958
Runoff in Ac.Ft.	32870	20980	55290	214000	172200	174900	133400	120900	86900	60050	45730	58900
	Water Year Total 1176280								Calendar Year Total 1176120			

U. S. Geological Survey station located 0.5 mile downstream from Don Pedro Dam and 3.5 miles upstream from La Grange Dam. Drainage area is 1540 square miles. Period of record 1915 to date. (Prior records available at a site 3.5 miles downstream.) Records for 1949 computed by U. S. Geological Survey.

TABLE 121

FLOW OF TUOLUMNE RIVER AT LA GRANGE BRIDGE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	386	307	256	942	649	7.2	16	15	41	3.3	890	1070
2	199	307	277	260	670	7.2	16	14	41	3.7	887	1150
3	665	307	369	0	540	7.2	16	14	42	5.9	905	929
4	680	318	325	0	299	7.2	16	14	42	30	887	665
5	686	266	234	.6	208	7.2	16	14	39	80	752	942
6	675	191	58	0	27	7.2	16	14	30	149	597	728
7	623	281	231	0	9.3	7.9	16	27	21	247	890	752
8	545	260	185	0	7.9	11	15	14	16	357	890	680
9	361	284	240	103	8.6	12	15	13	11	487	1010	728
10	613	240	686	348	7.9	12	15	13	5.9	535	850	675
11	734	185	795	850	7.2	82	15	13	2.9	456	722	654
12	628	196	587	838	7.2	353	15	13	1.1	505	701	801
13	759	188	416	420	7.2	177	15	13	1.3	649	639	771
14	613	231	571	777	7.2	13	15	14	1.4	966	795	706
15	566	231	680	814	7.2	11	15	15	1.4	660	881	717
16	318	231	740	850	8.6	44	16	17	1.4	556	844	706
17	424	224	759	814	8.6	149	15	16	1.8	722	838	675
18	524	171	717	838	9.3	28	15	16	2.2	807	850	665
19	608	154	746	395	9.3	157	15	16	2.5	954	701	686
20	514	45	545	307	8.6	16	15	17	2.5	923	639	e701
21	510	131	838	263	7.9	15	15	17	2.5	874	765	e696
22	428	80	893	296	7.2	15	15	29	3.3	701	856	e680
23	171	141	881	403	6.6	15	14	32	3.3	561	844	e660
24	411	168	874	329	6.6	16	14	30	3.7	795	634	e746
25	505	134	862	478	6.6	16	14	28	3.7	807	686	e545
26	487	163	966	514	6.6	16	14	24	3.7	814	740	478
27	416	29	862	510	7.2	16	14	20	4.1	771	592	649
28	340	205	923	505	7.2	16	14	18	4.1	752	820	696
29	284	—	948	587	7.2	16	14	29	3.7	649	929	665
30	177	—	948	654	7.2	16	14	41	3.7	592	954	675
31	333	—	948	—	7.2	—	14	41	—	639	—	654
Mean	490	202	624	436	83.4	42.4	15.0	19.7	11.4	550	800	727
Runoff in Ac.Ft.	30120	11240	38400	25970	5127	2525	920	1212	681	33820	47580	44720
	Water Year Total 219405								Calendar Year Total 242315			

Station is maintained jointly by Division of Water Resources and Turlock Irrigation District. Station is at Mile 50.5 above mouth. Period of record 1937 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 122

FLOW OF TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	643	376	e404	1310	750	36	43	50	40	35	732	e1050
2	265	376	e399	1010	767	36	42	47	42	35	884	e1180
3	393	388	e518	141	750	35	42	49	35	34	895	915
4	714	393	e706	77	338	36	42	46	32	32	905	811
5	680	371	e441	61	399	37	42	46	26	31	829	767
6	673	274	e318	75	132	37	42	47	20	83	750	750
7	673	376	e195	66	68	37	44	50	29	40	666	732
8	620	393	e382	55	54	39	43	52	30	37	935	673
9	416	393	e382	46	50	39	42	55	34	36	1040	688
10	399	399	e864	606	50	42	42	52	36	112	e915	688
11	706	435	e1380	758	46	42	20	50	39	492	e855	673
12	697	422	e1260	1460	46	243	6	49	39	485	732	697
13	658	365	829	525	43	388	31	47	37	485	.714	750
14	658	410	723	829	43	118	39	47	37	e1030	598	697
15	576	422	966	997	44	61	37	47	37	e874	e915	750
16	376	472	1030	997	44	52	39	46	36	568	e976	697
17	302	472	1040	946	46	199	40	47	35	568	e976	680
18	620	416	1050	966	43	81	40	46	32	741	e986	680
19	590	376	1160	650	44	177	36	44	31	874	e767	666
20	666	226	956	388	46	83	34	43	31	986	e643	666
21	560	230	1040	333	50	52	39	44	34	956	e568	673
22	531	297	1380	365	50	46	43	40	34	837	e802	658
23	293	261	1350	472	47	43	43	44	35	666	e837	673
24	302	371	1320	399	46	43	44	49	36	628	e874	628
25	628	365	1350	531	43	46	43	44	37	829	e583	723
26	560	e318	1380	620	42	44	43	46	37	855	e758	466
27	472	e349	1220	613	43	43	43	46	36	846	e732	498
28	376	e188	1230	606	42	43	46	46	36	846	e560	650
29	371	—	1320	643	42	42	46	44	36	767	e811	643
30	284	—	1320	741	39	43	49	42	36	643	e905	658
31	284	—	1310	—	39	—	52	40	—	560	—	643
Mean	516	362	943	576	138	754	39.9	46.6	34.5	516	805	714
Runoff in Ac.Ft.	31710	20100	57960	34290	8501	4489	2454	2866	2053	31760	47890	43880
	Water Year Total 274943								Calendar Year Total 287953			

Station is maintained jointly by Division of Water Resources and Modesto Irrigation District. Station is at Mile 39.9 above mouth. Period of record 1930 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 123

FLOW OF TUOLUMNE RIVER AT HICKMAN-WATERFORD BRIDGE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	884	551	513	1490	768	103	106	123	128	108	671	1070
2	409	541	508	1380	763	101	108	120	133	106	843	1170
3	462	546	600	409	746	101	103	120	133	101	848	1130
4	797	551	724	218	413	106	101	123	123	94	860	987
5	774	504	536	150	440	103	98	120	126	92	843	803
6	757	435	431	147	222	106	94	123	120	150	740	920
7	757	440	316	150	155	106	92	120	118	106	590	780
8	692	527	485	131	123	103	96	120	133	89	890	774
9	565	513	485	126	116	106	94	123	133	87	896	714
10	499	522	791	556	110	106	94	118	133	89	944	e740
11	763	546	1110	639	106	103	94	113	136	495	837	e724
12	768	527	1040	1480	108	215	74	110	139	522	724	e837
13	735	476	866	600	108	418	78	110	136	531	703	e757
14	780	435	714	746	103	196	96	113	133	797	605	e780
15	703	513	962	962	103	118	98	116	136	968	808	e780
16	546	527	1040	994	101	96	98	118	136	610	860	e791
17	409	522	1080	981	101	203	103	123	136	527	837	e751
18	735	481	1040	968	101	175	101	123	139	660	860	e757
19	692	422	1050	808	106	212	101	118	139	786	843	e757
20	768	392	1010	467	103	172	96	120	136	854	751	e786
21	666	294	987	426	108	116	98	120	139	837	645	e791
22	666	413	1280	435	110	108	106	123	142	803	808	e791
23	476	355	1400	518	103	106	106	123	144	629	866	e791
24	392	476	1430	481	101	106	108	131	144	560	866	740
25	703	476	1460	560	101	108	106	131	136	763	634	837
26	645	440	1630	660	96	103	106	131	131	768	736	560
27	595	467	1500	655	96	103	113	133	118	791	774	575
28	531	316	1510	645	98	101	116	131	110	763	666	719
29	527	—	1520	671	101	103	116	131	108	735	896	714
30	462	—	1510	763	103	106	123	128	113	619	968	703
31	392	—	1500	—	108	—	123	128	—	560	—	719
Mean	631	472	1001	640	194	134	101	122	131	503	795	798
Runoff in Ac.Ft.	38780	26200	61540	38110	11940	7952	6240	7505	7797	30940	47330	49090
	Water Year Total 337864								Calendar Year Total 333424			

Station is maintained jointly by Division of Water Resources and Modesto Irrigation District. Station is at Mile 31.7 above mouth. Period of record 1932 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 124

FLOW OF TUOLUMNE RIVER AT MODESTO - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1700	619	625	1720	1040	298	266	242	236	249	910	1280
2	900	661	685	1650	1030	312	255	259	240	240	1130	1300
3	650	664	730	922	1030	312	300	247	244	236	1170	1370
4	720	655	1840	475	875	279	291	240	253	244	1180	1210
5	900	658	2360	307	694	288	277	242	228	240	1170	946
6	900	589	958	270	610	291	273	242	232	242	1070	1140
7	880	537	631	282	427	273	259	238	224	339	886	974
8	870	748	706	293	374	268	255	268	230	270	1130	974
9	820	910	706	257	344	270	264	251	232	257	1190	900
10	670	733	812	437	319	262	262	253	230	257	1280	906
11	720	715	1190	718	326	262	288	257	240	422	1130	889
12	900	703	1600	1380	291	317	249	253	240	685	982	868
13	914	661	2190	1170	319	583	218	244	240	718	930	962
14	934	575	1210	763	346	520	226	247	238	854	826	938
15	840	667	1130	1050	443	354	251	249	240	1230	974	978
16	796	685	1230	1160	405	302	255	259	247	1110	1080	982
17	598	688	1300	1200	344	282	244	244	234	799	1080	930
18	724	676	1320	1170	364	422	257	253	234	906	1080	926
19	836	604	1210	1200	419	344	251	259	238	1050	1070	906
20	889	563	1270	778	379	478	257	240	247	1200	950	918
21	830	454	1350	697	332	252	249	260	240	1200	836	942
22	840	543	1410	652	336	319	249	282	230	1160	950	934
23	748	517	1610	667	322	295	247	257	224	1020	1020	918
24	554	578	1610	763	305	275	253	279	226	850	1060	889
25	751	655	1860	718	305	275	262	253	230	1030	861	994
26	847	625	1930	854	291	284	255	232	228	1110	886	787
27	808	655	1920	850	288	259	249	238	234	1140	946	718
28	787	476	1860	840	288	255	259	270	234	1120	819	872
29	760	—	1850	861	291	253	251	255	247	1080	998	910
30	643	—	1800	954	334	253	255	234	249	962	1130	889
31	517	—	1780	—	286	—	242	244	—	872	—	892
Mean	814	636	1377	835	444	315	257	251	236	745	1024	969
Runoff in Ac.Ft.	50070	35330	84660	49700	27290	18720	15810	15450	14060	45800	60940	59590
	Water Year Total 465370								Calendar Year Total 477420			

Station is maintained jointly by Division of Water Resources, U. S. Geological Survey and Modesto Irrigation District. Station is located at the Tidewater Southern Railroad bridge at Mile 15.92 above the mouth of the Tuolumne River and 0.6 mile downstream from the confluence of Dry Creek. Period of record 1940 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 125

FLOW OF TUOLUMNE RIVER AT TUOLUMNE CITY - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1080	520	485	1800	940	375	350	330	335	320	790	1180
2	760	575	570	1720	970	400	350	320	340	320	1040	1370
3	535	590	600	1300	950	385	370	320	340	318	1180	1480
4	640	585	920	670	900	370	380	310	355	318	1200	1360
5	825	590	2260	515	655	370	360	315	345	318	1200	1140
6	820	575	1120	465	650	375	355	320	335	318	1130	1140
7	820	535	720	440	530	365	345	320	330	360	970	1110
8	800	580	625	450	485	365	330	335	325	363	1010	1060
9	750	840	675	425	475	350	340	335	325	325	1230	1000
10	610	700	700	450	435	350	345	330	325	320	1330	980
11	645	660	990	680	435	345	355	335	330	333	1270	980
12	820	640	1310	990	420	375	335	330	330	560	1130	950
13	800	620	1990	1200	425	460	310	340	325	640	1030	990
14	815	555	1410	790	440	525	300	330	330	700	960	1010
15	790	565	1080	980	480	445	320	340	330	1070	960	1020
16	720	600	1180	1120	475	395	330	340	330	1260	1010	1050
17	585	605	1220	1170	425	370	330	335	330	805	1200	1020
18	580	595	1290	1150	415	410	330	335	325	750	1180	990
19	720	570	1230	1150	450	425	330	345	320	950	1180	980
20	755	530	1250	900	455	455	325	340	320	1130	1090	980
21	740	495	1300	700	410	440	320	355	325	1200	990	990
22	720	475	1350	620	410	390	310	355	320	1180	940	990
23	670	505	1560	620	395	380	320	340	320	1080	1120	980
24	545	495	1660	700	375	365	330	365	310	860	1140	960
25	570	550	1820	700	370	365	330	370	320	890	1020	980
26	735	550	1900	770	365	370	330	350	315	1080	870	960
27	700	550	1950	830	365	355	330	345	320	1130	1000	770
28	680	515	1890	800	370	350	330	360	320	1130	920	830
29	670	—	1870	810	375	350	330	360	325	1090	950	960
30	600	—	1840	860	410	345	330	340	330	1010	1170	940
31	525	—	1820	—	390	—	335	335	—	860	—	950
Mean	710	577	1309	859	505	387	335	338	328	742	1074	1035
Runoff in Ac.Ft.	43686	32063	80499	51124	31031	23048	20598	20788	19498	45596	63888	63669
	Water Year Total 470465								Calendar Year Total 495488			

Station is maintained jointly by Division of Water Resources, City of San Francisco (Hetch Hetchy Water Supply), and Turlock Irrigation District. Station is at highway bridge, 3.35 miles above the mouth. Period of record 1930 to date. Records for 1949 computed by City of San Francisco.

TABLE 126

FLOW OF DRY CREEK NEAR MODESTO (CLAUSS ROAD BRIDGE) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	28	23	30	48	68	68	48	47	46	38	25	30
2	24	22	38	44	73	70	46	49	45	34	26	30
3	21	22	44	e43	85	68	46	44	46	32	26	31
4	20	21	1120	e42	80	67	46	40	40	34	27	31
5	19	21	e1130	44	74	74	45	40	36	35	28	32
6	18	21	e743	51	78	69	46	36	39	34	31	32
7	e17	28	e639	53	87	58	42	40	39	35	29	33
8	e17	e166	e578	56	80	57	e44	38	37	37	28	34
9	17	e200	e532	55	79	57	e44	42	38	38	27	33
10	18	e133	e477	58	74	51	e44	44	39	35	32	32
11	18	e86	e427	51	73	54	e44	43	41	36	37	32
12	19	e49	e374	55	72	58	e44	40	41	35	34	34
13	18	46	e318	61	74	61	e44	43	40	36	31	34
14	18	68	e270	55	98	53	e44	44	38	37	29	34
15	18	53	e221	54	86	53	e43	44	40	40	25	35
16	18	39	e179	65	78	50	41	53	43	39	24	36
17	18	35	e140	65	78	47	40	48	39	35	24	38
18	18	35	e115	66	88	52	39	45	37	33	25	39
19	19	32	e92	82	96	50	42	45	45	35	25	39
20	19	29	e79	72	96	57	42	46	51	35	26	39
21	19	28	e75	71	79	61	42	47	42	32	27	39
22	20	27	e75	76	68	60	42	45	38	29	28	39
23	23	26	e80	78	64	58	40	45	36	26	28	40
24	35	26	e92	78	64	54	41	43	42	24	26	40
25	82	26	e111	81	63	47	45	40	40	25	27	41
26	63	27	105	85	64	44	46	38	40	27	28	44
27	58	28	79	61	69	46	43	37	39	30	29	47
28	124	29	136	51	73	49	39	39	38	32	29	58
29	96	—	86	55	66	47	36	42	39	29	29	44
30	36	—	56	62	65	44	35	43	38	27	29	41
31	26	—	51	—	65	—	37	47	—	27	—	44
Mean	31.1	48.1	274	60.6	76.0	56.1	42.6	43.0	40.4	32.9	28.0	37.2
Runoff in Ac.Ft.	1912	2670	16840	3606	4675	3340	2618	2646	2404	2025	1666	2291
	Water Year Total 47621								Calendar Year Total 46693			

Station is maintained jointly by Division of Water Resources and Modesto Irrigation District. Station was moved to this location, 5.4 miles above Modesto, in 1941 from previous location at Mile 2.9. Dry Creek enters the Tuolumne River above the Modesto gaging station at Mile 16.5R. Period of record 1930 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 127

FLOW OF STANISLAUS RIVER BELOW MELONES POWERHOUSE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	71	599	499	1240	4060	2400	1050	978	794	3.4	93	125
2	23	756	509	135	4490	2310	1050	978	726	3.4	99	124
3	72	212	527	23	4500	2040	1040	978	297	84	126	4.6
4	125	778	523	1100	4190	2010	1050	970	300	92	128	4.6
5	101	323	24	1350	3960	2060	1060	970	307	98	5.0	120
6	79	20	24	1350	3370	2520	1060	970	311	96	5.0	403
7	77	665	657	1350	2990	2860	1050	970	307	94	120	255
8	71	604	1080	1560	3380	2990	1050	970	302	4.6	130	133
9	21	308	1430	1500	3650	3180	1040	970	302	4.6	127	132
10	563	143	1430	1400	3510	2850	1030	970	303	103	124	5.0
11	602	149	1430	1340	3680	2870	1030	950	12	105	124	4.6
12	236	76	1430	1560	4180	2840	1030	960	119	106	3.8	107
13	69	21	1430	1790	5260	2410	1030	960	112	106	3.8	112
14	321	254	1430	1810	8050	2280	1020	960	109	105	100	214
15	69	255	1420	1830	6330	2140	1020	960	89	4.6	108	159
16	19	218	1410	1880	4370	1980	1020	946	88	4.6	102	122
17	214	128	1400	1720	5170	1830	1020	950	3.4	96	110	4.2
18	500	327	1390	1540	5060	1730	1020	950	3.4	102	108	4.2
19	840	19	1390	1490	4500	1710	1010	950	102	102	4.6	118
20	321	19	229	1500	3940	1600	1010	950	96	96	4.6	221
21	710	329	1120	1510	2870	1480	1010	946	124	96	117	124
22	332	326	1380	1520	2540	1350	1010	962	128	5.5	126	215
23	19	323	1380	1540	1660	1260	1010	858	101	5.5	125	222
24	846	325	1370	1560	1660	1190	1010	826	3.1	101	125	3.4
25	777	444	1360	1580	2000	1080	1000	818	3.1	102	130	3.1
26	727	21	192	1590	5260	1080	994	818	100	108	2.8	216
27	637	228	23	3510	5330	1080	986	818	99	104	2.8	226
28	266	507	1080	4750	4780	1080	986	818	95	99	119	231
29	140	—	1350	4450	3850	1070	978	802	96	5.0	122	224
30	18	—	1340	4200	3500	1060	978	794	96	5.0	123	215
31	322	—	1040	—	2540	—	978	794	—	98	—	4.2
Mean	296	299	1010	1739	4048	1944	1020	920	184	69.0	87.3	132
Runoff in Ac.Ft.	18220	16610	62100	106500	248900	115700	62740	56560	10960	4240	5190	8100
	Water Year Total 717560								Calendar Year Total 715820			

U. S. Geological Survey station located 1 mile downstream from Melones Dam. Drainage area is 898 square miles. Period of record 1931 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 128

FLOW OF STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	102	94	e145	941	2680	545	21	20	30	107	65	152
2	105	224	154	568	3000	792	20	18	30	56	98	152
3	83	227	1920	125	3190	430	22	19	30	33	98	154
4	94	111	1180	466	2880	343	22	18	31	63	107	96
5	141	302	279	1140	2640	305	22	21	22	105	94	66
6	125	169	129	655	1900	681	30	22	17	105	120	107
7	109	458	111	279	1600	1240	28	24	12	102	54	357
8	107	371	458	195	1640	1440	24	24	18	107	92	267
9	105	202	981	946	2220	1400	24	26	17	56	118	171
10	289	134	1020	480	2140	1290	25	28	18	33	129	171
11	e548	90	1450	171	2140	1240	25	30	26	68	118	109
12	238	98	2340	94	2850	1190	22	26	17	107	122	77
13	187	81	1570	192	3760	824	17	26	15	107	58	118
14	116	65	1790	208	5810	609	16	25	43	109	40	164
15	276	50	1720	221	5970	518	18	27	72	113	24	282
16	118	45	1790	238	3320	367	25	21	58	60	100	244
17	92	45	1670	205	3600	232	22	24	58	36	116	200
18	279	39	1600	129	3660	164	21	25	38	74	118	122
19	698	39	1850	65	3360	122	18	27	15	102	87	96
20	455	39	961	58	2740	116	20	32	28	105	79	157
21	545	39	507	55	1360	55	20	28	94	102	72	102
22	418	38	1620	55	1250	42	25	27	107	102	75	70
23	384	39	1910	55	166	36	22	27	100	55	120	63
24	377	43	1690	65	116	32	18	24	94	32	127	68
25	843	49	1550	85	120	31	21	32	43	72	129	75
26	760	e141	698	262	2590	28	24	28	18	102	132	60
27	681	e152	195	1170	3950	27	22	30	55	100	79	113
28	388	e164	448	3380	3470	21	20	35	98	100	50	221
29	125	—	1450	3160	2500	22	21	32	98	102	98	134
30	74	—	1420	2880	1960	26	21	31	102	52	148	107
31	55	—	1410	—	1260	—	25	27	—	28	—	107
Mean	289	127	1162	618	2579	472	22	25.9	46.9	80.5	95.6	141
Runoff in Ac.Ft.	17750	7037	71460	36780	158600	28100	1351	1595	2795	4949	5687	8692
	Water Year Total 342282								Calendar Year Total 344796			

Station is maintained jointly by Division of Water Resources and Oakdale Irrigation District. Station is at highway bridge, Mile 44.7 above mouth or 5.7 miles above Oakdale. Period of record 1930 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 129

FLOW OF STANISLAUS RIVER AT RIVERBANK (BURNEYVILLE BRIDGE) - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	128	96	89	1140	2620	1060	89	73	71	154	92	157
2	126	268	131	1240	2640	1120	87	68	72	127	134	158
3	122	398	297	347	2990	900	84	63	77	94	154	158
4	102	168	2440	248	2860	789	84	69	67	86	178	143
5	156	411	680	1270	2630	731	84	76	61	132	174	86
6	162	242	216	1210	2310	845	81	69	60	156	160	68
7	147	206	125	869	1940	1280	79	71	55	152	144	233
8	140	611	273	577	1570	1530	77	73	53	164	112	284
9	130	415	857	981	2100	1400	77	73	75	142	160	228
10	122	167	1030	967	2170	1360	76	72	87	105	179	204
11	544	123	1280	513	2060	1500	73	69	85	94	145	175
12	717	96	2070	262	2390	1500	71	69	90	145	168	117
13	355	89	1530	255	3130	1220	68	68	90	160	162	161
14	167	84	1630	388	3890	991	66	72	75	169	90	158
15	335	78	1620	424	6480	900	64	70	91	162	79	275
16	171	73	1650	457	3640	778	66	74	91	138	81	311
17	126	71	1630	486	3360	603	69	70	85	102	143	277
18	186	69	1570	307	3520	455	71	66	81	91	160	216
19	537	65	1640	185	3410	333	71	68	72	138	158	135
20	913	64	1380	138	2970	262	65	68	68	153	118	102
21	474	65	663	102	2330	188	68	65	99	153	97	154
22	835	65	1530	98	1700	125	66	64	161	154	90	91
23	585	65	1770	98	938	105	70	68	182	131	106	72
24	255	65	1670	105	549	108	72	63	167	96	160	67
25	888	65	1570	118	481	102	72	63	125	92	181	62
26	888	85	1320	208	1350	99	75	67	94	142	174	60
27	829	86	426	567	3670	97	78	71	82	161	153	55
28	725	76	317	2580	3440	97	75	68	123	168	94	135
29	333	—	1250	3010	2870	95	78	65	143	171	76	138
30	135	—	1460	2790	2040	83	82	70	151	140	131	95
31	107	—	1480	—	1800	—	77	66	—	101	—	75
Mean	369	156	1148	731	2576	705	74.7	68.7	94.6	135	135	150
Runoff in Ac.Ft.	22690	8660	70600	43520	158400	41970	4592	4227	5629	8297	8039	9223
	Water Year Total 391676								Calendar Year Total 385847			

Station is maintained jointly by Division of Water Resources, Oakdale and South San Joaquin Irrigation Districts. Station is at Mile 32.0 above mouth. Period of record 1940 to date. Records for 1949 computed by Division of Water Resources.

TABLE 130

FLOW OF STANISLAUS RIVER AT RIPON - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	201	200	148	1320	1940	1660	196	154	160	212	145	206
2	196	208	169	1230	2470	1320	192	138	180	226	145	231
3	188	315	204	877	2690	1260	188	139	163	192	177	234
4	176	350	1540	510	2830	1060	206	135	157	179	198	238
5	168	258	1240	814	2670	961	198	135	152	166	217	195
6	209	380	579	1220	2490	908	193	145	140	200	211	157
7	216	283	359	954	2040	1160	193	148	133	216	216	172
8	198	435	296	647	1740	1470	172	164	135	224	179	382
9	188	484	546	584	1860	1590	195	158	145	206	188	370
10	180	376	939	973	2120	1660	187	158	142	177	238	285
11	260	262	1060	768	2070	1580	193	145	145	156	253	263
12	562	217	1470	510	2130	1570	185	152	151	157	226	209
13	470	201	1760	382	2610	1480	179	169	168	195	236	166
14	350	195	1480	427	3230	1200	198	162	164	203	196	172
15	255	182	1560	488	4110	1050	171	182	164	208	157	226
16	351	174	1550	506	5140	958	179	171	180	211	142	342
17	231	166	1600	508	3880	819	174	176	172	180	160	346
18	190	160	1540	468	3580	674	172	154	168	160	204	306
19	339	157	1520	366	3610	586	187	157	171	164	214	243
20	663	154	1680	299	3410	506	187	169	160	196	198	187
21	594	151	1070	312	2940	458	163	164	139	206	166	201
22	658	148	1030	339	2060	378	163	169	156	211	154	195
23	643	146	1530	342	1720	324	169	157	190	209	150	160
24	512	146	1650	350	906	292	168	187	200	180	192	145
25	565	146	1570	312	704	285	158	157	220	152	219	139
26	886	145	1500	299	734	251	152	171	180	158	226	142
27	886	166	933	412	2720	248	142	182	160	196	229	140
28	793	158	540	1220	3450	222	142	200	150	204	190	145
29	565	—	768	2530	3310	214	162	162	190	209	151	262
30	339	—	1370	2630	2610	203	151	151	206	211	158	221
31	240	—	1430	—	2240	—	156	160	—	174	—	185
Mean	396	227	1117	753	2581	878	176	160	165	192	191	221
Runoff in Ac.Ft.	24340	12620	68690	44820	158700	52260	10850	9860	9800	11780	11380	13620
	Water Year Total 432810								Calendar Year Total 428720			

Station maintained jointly by Division of Water Resources, U. S. Geological Survey, and Modesto Irrigation District. Station is at Highway 99 and is 16 miles above mouth of river. Period of record 1940 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 131

FLOW OF STANISLAUS RIVER NEAR MOUTH*- 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	160	248	341	1420	e2350	1860	145	160	99	180	180	206
2	154	225	150	1190	2290	1440	137	112	112	200	128	236
3	150	272	182	1150	2390	1410	134	111	162	196	134	248
4	150	357	1010	615	2600	1180	171	110	200	209	173	254
5	137	274	1520	606	2520	1060	178	120	182	180	223	248
6	152	354	757	1160	2380	971	150	110	176	206	230	211
7	171	316	462	981	2020	1080	155	126	147	178	230	189
8	167	291	345	724	1780	1370	131	150	100	208	234	e300
9	157	508	380	530	1740	1520	114	117	122	228	211	e338
10	155	438	745	837	1990	1470	164	137	135	196	240	e311
11	150	309	940	775	1980	1560	155	143	176	209	270	e283
12	318	252	1180	543	1960	1450	145	126	105	187	260	e268
13	473	209	1720	404	2130	1440	135	154	104	187	254	223
14	348	194	1470	341	2740	1200	140	159	164	198	250	198
15	258	180	1530	421	3290	1040	145	180	164	198	211	217
16	287	171	1510	410	3880	974	147	145	187	213	191	e272
17	254	160	1540	452	3610	863	139	142	160	198	184	e283
18	206	154	1520	431	3160	721	142	140	178	155	211	e285
19	219	152	1500	354	3210	637	137	120	126	167	232	e283
20	416	147	1570	260	3170	584	137	128	124	162	236	234
21	643	145	1370	228	2860	476	131	173	116	200	213	208
22	497	140	914	230	2260	397	117	134	110	213	198	226
23	668	140	1410	215	1900	350	131	112	129	193	185	196
24	540	139	1620	e213	1200	307	166	132	147	182	191	180
25	400	132	1580	e200	856	285	178	154	221	176	226	171
26	742	137	1520	e211	712	256	157	150	185	142	242	167
27	821	143	1160	e274	1840	228	117	145	162	178	248	162
28	796	157	703	e715	2940	200	99	167	175	196	244	160
29	676	—	606	e2470	2980	198	110	154	169	204	206	202
30	450	—	1180	e2700	2590	182	108	100	160	219	185	234
31	313	—	1440	—	2190	—	152	98	—	202	—	208
Mean	356	227	1093	705	2375	890	141	136	150	192	214	232
Runoff in Ac.Ft.	21370	12580	67190	41930	146000	52980	8662	8348	8920	11820	12730	14280
	Water Year Total 403010								Calendar Year Total 407310			

Division of Water Resources station located 4.3 miles above the mouth. Period of record 1946 to date. (Prior records available at other sites for 1930 to 1946.)
* Also known as Stanislaus River at Mile 4.3.
e Estimated.

TABLE 132

FLOW OF TULE RIVER NEAR PORTERVILLE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	35	40	70	99	185	90	6.7	0.2	0.3	0.1	1.8	23
2	41	40	72	93	195	85	3.9	.2	.2	.1	2.1	22
3	37	43	79	93	191	78	3.9	.2	.2	.1	2.1	23
4	33	42	83	99	168	72	3.9	.2	.2	.1	1.6	22
5	32	43	116	126	156	63	3.4	.2	.2	.1	1.8	21
6	33	43	87	119	158	55	2.6	.2	.2	.1	1.9	22
7	32	56	98	145	156	51	2.4	.2	.2	.1	1.9	22
8	34	58	120	149	147	47	2.1	.2	.2	.1	2.1	26
9	33	48	98	137	147	42	1.6	.2	.2	.1	6.7	27
10	32	47	89	177	132	40	1.5	.2	.2	.1	116	28
11	30	51	160	220	125	37	1.5	.2	.2	.1	63	26
12	33	60	130	245	128	35	1.3	.2	.2	.1	33	27
13	33	48	106	261	135	33	.9	.2	.1	.1	28	27
14	32	46	96	273	158	30	.8	.2	.1	.1	25	26
15	32	45	98	273	185	25	.8	.2	.1	.1	24	26
16	32	44	100	231	175	23	.8	.2	.1	.1	24	28
17	31	46	102	261	168	21	.8	.4	.1	.1	22	29
18	32	51	104	238	175	19	.6	.5	.1	.2	22	41
19	43	54	125	208	171	20	.6	.4	.1	.2	21	72
20	174	59	163	197	171	20	.5	.4	.1	.3	20	50
21	73	58	126	227	156	19	.5	.5	.1	.3	20	37
22	63	55	128	297	145	17	.6	.5	.1	.5	19	33
23	74	58	193	320	140	17	.5	.4	.1	.7	20	33
24	55	63	147	307	138	15	.4	.4	.1	.8	18	33
25	48	70	126	292	128	13	.2	.3	.1	1.0	18	32
26	46	65	117	258	125	12	.2	.3	.1	.8	20	32
27	44	83	114	222	122	9.7	.2	.3	.1	.9	22	32
28	43	76	122	229	116	8.8	.2	.3	.1	1.0	23	32
29	42	—	117	229	108	8.4	.2	.3	.1	1.2	20	31
30	41	—	106	199	102	7.9	.2	.3	.1	1.5	19	30
31	40	—	100	—	93	—	.2	.3	—	1.6	—	30
Mean	44.6	53.3	113	208	148	33.8	1.42	.28	.14	.41	20.6	30.4
Runoff in Ac.Ft.	2740	2960	6930	12400	9120	2010	87	17	9	25	1230	1870
	Water Year Total 38348								Calendar Year Total 39398			

U. S. Geological Survey and Division of Water Resources cooperative station located at highway bridge 1 mile upstream from the South Fork. Drainage area is 266 square miles. Period of record 1901 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 133

FLOW OF SOUTH FORK TULE RIVER NEAR SUCCESS - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.0	9.2	22	37	46	21	1.3				0	2.9
2	5.0	9.2	24	35	46	20	1.1				0	2.9
3	4.5	9.7	29	34	47	18	1.0				0	2.6
4	3.4	9.2	30	36	42	17	.9				0	2.6
5	3.2	9.2	34	43	40	16	.6				0	2.6
6	4.2	11	27	49	39	14	.4				.1	2.6
7	5.0	14	39	50	38	13	.4				.1	2.8
8	5.0	14	43	53	36	12	.3				.1	3.2
9	5.0	12	35	46	35	11	.2				.2	4.2
10	4.7	11	31	55	33	10	.2				27	4.7
11	4.0	14	69	61	31	8.8	.1				18	5.2
12	7.3	16	52	67	30	7.8	.1	N	N	N	8.8	3.8
13	8.8	11	40	69	30	6.8	0	0	0	0	6.0	3.2
14	8.3	10	36	72	34	5.6	0				5.2	3.6
15	8.3	11	36	72	43	5.0	0				5.0	3.8
16	8.3	11	38	67	42	4.2	0				4.5	4.5
17	7.8	11	38	70	40	4.2	0	F	F	F	3.8	5.2
18	6.4	13	38	64	41	4.5	0	L	L	L	3.4	11
19	7.2	14	49	58	39	5.2	0	0	0	0	3.2	16
20	30	15	56	56	39	5.0	0	W	W	W	3.2	11
21	16	15	44	63	35	4.5	0				3.2	6.4
22	14	15	51	75	33	4.0	0				3.2	6.4
23	17	18	84	76	33	3.6	0				3.2	6.4
24	12	20	57	75	31	3.4	0				3.1	6.4
25	11	25	49	71	27	3.4	0				3.1	6.0
26	10	22	48	64	26	3.2	0				3.1	6.0
27	10	29	46	58	23	3.4	0				3.1	6.0
28	9.7	24	52	58	23	2.4	0				2.9	6.0
29	9.7	—	47	56	23	1.6	0				2.9	6.0
30	9.7	—	42	48	23	1.5	0				2.9	6.4
31	9.7	—	39	—	22	—	0		—		—	5.6
Mean	8.68	14.4	42.7	57.9	34.5	8.0	0.21	0	0	0	3.98	5.35
Runoff in Ac.Ft.	534	798	2630	3450	2120	476	13	0	0	0	237	329
	Water Year Total 10301								Calendar Year Total 10587			

U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station located 5 miles upstream from the mouth. Drainage area is 106 square miles. Period of record 1930 to date. Records for 1949 computed by U. S. Geological Survey.

TABLE 134

FLOW OF TULE RIVER AT WORTH BRIDGE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34	46	78	131	222	88	5.3	e2.1			0	27
2	38	44	81	127	217	82	5.9	e2.1			0	22
3	38	48	92	125	212	73	5.0	e1.9			0	19
4	34	48	96	131	187	68	5.6	1.6			0	19
5	32	47	133	165	171	59	5.0	1.4			0	18
6	33	49	98	191	171	52	3.3	1.2			0	18
7	34	57	131	191	165	46	e3.3	1.2			0	18
8	35	64	147	200	158	40	e3.3	1.2			0	21
9	34	55	118	185	156	33	e3.3	.9			0	26
10	32	53	103	217	143	29	e3.3	.9			e46	26
11	29	55	200	257	133	21	e3.3	.9			69	26
12	31	70	169	285	129	16	e3.3	.7	N	N	38	26
13	32	59	133	293	138	17	e3.0	.5	0	0	31	26
14	31	55	120	314	158	14	e3.0	.5			28	28
15	30	54	120	320	205	13	e3.0	.2			27	27
16	30	53	122	273	200	9.7	e3.0	.2			26	29
17	30	54	124	308	191	8.2	e3.0	0	F	F	26	28
18	30	56	127	279	193	9.0	e3.0	0	L	L	25	38
19	36	60	151	239	187	12	e3.0	0	0	0	24	62
20	174	66	219	224	193	13	e3.0	0	W	W	25	63
21	81	64	169	257	171	13	e3.0	0			24	43
22	68	61	169	339	160	12	e3.0	0			24	38
23	81	64	285	370	152	11	e3.0	0			23	38
24	62	70	210	360	145	9.7	e3.0	0			20	38
25	55	82	174	343	131	7.9	e2.8	0			18	38
26	52	75	163	302	124	7.6	e2.8	0			21	38
27	50	97	158	265	120	7.9	e2.8	0			28	37
28	48	88	169	262	113	7.6	e2.8	0			28	37
29	48	—	165	260	108	6.8	e2.8	0			26	37
30	48	—	147	226	100	5.9	e2.8	0			26	35
31	48	—	142	—	94	—	e2.8	0	—		—	34
Mean	46.4	60.5	146	248	160	26.4	3.4	.6	0	0	20.1	31.6
Runoff in Ac.Ft.	2852	3360	8951	14760	9812	1572	209	35	0	0	1196	1944
	Water Year Total 43586								Calendar Year Total 44691			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located 1 mile above the head of Porter Slough and 2.2 miles downstream from the junction of South Fork. Period of record 1944 to date. Records for 1949 computed by Division of Water Resources.
e Estimated.

TABLE 135

FLOW OF TULE RIVER ABOVE LITTLE PIONEER DITCH - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			0	62	0							
2			0	55	0							
3			0	50	1.8							
4			0	45	8.5							
5			0	64	0							
6			0	100	0							
7			0	137	0							
8			0	143	0							
9			0	134	0							
10			0	105	0							
11			0	0	0							
12	N	N	0	0	0	N	N	N	N	N	N	N
13	0	0	9.9	32	0	0	0	0	0	0	0	0
14			0	26	0							
15			0	14	20							
16			0	7.6	13							
17	F	F	0	0	18	F	F	F	F	F	F	F
18	L	L	0	0	17	L	L	L	L	L	L	L
19	0	0	0	0	11	0	0	0	0	0	0	0
20	W	W	0	0	6.7	W	W	W	W	W	W	W
21			0	0	0							
22			0	0	0							
23			33	4.1	0							
24			100	70	0							
25			77	62	0							
26			70	46	0							
27			70	8.7	0							
28			70	0	0							
29		—	84	0	0							
30		—	70	0	0							
31		—	68	—	0	—			—		—	
Mean	0	0	21.0	38.8	3.1	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	1293	2312	190	0	0	0	0	0	0	0
	Water Year Total 3795								Calendar Year Total 3795			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located 0.8 mile upstream from Ottle Bridge and 14.4 miles downstream from junction of South Fork. Period of record 1942 to date. Records for 1949 computed by Division of Water Resources.

TABLE 136

FLOW OF TULE RIVER AT TURNBULL STATION - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13					NO FLOW DURING 1949							
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29		—										
30		—										
31		—		—		—			—		—	
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	0	0	0	0	0	0	0	0	0	0
	Water Year Total 0								Calendar Year Total 0			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located just above the Corcoran-Angiola Highway bridge, 39.0 miles downstream from the junction of South Fork. This station measures inflow to Tulare Lake area and at times the flows are a combination of direct Tule River water, Kaweah River water via Elk Bayou (See Table 137), and Kings River water via Homeland Canal, and waste water from Tulare Irrigation District. Period of record 1942 to date. Records for 1949 computed by Division of Water Resources.

TABLE 137

FLOW OF ELK BAYOU ABOVE ELK BAYOU AVENUE - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13					NO FLOW DURING 1949							
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29		—										
30		—										
31		—		—		—			—		—	
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	0	0	0	0	0	0	0	0	0	0
	Water Year Total 0								Calendar Year Total 0			

U. S. Bureau of Reclamation station located 1 mile east of Elk Bayou Avenue and 3.6 miles downstream from Highway 99. The flows passing this station, mainly of Kaweah River origin, can enter Tule River above the Turnbull gaging station. At times Tule River water enters Elk Bayou above this station via Porter Slough. Period of record 1942 to date. Records for 1949 computed by U. S. Bureau of Reclamation.

TABLE 138

FLOW OF SOUTH FORK KINGS RIVER BELOW EMPIRE WEIR #2 - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					0							
2					0							
3					0							
4					0							
5					0							
6					0							
7					0							
8					0							
9					0							
10					0							
11					0							
12	N	N	N	N	0	N	N	N	N	N	N	N
13	0	0	0	0	0	0	0	0	0	0	0	0
14					0							
15					0							
16					0							
17	F	F	F	F	0	F	F	F	F	F	F	F
18	L	L	L	L	0	L	L	L	L	L	L	L
19	0	0	0	0	0	0	0	0	0	0	0	0
20	W	W	W	W	0	W	W	W	W	W	W	W
21					0							
22					0							
23					0							
24					0							
25					0							
26					0							
27					0							
28					43							
29		—			17							
30		—			10							
31		—		—	10	—			—		—	
Mean	0	0	0	0	2.6	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	0	0	159	0	0	0	0	0	0	0
	Water Year Total 159								Calendar Year Total 159			

Kings River Water Association station located 1 mile southwest of Stratford. This station measures inflow of Kings River water to the Tulare Lake area. Period of record 1937 to date. Records for 1949 computed by Kings River Water Association.

TABLE 139

FLOW OF CROSS CREEK BELOW LAKELAND CANAL #2 - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1 2 3 4 5												
6 7 8 9 10												
11 12 13 14 15	NO FLOW DURING 1949											
16 17 18 19 20												
21 22 23 24 25												
26 27 28 29 30 31		— — —		—		—			—		—	
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	0	0	0	0	0	0	0	0	0	0
	Water Year Total 0								Calendar Year Total 0			

Corcoran Irrigation District station located below the Cross Creek weir, 4 miles east of Guernsey. This station measures inflow to Tulare Lake area and at times the flows are a combination of Kaweah River water, Kings River water, and Cottonwood Creek water. Period of record 1921 to date. Records for 1949 computed by Corcoran Irrigation District.

TABLE 140

FLOW OF WEST-SIDE CANAL NEAR LOST HILLS* - 1949

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1 2 3 4 5												
6 7 8 9 10												
11 12 13 14 15	NO FLOW DURING 1949											
16 17 18 19 20												
21 22 23 24 25												
26 27 28 29 30 31		— — —		—		—			—		—	
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac.Ft.	0	0	0	0	0	0	0	0	0	0	0	0
	Water Year Total 0								Calendar Year Total 0			

Division of Water Resources and U. S. Bureau of Reclamation cooperative station located at bridge on State Highway between Wasco and Lost Hills. This station measures inflow of Kern River water to the Tulare Lake area. Period of record 1944 to date. Records for 1949 computed by Division of Water Resources.

* Also known as Main Drain at Hart's Station.

TABLE 141

SUMMARY OF WATER UTILIZATION OF SACRAMENTO-SAN JOAQUIN VALLEYS

	Year	Acreage			Diversion Acre-Feet	Irrigation Draft Average c.f.s. July	Gross Duty of Water (1)		Runoff in % of Normal Sacto. R. at Red Bluff
		General	Rice	Total			Ac. Ft. per Acre	Acres per Sec. Ft.	
Sacramento River Redding to Sacramento	1939	158800	63850	222700	1301000	3746	5.74	85	50
	1940	119700	64390	184100	1063000	4050	5.65	86	120
	1941	118600	85200	203800	1150000	4314	5.53	88	164
	1942	111200	107700	218900	1279000	4662	5.74	85	129
	1943	107400	115600	223000	1417000	4699	6.24	78	97
	1944	111900	122200	234100	1678000	5502	7.06	69	53
	1945	106500	115100	221600	1676000	5766	7.44	65	76
	1946	117500	124100	241700	1778000	5560	7.24	67	92
	1947	121600	124000	245600	1707000	5600	6.82	71	58
	1948	149700	124800	273800	1593000	5947	5.71	85	87
	Av. 1939 to 1948	122300	104700	226900	1464000	4985	6.32	78	93
	1949	143500	137300	280800	1873000	6344	6.55	73	69
									Sacto. R. at Red Bluff
Back Borrow Pit Knights Landing Outfall Gates to Highway 20 Bridge	1939	1710	5770	7480	42620	139	5.70	85	50
	1940	3130	3260	6390	20640	89	3.23	150	120
	1941	3890	1970	5860	19550	103	3.34	146	164
	1942	2760	5650	8410	37790	179	4.49	108	129
	1943	2810	11680	14490	74550	279	5.15	94	97
	1944	960	9020	9980	65760	240	6.59	74	53
	1945	1580	5180	6760	38520	161	5.70	85	76
	1946	2060	7880	9940	70920	256	7.13	68	92
	1947	2300	9040	11340	73940	254	6.52	75	58
	1948	2460	7080	9540	82500	332	8.65	56	87
	Av. 1939 to 1948	2600	7310	9920	57660	222	5.65	94	93
	1949	1270	9000	10280	69500	230	6.76	72	69
									Sacto. R. at Red Bluff
Colusa Trough above Highway 20 Bridge	1939	40	1060	1100	32240	109	29.31	17	50
	1940	220	700	920	39430	136	43.78	11	120
	1941	270	1280	1550	30300	106	19.55	25	164
	1942	270	1520	1790	28260	104	15.79	31	129
	1943	600	2770	3370	40730	160	12.09	40	97
	1944	1540	4490	6030	53710	198	8.91	55	53
	1945	200	3880	4080	48490	171	11.88	41	76
	1946	3030	3690	6720	71220	256	10.60	46	92
	1947	1040	6570	7610	80480	281	10.58	46	58
	1948	3250	4740	7990	67470	275	8.44	58	87
	Av. 1939 to 1948	1050	3070	4120	(2)49200	180	(2)17.09	(2)37	93
	1949	3140	5560	8700	(2)90200	310	(2)10.37	(2)47	69
									Sacto R. at Red Bluff
Yolo By-Pass and Knights Landing Ridge Cut	1939	1990	2630	4620	31960	112	6.92	70	50
	1940	2500		2500	3840	32	1.54	316	120
	1941	1840	890	2730	9860	44	3.61	135	164
	1942	1730	880	2610	12370	52	4.74	103	129
	1943	1860	1410	3270	18670	84	5.72	85	97
	1944	1540	4230	5770	33360	126	5.78	84	53
	1945	1820	3820	5640	35800	141	6.35	77	76
	1946	1790	3000	4790	30260	112	6.32	77	92
	1947	3220	2980	6200	27180	110	4.38	111	58
	1948	1710	2260	3990	27800	93	7.00	69	87
	Av. 1939 to 1948	2000	2210	4210	23100	91	5.24	113	93
	1949	1740	2150	3890	34500	40	8.87	55	69
									Feather R. near Oroville
Lower Butte Creek and Butte Slough	1939	12260	610	12870	36312	91	2.82	172	39
	1940	9650	410	10060	28120	74	2.80	174	116
	1941	9620		9620	27020	40	2.81	173	133
	1942	8720	1050	9770	31880	65	3.26	149	136
	1943	8730	2020	10700	35890	77	3.35	145	115
	1944	7750	1760	9600	33670	60	3.51	139	57
	1945	7820	2110	9900	39580	88	4.00	122	77
	1946	8250	1850	10000	45670	123	4.56	107	85
	1947	4520	1120	5600	19800	58	3.54	137	52
	1948	4650	660	5310	27620	106	5.20	93	80
	Av. 1939 to 1948	8200	1160	9340	32500	78	3.58	141	89
	1949	7140	1870	9010	65200	205	7.24	67	53

(1) Excluding Municipal diversions on Sacramento River, the City of Sacramento and the City of Redding.
(2) Includes an indeterminant amount of water used by cooperative plants and is not very indicative of use.

TABLE 141 (CONT'D)

SUMMARY OF WATER UTILIZATION OF SACRAMENTO-SAN JOAQUIN VALLEYS

	Year	Acreage			Diversion Acre-Feet	Irrigation Draft Average c.f.s. July	Gross Duty of Water (1)		Runoff in % of Normal Feather R. near Oroville
		General	Rice	Total			Ac. Ft. per Acre	Acres per Sec. Ft.	
East and West Borrow Pits of Sutter By-Pass and Sacramento Slough	1939	7660	1640	9300	32600	108	3.51	139	39
	1940	8090	650	8740	24260	118	2.78	178	116
	1941	7830	2440	10270	31260	141	3.04	160	133
	1942	5550	1790	7340	22680	88	3.09	157	136
	1943	5380	3040	8420	33140	133	3.94	123	115
	1944	5890	4300	10190	51100	195	5.01	97	57
	1945	4710	7000	11710	54720	199	4.67	104	77
	1946	9380	4920	14300	59160	217	4.14	117	85
	1947	8840	3210	12050	48440	180	4.02	121	52
	1948	7920	2640	10560	36240	149	3.43	142	80
	Av. 1939 to 1948	7120	3160	10290	39360	153	3.76	134	89
	1949	8300	6180	14500	77600	252	5.35	91	53
									Feather R. near Oroville
Feather River Mouth to Oroville Bridge	1939	29230	26300	55530	501400	1497	9.03	54	39
	1940	30120	23530	53650	474000	1713	8.84	55	116
	1941	27660	26640	54300	475200	1681	8.75	56	133
	1942	38480	25180	63660	539700	2042	8.48	57	136
	1943	24090	46570	70660	623600	2134	8.82	55	115
	1944	25240	49840	75080	712900	2312	9.50	51	57
	1945	25110	47860	72970	698400	2313	9.57	51	77
	1946	27190	51080	78270	744800	2362	9.52	51	85
	1947	28260	49750	78010	674400	2245	8.65	56	52
	1948	29530	43260	72790	586300	2292	8.05	60	80
	Av. 1939 to 1948	28490	39060	67490	603100	2059	8.92	55	89
	1949	31000	51100	82200	716300	2241	8.71	56	53
									Yuba R. at Smartville
Yuba River	1939	6640	1900	8540	73110	210	8.56	57	36
	1940	7220	1270	8490	69970	247	8.24	59	115
	1941	7470	1350	8820	73530	221	8.34	58	129
	1942	6660	1120	7780	74710	243	9.60	51	137
	1943	6280	2310	8590	93800	280	10.92	45	126
	1944	7010	2400	9410	93260	273	9.91	49	56
	1945	8820	1050	9900	84230	229	8.51	57	88
	1946	8870	1960	10830	98690	278	9.11	53	96
	1947	8280	3630	11910	100100	282	8.40	58	55
	1948	8720	3120	11840	92760	281	7.75	62	81
	Av. 1939 to 1948	7560	2010	9610	85420	254	8.93	55	92
	1949	8840	3300	12140	106800	316	8.80	55	60
									American R. at Fairoaks
American River Mouth to Fairoaks	1939	3060		3060	6650	28	2.17	151	36
	1940	3060		3060	6050	29	1.98	215	118
	1941	3050		3050	5310	25	1.74	277	109
	1942	3130		3130	4170	23	1.33	374	136
	1943	3110		3110	4580	25	1.47	258	135
	1944	3200		3200	4820	25	1.51	304	51
	1945	2940		2940	3860	16	1.31	373	88
	1946	2890		2890	4120	18	1.43	275	100
	1947	3670		3670	5910	19	1.61	290	49
	1948	3630		3630	5880	28	1.62	253	78
	Av. 1939 to 1948	3170		3170	5140	24	1.62	277	90
	1949	3860		3860	5510	24	1.43	187	64
									Sacto R. at Red Bluff
Sacramento River System Sacramento River and Tributaries	1939	221400	103800	325200	2058000	6040	6.33	75	50
	1940	183700	94200	277900	1729000	6488	6.14	79	120
	1941	180200	119800	300000	1822000	6675	6.07	81	164
	1942	178500	144900	323400	2031000	7458	6.28	78	129
	1943	160300	185400	345700	2342000	7871	6.77	72	97
	1944	165000	198200	363200	2726000	8931	7.51	65	53
	1945	159500	186000	345500	2680000	9084	7.76	63	76
	1946	181100	198500	379600	2903000	9182	7.65	64	92
	1947	181700	200300	382000	2737000	9029	7.08	69	58
	1948	211600	187900	399500	2520000	9503	6.31	78	87
	Av. 1939 to 1948	182300	161900	344200	2355000	8026	6.79	72	93
	1949	208800	216500	425300	3039000	9962	7.16	68	69

(1) Excluding Municipal diversions on Sacramento River, the City of Sacramento and the City of Redding.

TABLE 141 (CONT'D)

SUMMARY OF WATER UTILIZATION OF SACRAMENTO-SAN JOAQUIN VALLEYS

	Year	Acreage			Diversion Acre-Feet	Irrigation Draft Average c.f.s. July	Gross Duty of Water		Runoff in % of Normal San Joaquin R. near Vernalis
		General	Rice	Total			Ac. Ft. per Acre	Acres per Sec. Ft.	
Old San Joaquin River and Tom Paine Slough	1939	38870		38870	81530	242	2.10	232	46
	1940	33020		33020	64640	264	1.96	248	105
	1941	32810		32810	60430	248	1.84	264	127
	1942	33110		33110	61900	254	1.87	260	118
	1943	45660	150	45810	76150	267	1.66	292	117
	1944	47000	240	47240	105700	325	2.24	217	62
	1945	37300	220	37520	106400	369	2.84	171	106
	1946	40000	320	40320	126100	374	3.13	155	92
	1947	43140	550	43690	136800	423	3.13	155	55
	1948	45380	470	45850	135600	427	2.96	164	68
	Av. 1939 to 1948	39630	350	39980	99520	319	2.49	194	90
	1949	51310	380	51690	157700	480	3.05	159	61
									San Joaquin R. near Vernalis
San Joaquin River Stockton to Vernalis	1939	18670		18670	51210	191	2.74	177	46
	1940	18460		18460	44640	208	2.42	201	105
	1941	19300		19300	40080	195	2.08	234	127
	1942	17930		17930	42180	198	2.35	206	118
	1943	19500		19500	51720	189	2.65	183	117
	1944	20730		20730	59310	185	2.86	170	62
	1945	19940		19940	62330	213	3.12	155	106
	1946	24500		24500	77150	250	3.15	154	92
	1947	25120		25120	84480	251	3.36	144	55
	1948	25550		25550	66600	226	2.61	186	68
	Av. 1939 to 1948	20970		20970	57970	211	2.73	181	90
	1949	26900		26900	78600	243	2.92	166	61
									San Joaquin R. near Vernalis
San Joaquin River Vernalis to Fremont Ford	1939	42380	420	42800	120000	409	2.80	173	46
	1940	39370	470	39840	97810	429	2.45	198	105
	1941	39870	480	40350	93420	431	2.32	210	127
	1942	41930	580	42510	104400	461	2.46	198	118
	1943	41140	340	41480	121700	486	2.93	166	117
	1944	42190	1460	43650	138300	440	3.17	153	62
	1945	41600	850	42450	131400	495	3.10	157	106
	1946	43090	1400	44490	160000	520	3.60	135	92
	1947	43080	1360	44440	181400	554	4.08	119	55
	1948	46380	540	46920	144800	471	3.09	157	68
	Av. 1939 to 1948	42100	790	42890	129300	470	3.00	167	90
	1949	45780	620	46400	166800	551	3.59	135	61
									San Joaquin R. near Vernalis
San Joaquin River Fremont Ford to Friant Dam Including Fresno Slough and Fresno Slough By-Pass	1946	285000	11600	296600	991800	2485	3.34	145	92
	1947	313600	13260	326900	843300	2292	2.58	188	55
	1948	305600	10250	315900	833200	2660	2.64	184	92
	Av. 1946 to 1948	301400	11700	313100	889400	2479	2.85	172	80
	1949	311400	18720	330100	953700	2276	2.89	168	61
									Merced R. at Exchequer
Merced River Mouth to Yosemite Valley Railroad Crossing	1939	3480		3480	10310	41	2.96	164	45
	1940	3120		3120	9110	36	2.92	166	103
	1941	3570		3570	7590	32	2.13	229	136
	1942	3300		3300	8400	44	2.55	191	120
	1943	3680		3680	11720	50	3.18	153	121
	1944	4510		4510	13500	42	2.99	162	64
	1945	4400		4400	11820	50	2.69	181	103
	1946	4480		4480	14400	59	3.21	151	88
	1947	5910		5910	21080	71	3.57	136	53
	1948	6490		6490	17760	80	2.74	178	64
	Av. 1939 to 1948	4290		4290	12570	50	2.89	171	90
	1949	7940		7940	25640	92	3.23	150	59

TABLE 141 (CONT'D)

SUMMARY OF WATER UTILIZATION OF SACRAMENTO-SAN JOAQUIN VALLEYS

	Year	Acreage			Diversion Acre-Feet	Irrigation Draft Average c.f.s. July	Gross Duty of Water (1)		Runoff in % of Normal
		General	Rice	Total			Ac. Ft. per Acre	Acres per Sec. Ft.	Tuolumne R. near La Grange
	1939	860		860	2530	7	2.94	165	46
	1940	1070		1070	2580	10	2.41	202	112
Tuolumne River	1941	1300		1300	3150	10	2.42	201	126
	1942	1620		1620	2770	10	1.71	284	120
Mouth	1943	1830		1830	2620	9	1.43	339	120
	1944	3160		3160	4100	13	1.30	375	66
Roberts Ferry Bridge	1945	3260		3260	3560	12	1.09	445	106
	1946	3560		3560	4920	15	1.38	352	95
	1947	3760		3760	7470	20	1.99	245	55
	1948	3750		3750	6230	21	1.66	293	71
	Av. 1939 to 1948	2420		2420	3990	13	1.83	290	92
	1949	4400		4400	6440	18	1.46	332	63
									Stanislaus R. below Melones
	1939	6330		6330	16230	52	2.56	190	41
	1940	6900		6900	15750	63	2.28	213	110
Stanislaus River	1941	6940	110	7050	16660	56	2.37	206	105
	1942	7100	130	7230	20010	75	2.77	176	117
Mouth	1943	7360		7360	22060	73	3.00	162	123
	1944	7920		7920	21830	69	2.76	176	53
to	1945	6870		6870	21660	72	3.15	154	100
	1946	6340		6340	26810	82	4.23	115	93
Orange Blossom Bridge	1947	6600		6600	30080	88	4.56	107	51
	1948	7920		7920	29700	99	3.75	130	70
	Av. 1939 to 1948	7030	24	7050	22080	73	3.14	163	86
	1949	8550		8550	23160	76	2.71	179	58
									San Joaquin at Vernalis
San Joaquin River System									
San Joaquin River	1939	110600	420	111000	281800	942	2.54	191	46
Stockton-Fremont Ford	1940	101900	470	102400	234500	1010	2.29	212	105
	1941	103800	590	104400	221300	972	2.12	229	127
and Tributaries	1942	105000	710	105700	239700	1042	2.27	214	118
	1943	119200	490	119700	286000	1074	2.39	203	117
Including Old San Joaquin	1944	125500	1700	127200	342700	1074	2.69	180	62
	1945	113400	1070	114500	337200	1211	2.94	165	106
and	1946	122000	1720	123700	409400	1300	3.31	147	92
	1947	127600	1910	129500	461300	1407	3.56	136	55
Tom Paine Slough	1948	135500	1010	136500	400700	1324	2.94	166	92
	Av. 1939 to 1948	116400	1010	117500	321500	1136	2.70	184	80
	1949	144900	1000	145900	458300	1460	3.14	155	61
Combined above Delta									
Sacramento River	1939	332000	104200	436200	2340000	6982	5.34	91	
and Tributaries	1940	285600	94670	380300	1964000	7498	5.10	94	
and	1941	284000	120400	404400	2043000	7647	5.00	96	
San Joaquin River	1942	283500	145600	429100	2271000	8500	5.23	92	
Stockton-Fremont Ford	1943	279500	185900	465400	2628000	8945	5.59	86	
and Tributaries	1944	290500	199900	490400	3069000	10005	6.20	78	
Including Old San Joaquin	1945	272900	187100	460000	3017000	10295	6.28	74	
and Tom Paine Slough	1946	303100	200200	503300	3312000	10482	6.52	74	
	1947	309300	202200	511500	3198000	10436	6.19	78	
	1948	347100	188900	536000	2921000	10827	5.40	89	
	Av. 1939 to 1948	298800	162900	461700	2676000	9162	5.68	85	
	1949	353800	217500	571200	3497000	11422	6.12	98	
									San Joaquin at Vernalis
San Joaquin River System									
San Joaquin River									
Stockton to Friant Dam									
and Tributaries	1946	407000	13310	420300	1401200	3785	3.33	146	92
Including	1947	441200	15160	456300	1304600	3699	2.86	170	55
Old San Joaquin	1948	441100	11250	452300	1233900	3984	2.73	178	92
Fresno Slough									
and	Av. 1946 to 1948	429800	13240	443000	1313000	3823	2.96	164	80
Fresno By-Pass									
Tom Paine Slough	1949	456300	19730	476000	1412100	3936	2.97	164	61
Combined above Delta									
Sacramento River									
and Tributaries									
and	1946	588100	211810	799900	4304000	12967	5.38	90	
San Joaquin River	1947	622900	215460	838400	4042000	12728	4.82	101	
Stockton to Friant Dam	1948	652700	199150	851800	3754000	13487	4.41	110	
and Tributaries									
Including	Av. 1946 to 1948	621200	208800	830000	4033000	13060	4.86	100	
Old San Joaquin									
Tom Paine Slough	1949	665100	236230	901300	4451000	13898	4.94	98	
Fresno Slough									
Fresno Slough By-Pass									

(1) Excluding municipal diversions on Sacramento River, the City of Sacramento and the City of Redding.

TABLE 142

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1949

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--"M" STREET BRIDGE - SACRAMENTO - MILE 0.0--													
--GAGING STATION AT SACRAMENTO - MILE 0.4--													
City of Sacramento	0.8L	1-18" 3-20"	2044	3130	3526	4623	4898	4520	4079	3099	(a)29919	Municipal	
--AMERICAN RIVER - MILE 1.1L													
--BACK BORROW PIT RECLAMATION DISTRICT 1000 - MILE 1.3L													
E. Fourness	1.45R	1-8"			28	64	70	53	20	55	290	168	
--RECLAMATION DISTRICT 1000 DRAIN - MILE 2.1L													
Elmer F. Christophel	2.15L	1-8"		15	18	28	29	2	19	4	115	38	
H. M. Swalley	2.30L	1-5"				PLANT REMOVED							
D. D. Parr	3.15L	1-6"			22	8	25		1		56	26	
Rose Orchard	3.55R	1-16"			254	270	281	62			867	165	
W. E. M. Beardsley Est.	3.75R	1-5"				PLANT REMOVED							
M. C. C. Van Loben Sells	4.0R	1-10"			134	40	125	108	98		505	150	
--SACRAMENTO WEIR - MILE 4.2--													
Reese and Greer	4.65R	1-7"			33	35	54				(b) 122	58	
A. M. Harbinson	5.05R	1-14"				134	27	50			211	61	
R. S. Seydel	5.25R	1-8"		1	4	55	60	23	1	1	145	190	
A. R. Merkley	5.3R	1-6"			13	64	26				103	59	
Lucy Casselman	5.5R	1-6"			21	21	13				55	35	
A. A. Casselman	5.55R	1-6"			5	25	17				47	40	
J. E. Bandy	6.0R	1-6"					10				10	48	
Riverside Mut. W. Co. (c)	6.1L	2-18"		174	672	913	888	1012	433	138	(d)4230	1329	
W. W. White (e)	6.6R	1-6"						21	28	5	54	66	
--RECLAMATION DISTRICT 1000 DRAIN #3 - MILE 6.85L--													
Fred C. Jones	7.5L	1-8"			10	21	45	37	18		131	84	
M. R. Williamson	7.8L	1-10"				74	25	15			114	93	
A. Marty	7.9R	1-8"			42	47	64	54			207	(f)300	
E. D. Willey	7.9L	1-10"			80	60	58	134	53		385	143	
M. Marty	8.3R	1-8"		1	128	92	166	198	107	24	(g)716	(h)	(h)
Blauth Estate	8.5R	1-7"			24	67	60	8			159	83	
H. Waldeck	8.7R	1-6"				NO DIVERSION							
Mullin and Plato	8.95R	1-6"				PLANT REMOVED							
Fong Yen, et al (i)	9.3L	1-10"		20	81	148	155	66	100		570	253	
Henry Amen	9.35R	1-14"			170	188	137	75	188		758	375	
F. C. Jones	9.8L	1-14"				NO DIVERSION							
Carl Casselman	9.9R	1-12"			109	8	198	116	41	26	498	123	
Lloyd M. Robbins	10.25L	1-14"			56	59	65	81	45		306	511	
Ray Hughes	10.65R	1-12"				134	177	65			376	85	
John Schachtili	10.75L	1-12"					107	36	41		184	100	
W. A. Ten Eyck	11.1R	1-12"				NO DIVERSION							
Federal Farm Mortgage Co.	11.6L	1-10"				PLANT REMOVED							
--ELKHORN FERRY - MILE 11.9--													
Conaway Ranch	12.0R	4-36"		5934	12799	16187	16107	15841	4547	853	(j)72268	2737	(k)8127
Thomas O'Connor Estate	12.5R	1-12"				32	20	17	6		75	40	

(a) Additional acre-feet diverted: January 2130, February 1845, November 2149 and December 1997.
(b) Additional water received from wells.
(c) Formerly listed as Riverside Mutual Water Co. (Natomas).
(d) Additional acre-feet diverted: November 264.
(e) Formerly listed as O. A. and F. L. White.
(f) Combined acreage this plant and one at Mile 8.3R.
(g) Additional acre-feet diverted: November 7.
(h) See plant at Mile 7.9R.
(i) Formerly listed as Fong Sik, Fong Shee, Wm. Fong.
(j) Additional acre-feet diverted: November 394 and December 1935.
(k) Includes 2411 rice outside ranch.

TABLE 142 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1949

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Gertrude Brown	12.7R	1-6"			1	24	31	40	40		136	40	
Frank F. Newmann	13.1R	1-12"		9	42	104	100	138	60		453	110	
J. Corey	13.2R	1-8"				NO DIVERSION							
J. De Nigris	13.25R	1-8"			61	35	74	48	6	41	265	75	
Elkhorn Mutual Water Co. (Natomas)	14.1L	1-20" 1-24"		331	1657	2290	2341	2014	1176		(a)9809	3120	209
Joseph Veress	14.25R	1-14"			55	104	158	135		4	456	240	
M. E. Dole	14.4R	1-6"				NO DIVERSION							
J. A. Damron (b)	15.1R	1-10"			53		58	37			148	150	
Central Mutual Water Co. (Natomas)	16.0L	1-24" 2-32" 2-28"		4740	10388	9592	10850	10540	7738	415	54263	(c,d)1771	7270
Henry Rich (Hershey Plant)	16.2R	1-20"			23	6		51			80	18	
H. T. Silvius	16.4R	1-6"				PLANT REMOVED							
Henry Rich	16.62R	1-14"			54	39	37				(e)130	85	
Henry Rich	17.0R	1-14"			12	45	37	1			95	30	
Frank and Ruth Lang	17.4R	1-16"				34	245	79			358	140	
Calif. W. States Life Ins. Co.	17.75R	1-16"				NO DIVERSION							
Jose Alves and Sons	18.0R	1-20"			324	397	294	399	124		1538	800	
H. C. Lauppe	18.2L	2-10"		63	21	84	184	79	25	1	(f)457	245	
M. and J. Scheiber	18.45L	1-12"				96	92	38	83	32	341	122	
J. R. Brannely	18.7L	1-8"				13	30	21			(g)64	35	
SACRAMENTO TO VERONA Totals			2044	14418	30920	36260	38438	36214	19077	4698	182069	14341	15606
Average cubic feet per second			33	242	503	609	625	589	321	76	375		
Monthly use in per cent of seasonal			1.1	7.9	17.0	19.9	21.1	19.9	10.4	2.6			
--VERONA GAGING STATION - MILE 19.6L													
--CROSS CANAL RECLAMATION DISTRICTS 1000 AND 1001 - MILE 19.6L													
Arthur Drown	*(0.5S)	1-20"			43	23	57	74	49	14	(h)260	110	
Natomas Central Mut. W. Co. (Bennett Subd. Plant)	*(1.0S)	1-24"		1696	2347	1847	2446	2269	981		11586	566	1332
Natomas Northern Mut. W. Co.	*(2.0S)	1-20" 2-24"		3194	5537	4554	4654	4141	2036		(i)24116	1508	3152
Natomas Co. (Ben May Plant)	*(3.35N)	(j)1-16" 1-12"	143	40	321	460	667	685	559		2875		331
Roy C. Osterli (k)	*(3.35N)	1-14"		193	84	308	542	650	709	304	2790		300
--FEATHER RIVER - MILE 20.9L--													
--SACRAMENTO SLOUGH - MILE 21.2L--													
West Coast Life Ins. Co.	21.7R	1-15"			9	169	209	157	60	3	607	150	
Henry Rich (Keller Plant)	22.5R	1-22"		812	837	37	459				2145	210	780
A. F. Johnston	26.8L	1-16"					44				44	170	
Anthony Furlan	26.8L	1-16"				NO DIVERSION							
--FREMONT WEIR GAGING STATION (WEST END WEIR) - MILE 28.0--													
Gustaf Inglin	28.2R	1-6"		12	18	11	20	28	8	11	108	36	
Russell Bros.	29.2R	1-12"			13	17	75	34			139	143	
M. R. Richardson (l)	29.7R	1-8"				NO DIVERSION							
Sebastine Yturralde	29.9L	1-12"				NO DIVERSION							
Leo Giovanetti	30.2L	1-5"				3	3	2			8	18	
Anthony Furlan (m)	30.5L	1-14"		114	344	290	324	404	146		1622	43	90
Kate Russell & P. L. Traganza	30.6R	1-12"				PLANT REMOVED							
M. R. Richardson (l)	30.7R	1-10"					35	16			51	15	

(a) Additional water received from plant at 16.0L.
(b) Formerly listed as Capital Company.
(c) Also furnished water to acreage served by plant at 14.1L and some additional water received from controlled drainage.
(d) Additional acre-feet diverted: November 78 and December 52.
(e) Additional acre-feet diverted: November 58.
(f) October diversion for sheep water.
(g) Additional acre-feet diverted: November 3.
(h) Additional water received from wells.
(i) Additional acre-feet diverted: December 231. Also additional water received from controlled drainage.
(j) The 12" unit removed in 1949.
(k) New installation in 1949.
(l) Formerly listed as Mrs. M. R. Richardson.
(m) Formerly listed as William Duffy, Jr.

* Cross Canal - the main drain between R. D. 1000 and 1001 joins the Sacramento River at Mile 19.6L. Distance from Sacramento River and the bank is shown in ().

TABLE 142 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1949

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Total Diversion March to October Acre-Feet	Acreage Irrigated General	Acreage Irrigated Rice
Albert Nuez (a)	30.75R	1-6"		3	3	4	4	8	7		29	15	
Alice E. West (b)	30.9L	1-6"					18				18	40	
A. C. Huston	31.5R	1-12"		85	63	96	66	58			368	150	
M. R. Richardson (c)	31.75R	1-10" (d)1-20"		189	608	645	679	768	427		3316	175	220
M. Alonso	31.8L	1-6"				1	6	3			10	30	
Sutter Mutual Water Co. (Portuguese)	32.0L	2-24" (e)1-20"		1856	3230	3007	3076	3367	1517	244	16297	1263	972
Collier Bros.	32.5R	1-10"			1	25	82	23	19		150	89	
Walter H. Zeigler	33.2L	2-10"		38	478	476	423	684	280		2379	360	160
J. G. Knox	33.35L	(f)1-10"			100		35				135	65	
Clarence de Boyce (g)	33.5R	1-12"				NO DIVERSION							
Mrs. Fred Leiser	33.75L	(h)1-14"			168	4	205	228			605	(i)355	
Neil Wilson	33.85R	1-6"				NO DIVERSION							
VERONA TO KNIGHTS LANDING Totals Average cubic feet per second Monthly use in per cent of seasonal			143 2 .2	8232 138 11.8	14204 231 20.4	11977 201 17.2	14129 230 20.3	13599 221 19.5	6798 114 9.8	576 9 .8	69658 143	5511	7337
--KNIGHTS LANDING GAGING STATION - MILE 34.0--													
--COLUSA BASIN DRAIN - MILE 34.15--													
River Farms Co. (j)	34.5L	1-24" 1-16" 1-20"		2389	1935	2934	3426	2592	476	718	(k)14470	825	1031
Commercial Investment Co.	34.85L	1-8" (l)1-12"					66	36	26		128	94	
Walter Raymond	35.2L	(m)1-12"				144	31	50	18		243	163	
Knox and Anderson (n)	35.8L	1-10"					45	15	5		65	70	
J. Goffitzer	35.85L	1-6"			17	8	17	7	8		57	15	
Kilgore and Rossi	36.2L	1-12" 1-14"		220	327	274	254	304	115		1494	42	165
R. H. Bailey	36.45L	1-8"			60	31	29	20		20	160	56	
Amedio Moroni	36.7L	1-5"				NO DIVERSION							
Albert Nuttal (o)	37.2L	1-14"				NO DIVERSION							
Maybelle J. Bundock	37.75L	1-8"			15	19	40	7			81	122	
Addie Reel	38.4L	1-10"				NO DIVERSION							
C. L. Reel	38.8L	1-10"			32	86	186	37			341	100	
F. O. Eastman	39.4L	1-12"				NO DIVERSION							
C. L. Reel	39.8L	1-10"				NO DIVERSION							
William Duffy, Jr.	39.9L	1-6"					12	5			17	25	
Sutter Mutual Water Company (State Ranch)	40.6L	2-24" 1-36"		3014	5285	5571	5337	5493	1905	157	(p)26762	3125	2093
River Farms Co.	41.0R	1-14" 1-16"		221	1429	1291	1385	1622	765		6713		(q)735
El Dorado Ranch	42.0R	1-14" (r)1-16"			203	94	229	36		281	843	496	
Buell Ranch (M. K. Dean) (s)	42.2L	1-6"					23	22			45	18	
Matteoli and Fracchia	42.3L	1-8"			46		21	14			81	50	
Kramer Ranch	43.1L	1-12"						99			99	110	
Reclamation District #2047	43.1R	2-50"		8064	11706	12027	12963	11872	2601		59233	(t)961	(t)5961
El Dorado Ranch	43.1R	(u)1-18"				NO DIVERSION							

(a) Formerly listed as Albert Nusz.
(b) Reinstallation at old point of diversion.
(c) Formerly listed as Mrs. M. R. Richardson.
(d) New unit installed 1949.
(e) New unit installed 1949.
(f) Replace 8" unit formerly listed at this location.
(g) Formerly listed as Orrick and Tadlock.
(h) An 8" unit removed in 1949.
(i) Includes 80 acres on adjoining White lands.
(j) New installation in 1949, however this company has diverted in other years at a point approximately 0.3 Miles downstream.
(k) Additional acre-feet diverted: November 40.
(l) Operated 8" only in 1949.
(m) New 12" unit replaces 7" and 12" formerly listed at this location.
(n) Formerly listed as Susie M. Donnely.
(o) Formerly listed as Robert Bottimore.
(p) Additional acre-feet diverted: November 50.
(q) Includes 276 acres served by controlled drainage.
(r) Operated 14" only in 1949.
(s) Reinstallation at old point of diversion.
(t) Includes acreages irrigated as follows: R.D. #108 - Rice 5257, General crops 637. River Farms Co. - Rice 704, General crops 324.
(u) New 18" unit replacing 18" unit formerly listed at this location.

TABLE 142 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1949

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March on October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--RECLAMATION DISTRICT #108 DRAINAGE PLANT - MILE 44.0R--													
John Clauss (Fuchlin)	44.2L	1-18"		519	911	790	764	859	724	83	4650	(a)490	(a)260
John Clauss (Fuchlin)	45.6L	1-14"		377	352	574	656	720	286		2965	(b)	(b)
P. J. Hiatt	48.7L	2-20"		1159	1461	1054	1584	1134	403		6795	460	260
G. J. Hiatt	49.7L	1-14"				NO DIVERSION							
Reclamation District #108 (Tyndall)	51.1R	2-24" 1-36"		3547	6025	3990	5087	4278	1738		24665	340	1891
Holmes & Westover Co.	51.2L	2-16"		617	1128	1125	1667	1070	159		5766	380	360
B. M. Chaplin	52.0L	1-16"			205		69	59			333	145	
George Van Ruiten	52.9L	1-10"					82	26			108	(c)400	
River Farms Co.	(d)53.8R	(e)1-10" 1-12"			346	181	372	170	333		(f)1402	647	
George Van Ruiten	53.9L	1-12"					167	102	70		339	(g)	
Broomieside Farm	55.1L	1-20"				100	303	103			506	340	
Phillip J. Enright (h)	56.3L	(i)1-16"					288	104	40		432	135	
Reclamation District #108 (Boyer)	56.4R	(j)1-12" (j)1-18" (j)1-18"		693	682	1341	1708	1630	105		(k)6159	390	170
C. M. Miller	56.42R	1-6"				NO DIVERSION							
Jacob Miller	56.65R	1-12"				NO DIVERSION							
Broomieside Farm (S. C. Crawford)	56.95L	1-20" (l)1-14"		1331	685	1559	1613	1643	1400	249	8480	(m)600	(m,n)1465
L. M. Miller	57.0R	1-10"			67	2	59	116	80	27	351	120	
Lamb Brothers	57.5L	1-16"			65	227	275	258			825	150	
J. A. Neilsen (o)	58.2L	1-15"		5	67	251	54	122			(p)499	234	
Alex Grant	58.9L	1-16"				74	7	100			181	161	
I. G. Zumwalt	59.1R	1-12"				NO DIVERSION							
Lamb Bros.	59.8L	1-12" 1-14"		334	1279	1143	1207	977	821		5761	(q)	(q)
Reclamation District #108 (Coles)	59.85R	1-16"				PLANT REMOVED							
F. L. Burrell	60.4L	(r)1-14" (r)1-16"		333	910	1029	1636	1834	740		6482	495	500
A. Earl Lane	60.5L	1-12"				80	73	40	3		196	125	
Robert Lane	61.35L	1-12"				NO DIVERSION							
I. G. Zumwalt	61.5R	1-12"				18	23	15			56	50	
Samuel Hines	62.3R	1-10"			5	13	4	11	13		46	32	
Jake Broyles (s)	62.3L	(t)1-14"		76	242	327	358	234	169	147	(u)1553	360	
Jake Locovitch	62.6R	1-8"					27	10			37	30	
R. L. Young	62.8L	1-12"			11	61	71	35	4	3	(v)185	75	
KNIGHTS LANDING TO WILKINS SLOUGH Totals Average cubic feet per second Monthly use in per cent of seasonal			0 0 0	22899 385 12.1	35496 577 18.7	36418 612 19.2	42218 686 22.3	37881 616 20.0	13007 219 6.8	1685 27 .9	189604 390	12431	14891
--WILKINS SLOUGH GAGING STATION - MILE 62.9--													
Reclamation District #108 (Wilkins Slough)	63.2R	(w)5-42"		14687	22963	23814	24776	22129	2464		110833	402	(x)14003
Lueltha Meister	63.65L	1-8"			25	47	61	44	32	19	(y)228	109	
Sutter Mutual Water Co. (Tisdale Pls. #1 and 2)	63.75L	6-42" 2-48"		23395	38683	37340	40915	38905	15765	4685	(z)199688	18596	13698

(a) Combined acreage this plant and one at 45.6L.
(b) See plant at Mile 44.2L.
(c) Combined acreage this plant and one at Mile 53.9L.
(d) Formerly listed at Mile 52.35L.
(e) The 10" unit removed in 1949.
(f) Additional water received from plant at 56.4R.
(g) See plant at Mile 52.9L.
(h) Formerly listed as C. L. Enright.
(i) Listed as 10" in 1948 report.
(j) These units replace 18" and 30" units formerly listed at this location.
(k) Furnished some water to lands served by plant at 53.8R.
(l) Temporary unit installed in 1949.
(m) This is all Sutter Basin District lands.
(n) Combined acreage this plant and one at Mile 59.8L.
(o) Formerly listed as Mrs. James A. Neilsen.
(p) Additional water received from wells.
(q) See plant at Mile 56.95L.
(r) Replaces 10" unit formerly listed at this location.
(s) Formerly listed as Jake Brayles.
(t) Replaces 10" unit formerly listed at this location.
(u) Additional acre-feet diverted: November 33.
(v) Additional acre-feet diverted: November 1.
(w) The 36" unit removed in 1949.
(x) Includes 1150 acres served by controlled drainage.
(y) Additional acre-feet diverted: November 6.
(z) Additional acre-feet diverted: November 1123.

TABLE 142 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1949

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Edmund Seaman Estate (a)	63.9L	2-14"			328	266	385	269			1248	437	
--TISDALE WEIR - MILE 64.2L--													
Ornbaum, Nobles Land and Livestock Co.	64.3R	1-12"			29	27	20	9	16		(b)101	45	
Tisdale Irrig. & Dr. Co.	64.4L	1-12"		5	340	243	310	256			(c)1154	(d)454	
Van Horn Ranch	64.9R	1-14"					44				44	80	
Juan Valsyvez	65.1R	1-4"					27	16	5		48	30	
Walter Ettyl	65.7L	1-8"				132	131	100			363	137	
Fred Schohr	65.8R	1-16"				NO DIVERSION							
J. L. Browning	66.4R	1-18"				NO DIVERSION							
Tisdale Irrig. & Dr. Co.	67.1L	1-12" 1-20"		926	1121	1385	1717	1478	517		7144	1290	(e)660
Desmond A. Winship	67.2L	1-10"				PLANT REMOVED							
Newhall Land & Farming Co.	67.5L	1-12" 2-24"		1516	2214	2147	2238	2325	563		11003	3414	330
--RECLAMATION DISTRICT #70 DRAIN PLANT - MILE 68.8L--													
J. L. Browning	69.0R	1-24"				397	623	367			1387	630	
Faxon, Morton & P. Andreotti	69.2R	1-18"			319	38	244	133	106	85	(f)925	372	
--EDDY'S FERRY SITE (GRIMES) - MILE 69.45--													
J. E. Hollenbeck	69.8R	1-4"				1	1	1			3	5	
H. F. Daly	70.4L	1-10"			22	24	52	36	23		157	(g)86	
Hoffman, Beckley, Ritchie Poundstone and Andreotti (h)	70.4R	1-6" (i)1-20" 1-24"			95	170	128	93	42	11	539	148	
Meridan Farms Water Co. #4	71.1L	1-24"		659	1391	1378	1413	469			5310	1495	602
A. B. Armstrong	71.9R	(j)1-14"			185	19	89	36	7		336	165	
Antone Steidlmayer	71.9R	1-12"				PLANT REMOVED							
H. and A. Andreotti	72.1L	2-14"		631	523	512	603	697	202		3168	100	400
H. and A. Andreotti	72.3L	1-7"				PLANT REMOVED							
E. B. Vann (Froh)	73.6R	1-10"				NO DIVERSION							
Meridian Farms Water Co. #3	74.8L	(k)1-10" 1-18"		760	772	952	873	786	366		4509	373	262
L. B. Westfall	75.3R	1-10"			249		126	85	6		466	(l)165	
J. H. Yates Estate	76.1L	1-10"		17	33	47	35	43			175	(m)127	
Robert Chesney	76.15L	1-10"		86	132	199	321	215	64		1017	37	75
M. S. Davis and C. K. Anderson	76.2L	1-8"			19	7	25				51	(n)68	
Steidlmayer Bros.	76.5R	1-16"			243		242				485	190	
Hankins Bros. (o)	77.9L	(p)1-16"			211	319	17				547	290	
Sebia Davis Estate	78.2R	1-16"				NO DIVERSION							
Sebia Davis Estate	78.75R	2-12" 1-16"			534	43	341	196			1114	450	
Sebia Davis Estate	78.8R	1-24"		894	2382	2210	2471	1927			9884	50	(q)1447
C. E. Reische	79.0L	1-10"		18	123	83	80	64			368	166	
Steidlmayer Bros.	79.0R	1-12"							108	39	147	80	
Mayfair Packing Co.	79.3R	1-10"			36	81	37	23			(r)177	80	
Hankins Bros. (s)	79.5L	1-8"			12	9					21	39	
Steve M. Burtis and G. Wood	79.7L	1-10"			72		27	5	2		106	(t)102	

(a) Formerly listed as Edward Seaman.
(b) Additional acre-feet diverted: November 2.
(c) Additional acre-feet diverted: November 3.
(d) Includes 120 acres on Chesini Bros. land.
(e) Includes 140 acres on Winship lands.
(f) Additional acre-feet diverted: November 17.
(g) Includes 40 acres of Rohleter lands.
(h) Formerly listed as Hoffman, Beckley, Ritchie, Poundstone and Denny.
(i) Operated 20" only in 1949.
(j) Replaces 12" formerly listed at this location.
(k) The 10" unit installed temporarily during 1949.
(l) Includes 110 acres of Steidlmayer lands.
(m) Includes 62 acres of Coffman, Moore, and Miller lands.
(n) Includes 19 acres on Albertson lands.
(o) Formerly listed as E. V. Jacobs.
(p) Replaces 12" unit formerly listed at this location.
(q) Cooperation diversion with plant on Back Borrow Pit at Mile 31.5L.
(r) Additional acre-feet diverted: November 34.
(s) Formerly listed as E. V. Jacobs.
(t) Includes 50 acres of Burtis lands and 52 acres Wood lands.

TABLE 142 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1949

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--MERIDIAN BRIDGE - MILE 79.85--													
Meridian Farms Water Co. #1 and #2	80.0L	1-20" 1-24"		2518	2516	3036	3927	3165	1145		16307	(a)4542	(a)1231
Roger C. Wilbur	80.3R	1-8"		77	33	112	101	30		69	422	65	
Wayne Hall and L. Burrows	81.5L	1-16"		24	41	41	14		35		155	64	
Wayne Hall	81.8L	1-16"		419	811	787	888	926	169		4000	60	240
F. T. Reische and L. F. Wood	82.5L	(b)1-12"				2	56	39	17	14	128	82	
Steidlmayer Bros.	(c)83.0R	1-20"		88	393	310	838	371	59	19	(d)2078	330	
J. E. Clark	83.3L	1-14"				NO DIVERSION							
J. E. Clark	83.5L	1-10"			13	37	66	42	16		174	120	
--BUTTE SLOUGH OUTFALL GATES - MILE 84.0L--													
Steidlmayer Bros.	85.6R	1-12"				NO DIVERSION							
Clifford Reichel	85.8L	1-8"				31	24				55	27	
W. H. Halsey	86.1R	1-12"			142	73	99	55	17	52	438	238	
Lydell Peck	86.1L	1-8"		12	20	142	112			22	308	60	
Howell Davis	86.2R	1-18"			77		113	106			296	160	
Lloyd Scoggins	86.8L	1-8"	4	58	14	51	51				178	45	
Roger Wilbur	86.9R	1-10"		44	128	141	151	140	117	137	(e)858	(f)218	
Roger Wilbur	87.4R	(g)1-10"			18	69	58	30		38	213	(h)	
Jacobsen and O'Rourke	87.6L	1-8"			17	1	24				42	(i)42	
Swinford Tract Irrigation Co.	87.7R	(j)1-12"				130	110	20	9	15	284	120	
Edward K. Lange	88.0R	1-6"		7		6	7				(k)20	20	
Nagel and Locovitch	88.2L	1-10"			12	44	44	11			(l)111	38	
Ross Wilbur (m)	88.4L	1-20"			188						188	40	
Mayfair Packing Co.	88.7L	1-14"			168	332	232			116	(n)848	(o)248	
Colusa Irrigation Co.	89.2R	1-20"			312	209	570	123	42		1256	388	
Grace S. Arnold (p)	89.25L	1-8"			87	50	82				219	65	
Reclamation District #1004 (q)	89.25L	1-12" 1-18"			874	1118	1154	1242	531		(r)4919	(r)300	(r)2200
G. A. Berkey	89.26L	1-12"			92	132	120				344	100	
WILKINS SLOUGH TO COLUSA													
Totals			4	46841	79012	78744	87213	77007	22445	5321	396587	37584	35148
Average cubic feet per second			0	787	1285	1323	1418	1252	377	87	816		
Monthly use in per cent of seasonal			0	11.8	19.9	19.9	22.0	19.4	5.7	1.3			
--COLUSA BRIDGE AND GAGING STATION - MILE 89.4--													
Lillian and Hattie Boggs	89.7L	(s)1-10"			208	3	1	1			213	65	
Roberts Ditch Company	90.7R	(t)2-20"	15	255	440	768	738	651	371	293	(u)3531	947	
I. G. Zumwalt (m)	91.0R	1-6"					3				3	14	
Paul R. Westfall	91.1L	1-8"					25	17			42	24	
I. G. Zumwalt	91.6R	1-12"			79	84	34				197	125	
George P. Ahlf	92.5L	1-6" 1-10"				NO DIVERSION							
Paul R. Westfall	93.0L	1-8"				PLANT REMOVED							
W. H. Halsey and M. Yerxa	93.0R	(v)1-8"			19	15	15				49	35	
Paul R. Westfall	93.4L	1-10"			10	88	51	61	45		(w)255	95	
Tuttle Land Co.	94.3R	(x)1-15" 1-20"		26	103	108	204	152	312	19	924	(y)202	
Roger Wilbur	95.25L	1-18" (m)1-12"		292	719	654	743	648	91	162	(z)3309	205	290

(a) Includes acreage irrigated from controlled drainage. Rice 410 and general crops 686.
(b) New unit replacing unit formerly listed at this location.
(c) Formerly listed at 81.9R.
(d) Additional acre-feet diverted: November 73.
(e) Additional acre-feet diverted: November 9.
(f) Combined acreage this plant and one at Mile 87.4R.
(g) New unit replaces 10" unit formerly listed at this location.
(h) See plant at Mile 86.9R.
(i) Includes 2 acres of Locovitch lands.
(j) New 12" unit replaces 12" formerly listed at this location.
(k) Additional acre-feet diverted: November 7.
(l) Also furnished some water to lands under plant at Mile 88.7L.
(m) New installation 1949.
(n) Also receives some water from pump at Mile 88.2L.
(o) Includes 120 acres of De Jarrnett lands.
(p) Formerly listed as Phil B. Arnold.
(q) Formerly listed as Butte Creek Farms.
(r) Additional water received from plant on Butte Creek Mile 4.3R.
(s) Replaces 8" unit formerly listed at this location.
(t) Operated only one unit in 1949.
(u) Additional acre-feet diverted: November 29 and additional water received from wells.
(v) Replaces 12" unit formerly listed at this location.
(w) Additional acre-feet diverted: November 7.
(x) Removed 15" unit in 1949.
(y) Includes 25 acres on Mayfair Packing Company lands and 8 acres on Halsey lands.
(z) Additional acre-feet diverted: November 61.

TABLE 142 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1949

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
George W. Lewis	95.6L	1-20"			1037	1025	769	1119	251		4201	100	400
Bridget Graham Ranch	95.8L	1-18"				NO DIVERSION							
I. G. Zumwalt	96.8R	1-15"			124	101	74		97		(a)396	374	
H. Heitman	97.7R	1-12"			29	128	95	61	151	43	507	135	
Frank N. Beckley	98.0L	1-10"				13	10	21			44	(b)140	
J. L. Erisey	98.3R	1-10"					39	35		22	96	55	
Otterson and Boggs	98.6L	1-15"				NO DIVERSION							
D. Boggs	98.8L	1-18"		18	6	22	20	8	10	8	92	50	
B. H. Mitchell Estate	99.0R	1-14"				NO DIVERSION						(c)	(c)
J. E. Boggs (d)	99.1L	1-10"		18	219	21	22				(e)280	38	
Terrill and Sartain	99.2L	1-20"		74	1169	1031	1068	1220	572		5134	(f)60	(f,g)695
L. W. Seavers	99.3R	1-10" 1-12"		46	115	148	286	67	51	78	(h)791	(i)205	
H. M. Forry	99.8L	1-16"				NO DIVERSION							
St. Patrick Home Ranch	101.1R	1-20"			100	97	108	13			318	142	
Nettie, George & Ella Packer	102.8R	1-20"			93		371	287	329	369	(j)1449	(k)270	
Charles W. Welch	103.7R	1-16"		385	798	694	581	882	119		(l)3459	40	(m)600
Charles W. Welch	103.8R	1-14"		225	726	667	490	769	177		3054		(n)
C. W. Tuttle	103.9R	1-12" 1-18"		576	1229	1009	1115	1232	149		5310	150	310
I. G. Zumwalt	104.8L	1-12"			60		65			63	(o) 188	95	
Lawrence Boyd	105.5L	1-10"						8			8	9	
Thousand Acre Ranch (H. W. Keller)	106.0R	1-14"			87	16	83	44			230	145	
Howell Davis	106.5R	1-16"				NO DIVERSION							
Princeton Ranch Co.	110.0R	1-12"			94	74	82			35	285	179	
I. G. Zumwalt	110.7L	1-16"			201	71					272	160	
Princeton Ranch Co.	111.2R	1-6"					12	15			27	28	
--PRINCETON FERRY - MILE 112.0--													
I. G. Zumwalt	112.05L	(p)1-12"				37		14			51	65	
Reclamation District #1004	112.1L	2-30" 1-50"		3739	7785	8077	11669	9716	2576		43562	(q,r)2128	(q,r)5785
Princeton-Codora Glenn I.D.	112.4R	3-24"		1454	3532	3444	4505	4035	875		17845	(s)	(s)
I. G. Zumwalt	112.6L	1-10"			79	80	63			89	311	220	
Edward L. Steele Estate	115.5L	1-12"			15	13	12	12		13	65	32	
COLUSA TO BUTTE CITY Totals			15	7108	19076	18488	23353	21088	6176	1194	96498	6532	8080
Average cubic feet per second			0	119	310	311	380	343	104	19	199		
Monthly use in per cent of seasonal			0	7.4	19.8	19.2	24.2	21.8	6.4	1.2			
--BUTTE CITY GAGING STATION - MILE 115.8--													
R. H. Gebicke	115.85L	1-14"			185	96	66	146	114	2	609	150	
W. F. Wright, Jr.	116.7R	1-10"			34	56	40	7			137	148	
R. H. Gebicke	116.9L	(t)1-16"			159	64	68	164	4		(u)459	80	
Robert T. Millar (v)	122.3R	1-10"			55	62	29	50	12		208	43	
Clarence Reed	123.7R	1-6"		1	7	16	19	11	17	8	(w)79	35	
Howard Leach	123.8R	1-4"				1	1				2	2	
Princeton-Codora-Glenn I.D.	123.9R	3-24"		3153	5651	5573	4743	3982	3514	1720	28336	(s)	(s)
Provident Irrigation District	124.2R	1-36" 4-42"		789	2946	4055	8197	9371	232		(x)25590	(s)	(s)
Duart Geise (y)	129.35R	1-6"			17	55	11	8	29		120	50	

(a) Additional acre-feet diverted: November 82.
(b) Includes 35 acres on O'Sullivan lands.
(c) 80 acres served from plant at 99.3R.
(d) Formerly listed as J. P. Boggs in 1947.
(e) Also furnishes some water to plant at 99.2L.
(f) Includes 70 acres Otterson lands and includes 40 acres George lands.
(g) Also receives some water from pump at Mile 99.1L.
(h) Additional acre-feet diverted: November 53.
(i) Includes 80 acres Mitchell lands and 20 acres Middlecamp lands.
(j) Additional acre-feet diverted: November 71.
(k) Also served by wells and includes 25 acres of Gun club.
(l) Additional acre-feet diverted: November 9.
(m) Combined acreage this plant and one at Sacramento River Mile 103.8R.
(n) See plant at 103.7R.
(o) Additional water received from wells.
(p) Replaces 10" gas unit formerly listed at this location.
(q) Combined acreage this plant and those on Butte Creek at Miles 11.8R and 14.4R.
(r) Includes 1740 acres Duck club lands and also includes 120 rice and 75 acres sudan outside district.
(s) See plant at Mile 154.8R.
(t) Replaces 12" unit formerly listed at this location.
(u) Additional acre-feet diverted: November 126.
(v) Formerly listed as Robert T. Miller.
(w) Additional acre-feet diverted: November 6.
(x) Includes following acre-feet furnished to plant at Mile 154.8R: April 789, May 2946, July 2321 and August 3431. Additional acre-feet diverted: December 474.
(y) New installation, 1949.

TABLE 142 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1949

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
F. S. Reager	130.75R	1-8"		56	9	74	101	107	36		383	145	
--ORD FERRY - MILE 130.8--													
Ed Cramer	131.22L	1-6"				NO DIVERSION							
E. S. Ballard (a)	133.4L	1-6"					10	27	9		46	(b)75	
E. S. Ballard (a)	133.45L	1-6"					53	84	27		164	(c)	
M. & T. Inc. and Parrott Investment Co.	141.5L	1-20" 4-24"		716	649	3207	5427	6035	2321	733	(d)19088	(e)3468	(e)3713
--OLD CHICO LANDING RAILROAD BRIDGE SITE - MILE 142.1--													
Alameda Putney	143.8L	1-6"			41	28	21	23	15		128	43	
Lloyd & D. A. Hazelton (a)	146.1R	1-10"			5		10	7		22	104		
Holly Sugar Corporation	148.9R	1-10"				NO DIVERSION							
W. E. Ferrin and G. A. Zundel (a)	149.5L	1-12"		29	57	82	147	83	21		419	240	
James A. Lewis (f)	150.0L	1-10"			154	43	105	149	22	76	549	145	
V. G. Strain	150.8R	1-12" 1-16"	33	457	119	433	462	368	147	149	(g)2168	490	
A. Holecek	152.2R	1-6"		26	5	17	24	29	22	1	(h)124	48	
W. M. Edwards and Son (a)	152.4R	1-10"					16	25	21		(i)62	40	
R. E. Jessie	154.6R	1-5"			2	2	2	2			8	12	
G. G. Maas (j)	154.7R	1-4"			1	3	1	3			8	9	
Glenn-Colusa Irr. Dist.	(k)154.8R	2-30" 1-42" 2-50" 2-66" 4-72" 1-108"		39031	107512	108644	122889	112894	63088	39451	(l)593509	(m)26128	(n)38128
Jacinto Irr. Dist.	(k)154.8R	(k)		3531	5074	5732	5326	4939	4324	3878	(o)32804	8966	
Compton-Delevan Irr. Dist.	(k)154.8R	(k)		2747	5494	3662	2747	2747	915	60	(p)18372	(q)86	2616
Provident Irr. Dist.	(k)154.8R	(k)		4370	8983	3420	776	1293	2937		21779	(r,s)4594	(s)8016
Princeton-Codora-Glenn Irr. Dist.	(k)154.8R	(k)		302		3132	2547	2645	1912		(t)10538	(u)2342	(u)3465
Maxwell Irr. Dist.	(k)154.8R	(k)			643	378	378	378	113		(v)1890		269
J. Ewert (w)	155.6R	1-2⅛"					1	1			2	3	
R. Pheiffer (x)	155.7R	1-2⅛"		3	3	4	5	6	3	2	26	7	
F. Williams (y)	156.0R	1-8"				NO DIVERSION							
O. L. Shearman (y)	156.8R	1-2⅛"			1	1	1	1	1		5	4	
Jonathan Garst	161.7L	1-12"				NO DIVERSION							
--CORNING-VINA BRIDGE - MILE 166.5--													
E. L. Dietz	166.7R	1-3"			2	3	5	4	3	2	19	8	
G. C. Kelber	166.8R	1-2"			1	1	1	1	1	1	(z)6	5	
Ernest Peterson (y)	166.9R	1-6"			1	18	23	11	4	3	60	30	
--TEHAMA BRIDGE - MILE 177.5--													
E. B. Noble	184.5R	1-14"				PLANT REMOVED							
Coneland Water Company	187.6L	1-12"			154	298	382	19	4		(aa) 857	1174	
Henry Tieden	188.6L	1-8"		1	1	5	6	1	1	1	16	14	

(a) New installation, 1949.
(b) Combined acreage this plant and one at Mile 133.45L.
(c) See plant at Mile 133.4L.
(d) Additional acre-feet diverted: November 465. Additional water received from Butte Creek by gravity.
(e) Acreages divided as follows: Phelan Ranch; rice 838 and pasture 1351. The Parrott Ranch; rice 2875, pasture 1030, cover crop 451 and alfalfa and orchard 637.
(f) Formerly listed as Capitol Company.
(g) Additional acre-feet diverted: February 53 and November 20.
(h) Additional acre-feet diverted: November 5.
(i) Additional acre-feet diverted: November 9.
(j) Formerly listed as Maas Brothers.
(k) This is a common point of diversion for Glenn-Colusa, Compton-Delevan, Provident, Princeton-Codora-Glenn and Maxwell Irrigation Districts. See G.C.I.D. plant at Mile 154.8R.
(l) Additional acre-feet diverted: November 20982. Also diverted by gravity from Stony Creek in acre-feet as follows: April 26317, May 4770 and June 662.
(m) Includes 207 acres duck clubs and also includes 30 acres outside district.
(n) Includes 1423 acres outside district. Approximately 200 acres re-used for gun club.
(o) Additional acre-feet diverted: November 1220.
(p) Additional acre-feet diverted: November 90.
(q) All gun club lands.
(r) Includes 3500 acres gun club lands.
(s) Combined acreage this plant and one at Mile 124.2R and those on Colusa Trough at Miles 20.5R, 24.2R and 27.2R.
(t) Additional acre-feet received from plant at Mile 124.2R: April 789, May 2946, July 2321 and August 3431.
(u) Combined acreage this plant and one at Mile 112.4R and one at Mile 123.9R.
(v) This is all derived from controlled drainage.
(w) Installed in 1947 not previously listed.
(x) Installed in 1948 not previously listed.
(y) Installed prior to 1949 not previously listed.
(z) Additional acre-feet diverted: November 0.5.
(aa) Additional water received from wells.

TABLE 142 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1949

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--RED BLUFF BRIDGE - MILE 193.45--													
G. E. Sutton	196.2R	1-3"				PLANT REMOVED							
Dave Singletary	196.5L	1-2½"				NO DIVERSION							
S. & E. Erickson	196.6L	1-5"		10	16	20	39	8	11	1	105	33	
BUTTE CITY TO RED BLUFF													
Totals			33	55222	137981	139185	154579	145629	79880	46088	758697	48721	56207
Average cubic feet per second			1	928	2243	2339	2516	2368	1342	750	1561		
Monthly use in per cent of seasonal			0	7.3	18.2	18.3	20.4	19.2	10.5	6.1			
--RED BLUFF GAGING STATION (IRON CANYON) - MILE 198.6--													
--BEND FERRY BRIDGE - MILE 207.0--													
C. C. Budd (J. E. Breeden)	207.75L	1-10"				PLANT REMOVED							
C. C. Budd (J. E. Breeden)(a)	208.75L	1-8"				11					11	15	
Emil S. Johnson	209.0L	(b)1-3"				5	8	6	5		24	10	
J. F. Nunes	213.0R	1-7"				NO DIVERSION							
F. L. Jelly	213.5L	(b)1-3"				2		1			3	10	
J. F. Nunes	216.0R	1-3"			9	15	18	16	14	16	(c)88	20	
W. A. Hunaeus	216.4L	1-3"				10	5	10	4	2	31	10	
Haakonson Brothers	217.5L	1-3½"			1	32	29	4			66	78	
J. L. Haskins	217.9L	(d)1-6"				17	106	25	30	8	(e)186	(f)50	
J. L. Haskins	218.0L	1-5"				11	11				22	(g)	
Rio Alto Rancho	221.0R	1-10"				NO DIVERSION							
--BATTLE CREEK NEAR COTTONWOOD - MILE 221.5L--													
--COTTONWOOD CREEK NEAR COTTONWOOD - MILE 222.2R--													
--BALLS FERRY BRIDGE - MILE 224.5--													
--ANDERSON BRIDGE - MILE 232.9--													
L. C. Smith	233.0L	1-6"				PLANT REMOVED							
Menzel Estate	240.2L	1-12"		39	88	207	363	234	124	28	1083	151	
--GAGING STATION NEAR REDDING - MILE 240.7--													
W. A. Lucy Keagy (a)	240.4L	1-4"			4	2	6	2	1		15	7	
Anderson-Cottonwood Irr. Dist.	240.5L	3-16"		1719	2592	3260	3431	3253	2858	2778	19891	(h)18000	
Jack Graf	241.5L	1-8"				PLANT REMOVED							
--REDDING-ALTURAS FREE BRIDGE - MILE 242.0--													
--REDDING-YREKA BRIDGE - MILE 245.9--													
Anderson-Cottonwood Irr. Dist.	246.0R	Gravity		10387	25051	24301	25434	24377	22482	22663	(i)154995	(j)	
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 246.25--													
I. and M. Diestelhorst (k)	246.3R	1-8"			7	16	33	22	18	2	98	24	
--OLD REDDING-YREKA BRIDGE - 246.4--													
City of Redding	246.7R	3-8"	150	273	323	536	638	537	448	332	(l)3237	Municipal	
--GAGING STATION AT KESWICK - MILE 250.5--													
RED BLUFF TO REDDING													
Totals			150	12718	28075	28425	30082	28487	25984	25829	179750	18375	
Average cubic feet per second			2	214	457	478	489	463	437	420	370		
Monthly use in per cent of seasonal			0.1	7.1	15.6	15.8	16.7	15.8	14.5	14.4			
SACRAMENTO TO REDDING													
Totals			2389	167438	344764	349497	390112	359905	173367	85391	1872863	143495	137269
Average cubic feet per second			39	2814	5607	5874	6344	5853	2914	1389	3854		
Monthly use in per cent of seasonal			0.1	8.9	18.4	18.7	20.8	19.2	9.3	4.6			

(a) New installation, 1949
(b) Replaces 2½" unit formerly listed at this location.
(c) Additional acre-feet diverted: November 10.
(d) Replaces 5" unit formerly listed at this location.
(e) Additional acre-feet diverted: November 7.
(f) Combined acreage this plant and one at Mile 218.0L.
(g) See plant at Mile 217.9L.
(h) Combined acreage this plant and gravity diversion at Mile 246.0R.
(i) Additional acre-feet diverted: November 2337.
(j) See plant at Mile 240.5L.
(k) Formerly listed as Isabel and Maybell Diestelhorst.
(l) Additional acre-feet diverted: January 145, February 147, November 192 and December 160.

TABLE 143

DIVERSIONS AND ACREAGES IRRIGATED - COLUSA TROUGH*- 1949

Water User	Mile and Bank**	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--COLUSA-WILLIAMS HIGHWAY - GAGING STATION - MILE 0.0--													
I. G. Zumwalt	2.2L	4-20"		219	2869	2633	2633	1933	1538	671	(a)12496	2695	1310
F. Buffum and L. W. Seavers	3.0L	2-16"		224	459	464	517	303	430	153	(b)2550	355	
Lloyd W. Seavers and F. J. Byington	4.5L	3-16"		378	1369	1180	1291	709			4927		500
Coffman & Camel (c)	5.6L	1-16"		224	90	542	722	155			1733		220
S. Ash	8.0L	(d)1-15"			612	363	312	282	33		1602		200
Charles Welch	8.0R	1-15" (e)1-16"			599	644	800	668	216		2927		450
El Dorado Sportsmans Club	9.5R	1-15"			579	783	795	799	469	74	(f)3499		400
I. G. Zumwalt	9.75L	1-24"				NO DIVERSION							
Lloyd Kahn	10.5L	(g)2-20"	2		698	783	538	701	305		(h)3027		250
Charles Welch	11.7L	1-12"				NO DIVERSION							
Charles Welch	11.7R	1-14" (i)1-16" (i)2-20"		715	1510	1445	1362	1925	472		(j)7429		1500
Del Valley Farms Co.	12.1R	1-10"		37	462	534	436	609	130		(k)2208		125
R. J. & W. Dillard and Mr. Helphenstine (c)	12.69L	1-16"		125	285	209	221	368			1208		130
E. Butler, E. Meyer and J. Jones	12.7L	1-14"			153	285	215	324	217	17	(l)1211		90
Manuel Barrett (c)	16.6R	1-12"			78	149	188	255			670		180
--LATERAL HIGHWAY - BUTTE CITY TO WEST SIDE - MILE 20.5--													
Provident Irr. Dist. (Willow Creek Plant)	(m) Opp. 20.5R	1-24" 1-26"		466	575	793	1119	952			(n)3905	(o)	(o)
Walter McGowan	(m) Opp. 21.4R	2-16"	39	221	357	344	326	369	37		(p)1693		206
Joe Navarro (q)	22.0R	1-18"		41	44	118	61	70	66	30	(r)430	90	
Provident Irr. Dist. (Drain #55)	(s) Opp. 24.2R	Gravity		916	4072	5528	6444	6641	5950	4721	(t)34272	(o)	(o)
Provident Irr. Dist. (Drain #13)	(u) Opp. 27.2R	1-20" 1-24"		4	562	1276	1109	1233	270		4454	(o)	(o)
Totals			41	3570	15373	18073	19089	18296	10133	5666	90241	3140	5561
Average cubic feet per second			1	60	250	304	310	298	170	92	186		
Monthly use in per cent of seasonal			0	4.0	17.0	20.0	21.2	20.3	11.2	6.3			

* Main Drain of Reclamation District #2047.
** Mileage along Colusa Trough above Colusa-Williams Highway.
(a) Additional acre-feet diverted: November 905 and December 555.
(b) Additional acre-feet diverted: November 163 and December 9.
(c) New installation 1949.
(d) Replaces 20" unit formerly listed at this location.
(e) New unit added in 1949.
(f) Additional acre-feet diverted: November 86 and December 214.
(g) Replaces 20" unit formerly listed at this location.
(h) Additional acre-feet diverted: November 3.
(i) Formerly listed as 1-14", 2-16" and 1-20" units.
(j) Additional acre-feet diverted: November 93 and December 46.
(k) Additional acre-feet diverted: November 199 and December 367.
(l) Additional acre-feet diverted: November 7 and December 26.
(m) Plant is on Willow Creek at SW corner Section 33, T. 19 N., R. 2 W.
(n) Additional acre-feet diverted: December 12.
(o) See plant, Sacramento River, Mile 154.8R.
(p) Additional acre-feet diverted: November 46 and December 6.
(q) Formerly listed as Henry Jameson Estate.
(r) Additional acre-feet diverted: November 21.
(s) Works on Drain #55 and are in $SW\frac{1}{4}$ $NW\frac{1}{4}$ Section 86, Glenn Ranch Survey.
(t) Additional acre-feet diverted: November 2380.
(u) Works on Drain #13 and are in $SW\frac{1}{4}$ $SW\frac{1}{4}$ Section 51, Glenn Ranch Survey.

TABLE 144

DIVERSIONS AND ACREAGES IRRIGATED - BACK BORROW PIT*- 1949

Water User	**Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
River Farms Company	0.3L	1-10" 1-20"				NO DIVERSION							
--KNIGHTS LANDING RIDGE CUT JUNCTION - MILE 0.4R													
John J. Anderson	1.45R	2-16"		413	441	353	119	401	133		1860		298
Earl L. Wallace and Cecil Hulse	3.4R	1-16"				NO DIVERSION							
John C. Cooling	3.8R	1-16"		45	820	519	351	663	278		2676		300
W. Crawford	4.35R	1-20"			779	968	456	1070	648	3	(a)3924		(b)310
Cornelia Walker (Heidrick Bros.)	7.2R	1-8" 2-16"		61	215	243	149	257	84		1009		250
George E. Youngmark	8.8R	1-14" 1-16"		69	1069	592	416	725	8		2879		400
Hershey Estate	11.15R	1-14" 1-16"		95	2085	1764	1169	1934	177		(c)7224		800
Hershey Estate	13.75R	1-16"				NO DIVERSION							
C. M. Mumma	14.75R	1-10"		11	178	135	80	171	38		613	100	50
--COUNTY LINE BRIDGE - MILE 15.25--													
M. T. Emmert	15.75R	1-12"		113	479	426	399	374	128		1919		350
Kate West (H. B. West & Son)	18.1R	1-15" 1-20"		302	757	614	653	561	34		2921		590
William West	20.0R	1-15"			495	517	574	486	39		2111		330
--RECLAMATION DISTRICT 108 GRAVITY DRAIN - MILE 20.2L--													
Reclamation District 108 (d)	20.2L	1-16" 1-24" 1-30"		930							930	(e)	(e)
Gregory Estate	21.35R	1-15"				NO DIVERSION							
Bean and Brandenburg	22.15R	(f)1-12"			581	330	257	246	66		1480		130
Aileen B. Armstrong	22.65L	1-16" 1-20"				NO DIVERSION							
--GAGING STATION NEAR COLLEGE CITY - MILE 22.7--													
Herman Kalfsbeek (d) (.10W)	22.75R	1-16"			366	306	297	295	111		1375		120
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 23.0--													
H. H. Balsdon	24.6L	2-16" 1-20"		84	1531	1345	1782	1417	87	18	(g)6264	500	1000
Yates, Traynham, Balsdon	24.61R	2-16"		140	464	433	717	690	251		2695		410
A. M. Dobrosky and Henry Olin	24.7L	1-12"				NO DIVERSION							
Fred Kleeman (d)	25.1R	1-10"			208	225	197	262	102		994		100
Gertrude M. Sherer (Mrs.)	25.3L	1-16"				54	56	16			126	97	
Gertrude M. Sherer (Mrs.)	25.5R	1-10"			7	1	7	9			24	40	
--GRIMES-COLLEGE CITY CAUSEWAY - (SOUTH LINE OF R.D. 2047) - MILE 25.5--													
Fred Schutz	25.9L	1-16" 1-20"		322	1525	1321	1795	1363	142		(h)6468	175	1100
C. W. and M. E. Struckmeyer	27.25L	(i)1-16" 1-20"			12	254	377	259			902	210	
William P. Wallace Ranch	28.0R	1-12" 1-14" 1-16"			909	1076	1001	740	570		4296		350
--WALLACE CROSSING - (OLD MERIDIAN-WILLIAMS BRIDGE) - MILE 29.2--													
Sebia Davis Estate	29.8R	(j)1-16"		1	568	515	420	460	71		2035		180
A. Davis Estate	31.5L	1-24"			249						249	(k)	(k)
A. Davis Estate (d)	32.1R	2-18"			972	1097	1069	1070	303		4511		750
Federal Fish & Wild Life (l)	32.6R	1-16"			234	478	428	427	440	674	(m)2681		(n)245
J. G. Olvey	32.7L	1-14"			108	60	183	14	167		532	150	
Andrew Arata and (o) Fred Wilkins	33.5L	(p)1-12" 1-16"			448	629	495	588	354	250	(q)2764		300
Ord Leachman	34.25L	1-12"				PLANT REMOVED							
Federal Fish & Wild Life Service	36.65R	1-15" 1-20"			791	632	687	680	783	471	(r)4044		(s)640
Federal Fish & Wild Life Service	37.0L	1-15"				NO DIVERSION							
--COLUSA-WILLIAMS HIGHWAY - GAGING STATION - MILE 37.0--													
Totals			0	2586	16291	14887	14134	15178	5014	1416	69506	1272	9003
Average cubic feet per second			0	43	265	250	230	247	84	23	143		
Monthly use in per cent of seasonal			0	3.8	23.4	21.4	20.3	21.9	7.2	2.0			

* Carries return water from Colusa Basin along west border of Reclamation Districts 108 and 787 and thence to discharge to Sacramento River at Knights Landing or partial diversion via Knights Landing Ridge Cut.

** Mileage along Borrow Pit from Outfall Gates just above junction of Borrow Pit with Sacramento River at Knights Landing.

(a) Additional acre-feet diverted: December 425.
(b) A portion of this re-used for Gun club.
(c) Additional acre-feet diverted: December 97.
(d) New installation, 1949.
(e) See plant, Sacramento River, Mile 63.2R.
(f) Replaces 12" and 14" units formerly listed at this location.
(g) Additional acre-feet diverted: November 10.
(h) Additional acre-feet diverted: November 10.
(i) Operated 16" unit only in 1949.
(j) New unit installed in 1949, and replaces 14" unit previously listed at this location. The 14" unit is now used for drainage.
(k) See plant, Sacramento River, Mile 78.8R.
(l) Formerly listed as Wallace Lynn.
(m) Additional acre-feet diverted: November 664.
(n) All Duck club lands.
(o) Formerly listed as Mike O'Hair
(p) New unit added in 1949.
(q) Additional acre-feet diverted: December 134.
(r) Additional acre-feet diverted: November 676.
(s) All duck refuge lands.

TABLE 145

DIVERSIONS AND ACREAGES IRRIGATED - KNIGHTS LANDING RIDGE CUT - 1949

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
E. L. Wallace	0.8R	1-16" 1-20"		1658	1576	3336	852	3261	408		11091	260	550
M. R. Richardson	0.82L	1-14"				NO DIVERSION							
Ralph W. Pollock	3.5L	1-12"					11	12			23	(a)150	
--RECLAMATION DISTRICT 730 DRAIN PLANT #2 - MILE 3.8--													
Kenneth Lowe	4.5R	1-20"				PLANT REMOVED							
Ralph W. Pollock	4.55L	1-12"				58	86	55			199	(b)	
Hershey Estate	4.7L	1-15"				NO DIVERSION							
John Seiber	4.7R	1-6"				19	15	2			36	20	
Layton D. Knaggs	5.25R	(c)1-16"		206	253	521	210	61	161		1412		120
Henry Rich	5.9L	1-10" 1-12"				PLANT REMOVED							
--WEST LEVEE YOLO BY-PASS - MILE 6.3--													
Henry Rich	6.3R	Gravity		698	1969	1905	1969	1968	952		9461	450	550
E. L. Wallace	6.3R	Gravity				NO DIVERSION							
Totals			0	2562	3798	5839	3143	5359	1521	0	22222	880	1220
Average cubic feet per second			0	43	62	98	51	87	26	0	46		
Monthly use in per cent of seasonal			0	11.5	17.1	26.3	14.2	24.1	6.8	0			

* Mileage downstream from head on Back Borrow Pit near Knights Landing. Flow is principally Colusa Basin drainage diverted to the Ridge Cut by checking at the Knights Landing Outfall Gates on the Back Borrow Pit of Reclamation District 787. See Table 54

(a) Combined acreage, this plant and one at Mile 4.55L.
(b) See plant at Mile 3.5L.
(c) Formerly listed as a 14" unit.

TABLE 146

DIVERSIONS AND ACREAGES IRRIGATED - YOLO BY-PASS (EAST BORROW PIT OR TULE CANAL) - 1949

Water User	**Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
T. S. Glide	*2.0S	1-20"				NO DIVERSION							
Robert Swanston	*1.8S	1-16"				NO DIVERSION							
Robert Swanston	*1.1S	(a)1-20"			521	1681	898	1445	1107		5652		480
Robert Swanston	*0.7S	1-16"				NO DIVERSION							
Robert Swanston	0.1S	1-16"		342	437	798	405	605	277		2864		450
--NORTH LEVEE SACRAMENTO BY-PASS - RECORDING GAGE - MILE 0.0--													
Robert Swanston	*1.8N	2-20"				NO DIVERSION							
Ensher, Alexander & Barsoom	2.4N	1-20"			567	784	410	614	215		(b)2590	530	
Ensher, Alexander & Barsoom	3.4N	1-8"				NO DIVERSION							
Ralph Aitken	5.9N	1-12"				NO DIVERSION							
--SACRAMENTO-WOODLAND HIGHWAY - MILE 6.18--													
--SACRAMENTO-WOODLAND RAILROAD CROSSING - MILE 6.2--													
--CACHE CREEK - MILE 7.0N--													
Frank Newman	*7.0N	1-16"				NO DIVERSION							
--RECLAMATION DISTRICT 1600 DRAINAGE PLANT - MILE 10.0--													
--KNIGHTS LANDING RIDGE CUT - MILE 10.1R--													
Fisher and Rich	*10.0N	1-14" (c)1-16"			136	426	224	264	172		1222	330	
Henry Rich	10.3N	2-12"				NO DIVERSION							
Totals			0	342	1661	3689	1937	2928	1771	0	12328	860	930
Average cubic feet per second			0	6	27	62	32	48	30	0	25		
Monthly use in per cent of seasonal			0	2.8	13.5	29.9	15.7	23.8	14.3	0			

* Asterisk indicates that land irrigated is within By-Pass area.
** Mileage is given northerly or southerly from North Levee of Sacramento By-Pass. Diversions from East Borrow Pit of Yolo By-Pass are primarily from water diverted through Knights Landing Ridge Cut. See Table 53

(a) Replaces 12" unit formerly listed at this location.
(b) Also received water from wells.
(c) 16" unit removed in 1949.

TABLE 147

DIVERSIONS AND ACREAGES IRRIGATED - DELTA UPLANDS FROM CACHE SLOUGH - 1949

Water User	Location	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Reclamation District #2068	SW¼ NE¼ Sec.34 T6N, R1E.	1-36" 2-30"		2453	6132	6976	8621	7155	6850	5227	(a)43414	7400	800
Totals			0	2453	6132	6976	8621	7155	6850	5227	43414	7400	800
Average cubic feet per second			0	41	100	117	140	116	115	85	89		
Monthly use in per cent of seasonal			0	5.6	14.1	16.1	19.9	16.5	15.8	12.0			

(a) Additional acre-feet diverted: November 1878.

TABLE 148

DIVERSIONS AND ACREAGES IRRIGATED - LOWER BUTTE CREEK AND BUTTE SLOUGH - 1949

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--SACRAMENTO RIVER JUNCTION - MILE 0.0--					Lower Butte Creek								
--BUTTE SLOUGH - MILE 0.1--													
Reclamation District #833	(a) 3.3L	1-36" box (b)1-16"			4	266	320	458			1048	600	
West Butte Farms Company	(c) 4.25L	(d)1-18"			312	474	581	583	15		1965	500	200
Reclamation District #1004	(e) 4.3R	1-20" 1-24"			3298	2780	2818	3870	1046		(f)13812	(g)	(g)
Butte Lodge Outing Club	(h) 4.4R	1-22"				NO DIVERSION							
El Anzar Duck Club	(i) 5.7L	1-12"				30	44				74	30	
Field and Tule (j)	8.2L	1-16"			480	460	450	810	70		2270		465
Butte Basin Gun Clubs	(k)11.7L	Gravity								4200	(l)4200	(m)4200	
Reclamation District #1004	(n)11.8R	(o)1-60"		1500	3500	2900	2900	2500	800	1000	(p)15100	(q)	(q)
White Mallard Duck Club	(r)11.8R	1-36" Gravity				NO DIVERSION							
White Mallard Duck Club	(s)11.8R	(t)1-12" 1-16"		85	184	420	362	505			(u)1556		(v)150
Reclamation District #1004	(w)14.4R	Gravity		800	1800	1100	1100	1100	400	500	(x)6800	(q)	(q)
Murdock Land Company	14.4L	(y)1-12" 1-14"			49		68	26			(z) 143	80	
--GRIDLEY ROAD - MILE 15.4--													
Murdock Land Company	19.3R	1-14"		87	25	111	114	142	103	27	(aa) 609	(bb)135	
--BIGGS-AFTON ROAD - MILE 19.4--													
Glenn Rice Farms	(cc)20.7R	1-18"			78	103	43	104		24	(dd) 352	(ee)230	
H. W. McGowan (ff)	20.9R	1-16"		280	308	217	229	475			1509		120
H. W. McGowan	21.0R	1-16" (b)1-20"		607	270	782	666	551			2876		300
A. H. Hulen	21.4R	1-16"		271	316	241	230	270		33	(gg)1361		(bb)110
--RICHVALE BUTTE CITY ROAD - MILE 22.5--													
McGowan Ranch	23.0R	2-16"		1026	1157	1597	1864	2731	484		8859		530
Butte Slough Irrigation Co.	0.3W	Gravity			Butte Slough						(hh)	(ii)	(ii)
M. Marty	0.3W	1-12"			48	73	59	47	93	38	358	125	
George Smith (j)	.9E	1-7"			67	152	160	51			430	(jj)260	
George Smith (kk)	1.4E	1-8"				58	106	67			231	(ll)	
--MAWSON BRIDGE - MILE 2.1--													
C. W. Rawley	2.5W	(mm)1-14"			54	42	48	50	47		241	110	
J. E. Smith	3.0W	1-10"				17	163	37	35		252	88	
Pearl Clark and Alice Brewer	(nn)3.5W	1-10"			23	31	53	28	23		158	113	
P. A. Reische	3.7W	1-10"			2	1	1				4	35	
Granniman and Feiths	4.08W	1-6"			2		1				3	3	
P. A. Reische	4.1W	1-10"		14	10	109	54	53			240	193	
E. V. Jacobs Estate	4.8W	1-10"		12	26	92	24	51			205	274	
P. B. Hensen and Hankins	5.1W	1-12"		28	123	112	137	89	77	12	578	160	
T. J. Hageman	6.8W	3-8"				PLANT REMOVED							
Totals (Lower Butte Creek and Butte Slough)			0	4710	12136	12168	12595	14598	3193	5834	65234	7136	1875
Average cubic feet per second			0	79	197	205	205	237	54	95	134		
Monthly use in per cent of seasonal			0	7.2	18.6	18.7	19.3	22.4	4.9	8.9			

* Approximate mileage from junction with Sacramento River.
(a) Formerly listed as 2.9L.
(b) New unit added in 1949.
(c) Formerly listed as 3.85L.
(d) Replaces 20" unit formerly listed at this location.
(e) Formerly listed as 3.9R.
(f) Additional acre-feet diverted: December 130.
(g) See plant, Sacramento River, Mile 89.255L.
(h) Formerly listed as 4.0R.
(i) Formerly listed as 5.35L.
(j) New installation in 1949.
(k) Formerly listed as 10.0L.
(l) Additional acre-feet diverted: November 4200 and December 4200.
(m) Gun club lands.
(n) Formerly listed as 9.3R.
(o) Formerly listed as 48".
(p) Includes 1000 acre-feet in October for gun clubs and additional acre-feet diverted: November 2000 and December 2000.
(q) See plant, Sacramento River, Mile 112.1L.
(r) Formerly listed as 10.2R.
(s) Formerly listed as 13.2R.
(t) Replaces 24" unit formerly listed at this location.
(u) Additional acre-feet diverted: November 3 and December 290.
(v) Re-used for gun clubs.
(w) Formerly listed as 13.2R.
(x) Includes 500 acre-feet for gun club in October and additional acre-feet diverted: November 600 and December 600.
(y) 12" unit removed in 1949.
(z) Additional acre-feet diverted: November 22.
(aa) Additional acre-feet diverted: November 19.
(bb) A portion of this acreage re-used for gun club.
(cc) Plant moved from 20.4 to 20.7R.
(dd) Additional acre-feet diverted: November 13 and December 58.
(ee) Includes 30 acres gun club lands.
(ff) Re-installation at old point of diversion.
(gg) Additional acre-feet diverted: November 61.
(hh) Flow in Butte Slough, derived from Butte Creek, is controlled by Outfall Gates at its junction with Sacramento River and is thereby retained in Butte Slough to discharge into East and West Borrow Pits of Sutter By-Pass near "Long Bridge". The Outfall Gates are maintained by the Division of Water Resources and are cooperatively operated with the Butte Slough Irrigation Company. See Sutter By-Pass Diversions, Table
(ii) See acreages under rediversion--West Borrow Pit Sutter By-Pass. A considerable additional but indeterminate acreage was served by sub-irrigation and direct diversions from flow diverted to East Borrow Pit of Sutter By-Pass which is joined by Feather River return flow entering via Wadsworth Canal, Table See East Borrow Pit Sutter By-Pass Diversions, Table
(jj) Combined acreage for plants at this Mile and Mile 1.4E.
(kk) Formerly listed as G. S. and D. C. Smith Estate.
(ll) See plant at Mile .9E.
(mm) Formerly listed as a 12" unit.
(nn) Formerly listed as I. E. Nall Estate.

TABLE 149

DIVERSIONS AND ACREAGES IRRIGATED - SUTTER BY-PASS AND SACRAMENTO SLOUGH - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet							Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
(a)				West Borrow Pit of Sutter By-Pass									
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 2.5--													
C. Fred Holmes (b)	8.0R	1-18"			756	756	276	655	305		2748		267
--KNIGHTS LANDING-MARYSVILLE CAUSEWAY - MILE 12.7--													
Sutter Basin Corp. Ltd. (c)	8.5R	1-18"		408	722	721	355	1012			3218		312
--SOUTH LEVEE TISDALE BY-PASS - MILE 18.9													
--RECLAMATION DISTRICT 1660 GRAVITY - MILE 19.3--													
G. Guisti	23.7R	(d)1-24"		860	1067	998	625	1958	242		5750		600
Butte Slough Irr. Co. Ltd.	25.0R	1-30" Gravity		9	110	95	89	63	6		372	(e)4739	(e)270
Butte Slough Irr. Co. Ltd.	28.4R	Gravity		1129	2107	2134	2251	2325	820		10766	(f)	(f)
Fred Tarke	28.6R	1-12"				8	78				86	53	
Frye Brothers	29.0R	1-7"				NO DIVERSION							
--NEW COLUSA-MARYSVILLE HIGHWAY - MILE 29.1--													
--NORTHERN ELECTRIC RAILROAD CROSSING - MILE 29.15--													
(g)				East Borrow Pit of Sutter By-Pass									
R. E. Hughes	*0.9S	(h)2-16"			787	542	983	709	274		3295	250	200
R. E. Hughes	*0.5N	(i)1-14" 1-16"		24	602	498	557	550	138		2369	180	100
Cliff P. Childers	(j) 1.4N (0.3)	1-16"				NO DIVERSION							
Cliff P. Childers	(j) 1.4N (1.3)	1-16"		188	702	558	197	205	159		2009		270
E. H. Christensen & Sons	(j) 1.4N (1.3)	1-16"		75	638	495	426	374	238		2246		(k)600
E. H. Christensen & Sons	(j) 1.4N (1.75)	(l)1-16"		283	729	597	588	471	255		(m)2923		400
E. H. Christensen & Sons	(j) 1.4N (3.3)	(n)1-16"		206	421	570	214	366	190		1967		220
E. H. Christensen & Sons	(j) 1.4N (3.3)	1-12"			271	273	368	287	199		1398		(o)
E. H. Christensen & Sons	(j) 1.4N (4.0E)	1-18"				NO DIVERSION							
R. E. Hughes #6	*1.5N	1-14"				112	167	6			285	400	
R. E. Hughes #5	*2.9N	1-14"			180	629	759	412	193		2173	(p)300	(p)320
R. E. Hughes #4	*4.0N	1-14"			615	587	739	577	252		2770	(q)	(q)
R. E. Hughes #3	*4.5N	1-14"					56				56	(r)50	
Ira Mulligan	*5.7N	1-16"				130	167	179		133	609	(s)150	
R. E. Hughes #2	*5.9N	(t)1-10" 1-14"		208	655	391	609	489	72		2424	200	200
O. O. Orrick	*7.1N	(u)1-6" 1-16"				89	483	49			621	412	
Ira Mulligan	7.1N	1-16"		50	640	536	704	678	320		2928		250
R. E. Hughes (b)	*8.0N	1-6"					27				27	180	
Crepps and Middleton	*8.4N	1-12" 1-16"				NO DIVERSION							
--RECLAMATION BOARD DRAINAGE PLANT #2 - MILE 10.0N--													
Crepps and Middleton	(v) 10.0N (8.6N)	1-18"				NO DIVERSION							
Martin Gun Club	*10.0N	(w)1-16"					114	46	199	58	(x)417	(y)350	
Crepps and Middleton (b)	*10.0N	1-15"		101	215	249	276	245	201		1287	150	80
Mrs. E. P. Reddington (b)	*11.5N	1-15"			307	369	381	381	256		1694		200
Sutter Home Investment Co.	*12.0N	1-12"				NO DIVERSION							

* Asterisk indicates area irrigated is within By-Pass area.
(a) Mileage is given northerly from drainage plant of Reclamation District 1500. Mile 9.15 West Borrow Pit is opposite Chandler.
(b) New installation, 1949.
(c) Formerly listed as Reclamation District 1500.
(d) Replaces 16" unit formerly listed at this location.
(e) Combined acreage for plants at this Mile and Mile 28.4R.
(f) See plant at Mile 25.0R..
(g) Mileage is given northerly or southerly from Chandler.
(h) New 16" unit installed, 1949.
(i) 14" unit removed during 1949.
(j) Plant is on drain canal which enters By-Pass at this point. Figure in () indicates distance along drain from By-Pass.
(k) Combined acreage for plants at this Mile and Mile 1.4N (3.3).
(l) Replaces 15" unit formerly listed at this location.
(m) Additional acre-feet diverted: December 28.
(n) Formerly listed as 15" unit.
(o) See plant at Mile 1.4N (1.3N).
(p) Combined acreage this plant and one at 4.0N.
(q) See plant at 2.9N.
(r) Partially irrigated.
(s) Portion of land flooded in October.
(t) 10" unit removed in 1949.
(u) Operated 16" only in 1949.
(v) Figure in () indicates distance up intake canal from By-Pass.
(w) Replaces 12" unit formerly listed at this location.
(x) Additional acre-feet diverted: November 18.
(y) All gun club lands.

TABLE 149 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SUTTER BY-PASS AND SACRAMENTO SLOUGH - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
(a)						East Borrow Pit of Sutter By-Pass (Continued)							
Federal Fish and Wildlife Service	*16.3N	1-20"		384	768	768	768	768	384		3840		480
Fred S. Betty	(b) 16.5N (1.0R)	1-10"		52	49	61	41	99	2	13	(c) 317	65	
F. H. Ziegenmeyer	(b) 16.5N (1.35R)	1-12"		117	188	192	93	315	44		(d) 949		80
A. H. Muns	(b) 16.5N (1.36R)	1-12"		274	525	425	199	697	146		(e)2266		(f)250
C. C. Epperson (g) et al	(b) 16.5N (h) (2.5R)	1-10" (i)1-14"		765	888	100	304	1171	360		3588		260
Youill Joaquin	(b) 16.5N (3.0L)	1-10"				NO DIVERSION							
Gilbert Williamson	(b) 16.5N (3.6R)	1-10"		103	123	160	26	191	69	63	(j) 735	155	
Fred S. Betty (k)	(l) 16.5N (0.9N)	1-8"		75	136	115	101	117	120		(m) 664		(n) 75
Fred S. Betty	(l) 16.5N (1.1N)	1-10" 1-16"				PLANT REMOVED							
Mrs. H. C. and C. H. Epperson	(l) 16.5N (1.5E)	1-16" 1-20"		805	818	816	975	1034	251		(o)4699		240
D. Meyers, et al (k)	16.5N (1.6E)	1-16"		260	417	376	337	339	91		1820		(p)310
Meyer, Platter, Moorehead, DeWitt Bros, Epperson and Middleton	19.1N	1-14"			250	419	548	231			1448	549	
--NEW COLUSA MARYSVILLE HIGHWAY - MILE 19.98N--													
--NORTHERN ELECTRIC RAILROAD CROSSING - MILE 20.0N--													
						Sacramento Slough (q)							
C. F. Holmes	0.5R	1-12"				NO DIVERSION							
C. F. Holmes	1.4R	1-12"		73	595	764	588	578	209		2807	120	200
Totals			0	6449	16281	15533	15469	17577	5995	267	77571	8303	6184
Average cubic feet per second			0	108	265	261	252	286	101	4	160		
Monthly use in per cent of seasonal			0	8.3	21.0	20.0	20.0	22.7	7.7	0.3			

* Asterisk indicates area irrigated is within By-Pass area.
(a) Mileage is given northerly or southerly from Chandler.
(b) Plant is on Wadsworth Canal which enters By-Pass at this point. Figure in () indicates distance up canal from By-Pass.
(c) Additional acre-feet diverted: November 18.
(d) Also furnishes some water to plant at 16.5N (1.36R).
(e) Receives some water from plant at 16.5N (1.35R).
(f) Also served by wells.
(g) Formerly listed as C. C. Epperson.
(h) Formerly listed as 16.5N (1.1L).
(i) New 10" and 14" units replace 10" formerly listed at this location.
(j) Additional acre-feet diverted: November 24.
(k) New installation, 1949.
(l) Plant is on Poodle Creek which enters By-Pass at this point. Figure in () indicates distance along creek from By-Pass.
(m) Additional acre-feet diverted: November 28 and December 25.
(n) Includes 25 acres gun clubs.
(o) Furnish some water to plant at Mile 16.5 (1.6E).
(p) Received some water from plant at Mile 16.5N (1.5E).
(q) Mileage is given easterly from drainage plant of Reclamation District 1500 which is at head of slough.

TABLE 150

DIVERSIONS AND ACREAGES IRRIGATED - FEATHER RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Walter Raymond	0.6R	1-20"			502	649	819	986	421		3377	(a)1245	(a)850
Walter Raymond	2.60R	(b)2-20"			586	900	1185	1131	298		4100	(c)	(c)
Johnston Bros.	3.0L	1-10"					79	39	35		153	160	
Marie Van Antwerp (d)	5.6L	(e)1-14"			20	61	37	20			138	80	
A. L. Haymore	6.44L	1-10"		141	104	117	97	110	117	33	719	155	
M. Scheiber	7.7L	1-10"			120	178	185	217	175	36	911	245	
--NICOLAUS GAGING STATION - MILE 9.3--													
--NICOLAUS BRIDGE - MILE 9.4--													
T. H. Richards	9.75R	1-20"		49	395	251	218	93	195	492	(f)1693	205	
--MOUTH OF BEAR RIVER - MILE 12.0L--													
Garden Highway Mut. W. Co.	13.1R	1-20" (g)1-24"		785	2793	3894	2566	1850	1217		13105	1474	1236
Farm Lands Co.	17.5L	1-15" 1-20"		219	487	857	620	1753	880	535	5351	1260	
Oswald Water District	21.4R	(h)2-16"		343	708	1082	744	525	663	582	(i)4647	608	
--SHANGHAI BEND - MILE 23.0--													
Hamilton, Broberg and Stuart	25.2R	1-10"			72	81	31	38			222	127	
--MOUTH OF YUBA RIVER - MILE 27.3L--													
--FIFTH STREET HIGHWAY BRIDGE - MILE 28.0--													
--TENTH STREET HIGHWAY BRIDGE - MILE 28.2--													
A. C. Rackerby	32.3R	(j)1-4" 1-10"				41	36	17			94	80	
G. D. Prindiville	33.3R	1-10"		11	66	157	131	54	28		447	144	
J. L. Sullivan, Jr.	33.9R	1-10"		69	76	191	105	24	3		468	195	
Sutter Butte Canal Co. (Sunset Plant)	38.1R	1-26" 2-42"		1514	277	822	2056	2205	173		7047	(k)	(k)
Matthews, Sullivan and Prindiville	(l) 43.7L(0.4L)	1-18"		82	145	372	271	102	15		987	286	
Mat. Thomes	(l) 43.7L(1.2L)	1-8"		2	40	18	56	11			127	63	
Ray Washburn	(l) 43.7L(1.25L)	1-8"			21	14	58	24	34	18	(m)169	65	
W. Earl Willey	44.5R	1-7"				12	10	11			33	27	
Arnold Christenson	46.3L	1-24"		63	303	1450	1824	904	443		4987	1130	
A. P. Barba	47.4L	1-7"			8	8	12	4			32	50	
A. P. Barba	47.9L	1-12"			183	43	143	103	87	31	590	300	
Robert S. Biggs	48.3L	1-10"					140	36	63		239	205	
Edward Dunning	49.0L	1-8"		34	34	83	12	13			176	76	
--GRIDLEY BRIDGE GAGING STATION NEAR GRIDLEY - MILE 49.7--													
Frank E. Norton (n)	51.0R	1-6"		5	20	25	32	5	11		98	34	
M. A. Pedroza and Sons	51.1L	1-6"		29	70	86	46	64	29	13	(o)337	62	
Steadman Orchards	51.4R	1-10"				164	71				235	82	
Tony Bettencourt (p)	51.6L	1-6"		8	23	64	23	14			132	100	
Capital Company	51.6R	1-6"			2	34	14				50	35	
J. F. Fratus	52.1L	1-10"			36	48	59	32	1		176	65	
Arthur Starr	52.5L	1-10"				36	20	36			(q) 92	65	
F. L. Morris	52.7L	1-8"			30	20	15				65	49	
Ruby Chambers (r)	53.1R	1-6"		20	3	26	12	3	6		70	30	
Hearst Estate	55.1L	1-14"		21	163	330	205	291	179	82	1271	281	

(a) Combined acreage for this plant and Mile 2.6R.
(b) New 20" unit added in 1949.
(c) See plant at Mile 0.6R.
(d) Formerly listed as Ralph Taylor
(e) Replaces 10" unit formerly listed at this location.
(f) Additional acre-feet diverted: November 46.
(g) New 24" unit installed in 1949.
(h) One 16" unit installed in 1949.
(i) Additional water received from wells.
(j) The 4" temporary unit removed in 1949.
(k) See plant at 58.1R.
(l) Plant diverts Feather River water backed into Honcut Slough, Mouth of Slough at Mile 43.7L. Distance from Feather River up Slough shown in ().
(m) Additional acre-feet diverted: November 8.
(n) Formerly listed as Frank R. Norton.
(o) Additional acre-feet diverted: November 1.
(p) New installation, 1949.
(q) Additional acre-feet diverted: November 6.
(r) Formerly listed as Ruby Chambers (Mrs.).

TABLE 150 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - FEATHER RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Henry Hazelbusch	57.9R	1-9"		13	35	37	51				136	48	
Sutter Butte Canal Co.	(a)58.1R	Gravity		20566	48485	44393	41971	38624	20827	15828	(b)230694	17107	8718
Biggs-West Gridley Water Dist.	(a)58.1R	Gravity		12698	29936	27409	25914	23847	12859	9773	(c)142436	3598	7049
Richvale Irr. Dist.	(a)58.1R	Gravity		12086	28493	26087	24665	22698	12239	9302	(d)135570	435	12152
Western Canal Company	59.7R	Gravity		8638	32106	31238	33289	30855	8329	10675	(e)155130	851	21126
--OROVILLE BRIDGE - MILE 65.0--													
--U.S.G.S. GAGING STATION - MILE 71.0--													
Totals			0	57396	146342	141278	137822	126739	59327	47400	716304	31022	51131
Average cubic feet per second			0	965	2380	2374	2241	2051	997	771	1474		
Monthly use in per cent of seasonal			0	8.0	20.4	19.7	19.2	17.8	8.3	6.6			

(a) This is a common point of diversion for the Sutter-Butte Canal Company, Richvale Irrigation District and the Biggs-West Gridley Water District. Diversions are reported separately. Sutter-Butte Canal Company operated a plant at Mile 38.1R.
(b) Additional acre-feet diverted: November 3993.
(c) Additional acre-feet diverted: November 2466.
(d) Additional acre-feet diverted: November 2347.
(e) Additional acre-feet diverted: November 3681, December 9479 used for gun club. Includes 10515 acre-feet in October for gun club.

TABLE 151

DIVERSIONS AND ACREAGES IRRIGATED - YUBA RIVER - 1949

Water User	Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Fset	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--HIGHWAY 99E (D STREET BRIDGE) - MILE 0.0--													
--YUBA RIVER AT MARYSVILLE - GAGING STATION AT SEVENTH STREET BRIDGE - MILE 0.9--													
C. Wesley Reed (a)	0.9L	1-10"				75	50	75			200	50	
Ben Williams	1.4R	1-4"				4	2	2	1		9	5	
M. Lively	1.6L	1-10"				NO DIVERSION							
W. B. Harrington	1.8R	1-6"				83	95	19	56		253	60	
W. B. Harrington	2.6L	(b)1-4" 1-5"				24	2	11	1	9	47	18	
Bill Wolfe	3.0L	1-10"				288	158	217			663	100	
E. O. Rubke	4.1L	1-14"			79	83	60	120	80	2	424	(c)300	
E. O. Rubke	4.3L	1-10"		5	44	23	20	63	40		195	(d)	
Di Giorgio Fruit Corp.	4.75L	1-6"					29				29	72	
Scott Hendricks	6.2L	1-10"		60	3		56				119	165	
Cordua Irrigation District	11.0R	Gravity		3632	6692	5980	6581	6230	4883	5165	(e)39163	3213	1625
Hallwood Irrigation District	11.0R	Gravity		5365	12115	10728	12363	11153	8277	5744	65745	4855	1675
Yuba Consolidated Gold Field Co.	14.5L	Gravity				NO AGRICULTURAL USE							
Totals			0	9062	18933	17288	19416	17890	13338	10920	106847	8838	3300
Average cubic feet per second			0	152	308	291	316	291	224	178	220		
Monthly use in per cent of seasonal			0	8.5	17.7	16.2	18.2	16.7	12.5	10.2			

* Mileages listed are miles above Highway 99E (D Street Bridge).
(a) New installation, 1949.
(b) New unit installed in 1949.
(c) Combined acreage this plant and one at Mile 4.3L.
(d) See plant at Mile 4.1L.
(e) Additional acre-feet diverted: November 4737 and December 4389.

TABLE 152

*DIVERSIONS AND ACREAGES IRRIGATED - BEAR RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--MARYSVILLE-NICOLAUS COUNTY ROAD BRIDGE - MILE 5.5--													
--TROW BRIDGE TO WHEATLAND COUNTY ROAD BRIDGE - MILE 8.4--													
Whitney Warren	9.2R	1-8"			17	17					34	80	
W. H. Gilbert	10.0R	1-6"			11	10					21	100	
California Packing Corp.	11.1L	1-10"		29	51	36	23				139	(a)685	
C. W. Stineman	11.4R	1-6"		9	15	19	19				62	109	
California Packing Corp.	12.4L	1-10"		29	51	36	23				139	(b)	
--HIGHWAY 99E BRIDGE - MILE 13.0--													
--S.P. RAILROAD BRIDGE - MILE 13.05--													
Totals			0	67	145	118	65	0	0	0	395	974	
Average cubic feet per second			0	1	2	2	1	0	0	0	1		
Monthly use in per cent of seasonal			0	17.0	36.7	29.9	16.4	0	0	0			

* Records of use are partially estimated for 1949.
(a) Combined acreage this plant and one at Mile 12.4L.
(b) See plant at Mile 11.1L.

TABLE 153

DIVERSIONS AND ACREAGES IRRIGATED - AMERICAN RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--GARDEN HIGHWAY BRIDGE - MILE 0.2--													
--AUBURN BOULEVARD BRIDGE - 16th STREET - MILE 1.9--													
--SACRAMENTO NORTHERN RAILROAD BRIDGE - MILE 2.0--													
--WESTERN PACIFIC RAILROAD BRIDGE - MILE 2.1--													
Sacramento Stucco Company	2.4L	1-5"			5	9	5	3			22	12	
North Sacramento Lands Co.	2.55R	1-6"				NO DIVERSION							
North Sacramento Lands Co.	2.65R	1-7"					14				14	100	
North Sacramento Lands Co.	2.75R	1-5"			2	1	3	2	1		9	14	
--SOUTHERN PACIFIC RAILROAD BRIDGE - MILE 3.5--													
C. Swanston & Sons	4.2R	1-10"			61	13					74	20	
C. Swanston & Sons	5.3R	1-10"			95	25	70	30			220	78	
--GAGING STATION - AMERICAN RIVER AT SACRAMENTO - MILE 6.1--													
E. Clemens Horst Co.	6.5R	1-6"				51	46				(a) 97	50	
E. Clemens Horst Co.	7.5R	1-8"				102	94				(a)196	100	
J. I. Haas, Inc.	7.8R	1-4"			1			44	33	3	81	50	
Hagginbottom Land Co.	8.05R	1-10"				PLANT REMOVED							
T. A. Farrell (b)	8.95R	1-4"		1	1	8	7	1	21	5	44	15	
J. H. Kerby	9.0L	1-6"				52	29	82			163	40	
G. L. Browning (b)	9.05R	1-6"							84	34	118	15	
Hagginbottom Land Co.	9.2R	1-12"				PLANT REMOVED							
J. G. and F. F. Dauenhauer	9.2L	1-8"			15	20	13	2			50	60	
Ruth Coleman (c)	9.35L	1-5"				NO DIVERSION							
Ruth Coleman (c)	9.5L	1-5"				NO DIVERSION							
Ruth Coleman (c)	9.55L	1-5"				NO DIVERSION							
Sweem Bros.	10.2R	1-8"		46	75	69	71	72	48	16	397	70	
Gold Nugget Orchard Co.	10.4R	1-5"			2	3	3				8	17	
Mucke Sand and Gravel Co.	11.2L	1-6"		11	9	18	20	14	7	6	85	35	
J. T. Gore	11.5L	1-4"				NO DIVERSION							
William A. Meyer	11.7L	1-4"			31	25	48	19	13	10	146	27	
H. T. Danielson	13.1R	1-5"			DOMESTIC USE ONLY								
Knapp Corporation	13.3R	1-4"			23	21	22	23	15		104	60	
C. W. Deterding and Mrs. May McDonnell	13.9R	1-6"					77	72	39		188	27	
J. R. Deterding	15.1R	1-4"			58	72	69	26	6	2	233	75	
Carmichael Irr. Dist.	16.0R	1-6" 2-12"			196	780	857	849	457	124	(d)3263	(e)3000	
A. I. Goddard	17.1R	1-6"				PLANT REMOVED							
--GAGING STATION - AMERICAN RIVER AT FAIROAKS - MILE 19.2--													
Totals			0	58	574	1269	1448	1239	724	200	5512	3865	
Average cubic feet per second			0	1	9	21	24	20	12	3	11		
Monthly use in per cent of seasonal			0	1.1	10.4	23.0	26.3	22.5	13.1	3.6			

(a) Additional water received from wells.
(b) New installation in 1949
(c) Formerly listed as Ruth Coleman (Mrs.).

(d) Additional acre-feet diverted: November 176 and December 359.
(e) Estimated irrigated suburban lands. No segregation of irrigated acreage available.

TABLE 154

DIVERSIONS AND ACREAGES IRRIGATED - COSUMNES RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--U.S. 50 AND 99 HIGHWAY BRIDGE - MILE 11.8--													
--GAGING STATION McCONNELL STATION - MILE 11.8--													
Alvin Bartholamew	14.3R	1-6"				NO DIVERSION							
Oliver A. Roden	14.9R	1-6"				NO DIVERSION							
J. C. Carli	15.1R	1-10"	56		19	19	2				96	20	
Thornton Colton	15.3R	1-12"				25					25	32	
D. M. Doyle	15.5R	1-6" 1-8"				NO DIVERSION							
William R. Saxon	16.0R	1-10"			60	60					(a)120	100	
Harvey Blodgett	16.4R	1-8"				13					13	28	
--CALIFORNIA TRACTION RAILROAD BRIDGE CROSSING - MILE 17.8--													
Joseph Audisio	20.5R	1-12"				NO DIVERSION							
Bright Estate (Mike Marinelli)	21.1R	1-15"		58	119	58					(a)235	383	
J. I. Haas	22.0R	1-12"				70	35				(a)105	70	
Rooney Brothers	24.6R	1-12"				74	74				(a)148	180	
W. Jared Sheldon	25.1R	1-8"		10	20	220	119				(a)369	156	
F. Morse Grimshaw	26.9R	1-8"		5	9	10	11	13	4		52	24	
A. V. Signorotti	27.1R	1-6"			3	7	5	5			20	13	
F. Morse Grimshaw	27.5R				4						4	10	
G. C. Johnson	29.4L	1-6"				NO DIVERSION							
G. C. Johnson	29.4L	1-6"				NO DIVERSION							
G. C. Johnson	29.9L	1-6" (b)1-8"				38	41	39			(a)118	115	
--STATE HIGHWAY SIXTEEN BRIDGE - MILE 32.2--													
Cosumnes River Water Dist.	33.5	Gravity		140	410	396	180				1126	660	
--GAGING STATION (MICHIGAN BAR) - MILE 34.3--													
Totals			56	213	644	990	467	57	4		2431	1791	
Average cubic feet per second			1	4	10	17	8	1			5		
Monthly use in per cent of seasonal			2.3	8.8	26.5	40.7	19.2	2.3	0.2				

(a) Additional water received from wells.

(b) Used 8" pump only in 1949.

TABLE 155

DIVERSIONS AND ACREAGES IRRIGATED - MOKELUMNE RIVER - 1949

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--GALT-THORNTON BRIDGE CROSSING - MILE 7.0--													
S. and J. Frandy	10.4L	1-12"	1	23	18	38	46	19			145	52	
Carolyn McCally Brovelli	10.6R	1-12"		20	75	80	106	106	70	70	527	110	
A. Taddei	15.6R	1-6"			30	48	41	23	17		159	53	
R. J. Lange	16.8R	1-6"				34	30	17			81	106	
W. and E. Selles	18.2R	1-6"			3	6	13	12	5		39	23	
B. M. Durrell	19.0R	1-6"				NO DIVERSION							
--GAGING STATION (NEAR) WOODBRIDGE - MILE 19.2--													
B. M. Durrell	19.4R	1-6"				NO DIVERSION							
--SACRAMENTO ROAD BRIDGE CROSSING - MILE 19.8--													
--WOODBRIDGE IRRIGATION DISTRICT DAM - MILE 19.9--													
Totals			1	43	126	206	236	177	92	70	951	344	
Average cubic feet per second				1	2	3	4	3	2	1	2		
Monthly use in per cent of seasonal				4.5	13.3	21.7	24.8	18.6	9.7	7.4			

* Mileage shown is approximate mileage from New Hope Bridge landing.

TABLE 156

DIVERSIONS AND ACREAGES IRRIGATED - CALAVERAS RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Charles Weber	4.1R	4-6"				NO DIVERSION							
--WESTERN PACIFIC RAILROAD CROSSING--	4.9												
--SOUTHERN PACIFIC RAILROAD CROSSING--	5.3												
--U.S. 50 AND 99 HIGHWAY CROSSING--	6.85												
--CENTRAL CALIFORNIA TRACTION CO. RAILROAD CROSSING--	7.9												
G. Pezzi (Dam)	11.8	4-18" Gravity			70	80					(a,b)150	150	
Pastori--Formati (Dam)	12.0	4-18" Gravity			60	80					(b,c)140	140	
--STATE HIGHWAY 88 CROSSING	12.3												
Clements Road Dam	20.0L	2-24" Gravity			80	90					(d)170	(e)170	
James Drunsfield	20.2L	1-5"			1	4					(b) 5	20	
Andrew Cuneo	20.5L	1-10"			46	80	21				(b)147	95	
Nick Genetti	21.4L	1-4"		9	11	11	8				(b) 39	18	
De Benedetti and Toscano	22.3L	1-7"			12	12					(b) 24	78	
Fred Podesta	22.9L	1-10"			100	200					(b,f)300	300	
--GAGING STATION (BELLOTA)--	24.15												
--STATE HIGHWAY 8 CROSSING--	24.25												
Albert A. Anderson	24.7L	1-12"			112	62	40				(b,g)214	115	
--GAGING STATION (BELLOTA-MORMON SLOUGH)--	(h)24.7L (0.2)												
J. G. Watkins	(h)24.7L (0.3R)	1-8"				8					(b) 8	12	
A. Solari	(h)24.7L (0.7L)	1-8"			70	60					(b,i)130	100	
Fred Casella	(h)24.7L (0.9L)	1-6"			50	50					(b,j)100	89	
Linden Orchard	(h)24.7L (1.15R)	1-12"			240	90					(b,k)330	319	
C. and F. Sanguinetti	(h)24.7L (1.5L)	1-8"		30	36	71					(b)137	80	
C. and F. Sanguinetti	(h)24.7L (1.8L)	1-6"		50	84	20					(b)154	84	
E. Maurigliano	(h)24.7L (1.8R)	1-10"			30	32	15				(b) 77	42	
V. Lagorio	(h)24.7L (3.5R)	1-10"				14	9				(b) 23	(l)	
V. Lagorio	(h)24.7L (3.7R)	1-6"				6	4				(b) 10	(m)41	
C. and F. Sanguinetti	(h)24.7L (6.3L)	1-6"				NO DIVERSION							
A. and R. Lagorio	(h)24.7L (7.3L)	1-8"			25	25	24				(b) 74	70	
Homer D. Riddle	(h)24.7L (13.1R)	1-6"					6	6			(b) 12	68	
--SOUTHERN PACIFIC RAILROAD CROSSING--	(h)24.7L (14.05)												
--STATE HIGHWAY 8 CROSSING	(h)24.7L (14.8)												
--S. T. AND E. RAILROAD CROSSING--	(h)24.7L (15.6)												
--STATE HIGHWAY 88 CROSSING	(h)24.7L (16.1)												
--CALIFORNIA CENTRAL TRACTION CO. RAILROAD CROSSING--	(h)24.7L (17.0)												
--U.S. HIGHWAY 50 AND 99 CROSSING	(h)24.7L (17.2)												

(a) Additional acre-feet diverted: January 50 and February 100.
(b) Additional water received from wells.
(c) Additional acre-feet diverted: January 45 and February 95.
(d) Additional acre-feet diverted: January 60 and February 80.
(e) Partially estimated.
(f) Additional acre-feet diverted: January 100 and February 200.
(g) Additional acre-feet diverted: January 110.
(h) Mileage listed is point of diversion from Calaveras River. Figure in () is miles along slough and canal as progresses back to Calaveras at point downstream.
(i) Additional acre-feet diverted: February 80.
(j) Additional acre-feet diverted: February 72.
(k) Additional acre-feet diverted: January 50 and February 100.
(l) See plant at Mile 24.7R (3.7R).
(m) Combined acreage this plant and one at Mile 24.7R (3.5R).

TABLE 156 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - CALAVERAS RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--GAGING STATION (STOCKTON DIVERTING CANAL)--	(a)24.7L (17.9)												
L. F. Grimsley	25.2L	1-14"			117	38	50				(b)205	203	
Vignolo and Pallauicino	25.5R	1-10"			43	100					(b)143	143	
McGurk Ranch	26.3R	1-8"			5	31	10				(b) 46	57	
Field Brothers	26.3L	1-6"		37	12	62	7				(b)118	115	
E. E. Cady	27.9L	1-6"		15	43	49					(b)107	87	
L. and A. V. Laggorio	28.2L	1-12"			1	34					(b) 35	50	
Garravanto and Maffeo	28.3L	1-6"			10	8	1				(b) 19	50	
O. R. Shelley	28.7L	1-8"				12	90				(b)102	90	
O. R. Shelley	28.7R	1-5"				16	2	1			(b) 19	65	
M. N. Yocum	28.8L	1-8"		15	42	35	12				(b)104	90	
A. G. Watkins	29.0R	1-10"			7	63	27				(b) 97	135	
L. and D. Hoag	29.7R	1-14"	9	1	9	69	45	63	35		(b)231	158	
Lynn Barnett	29.9R	1-7"			15	20					(b) 35	25	
Louise Hunt	30.0R	1-8"			60	42	70	34			(b)206	68	
S. M. Gregory	30.2R	1-10"			151	95	132	24			(b)402	130	
S. M. Gregory	30.3R	1-6"			5	13	7	10			35	59	
Eva Hunt	31.3R	1-6"			2	15	17	28	3		65	55	
--GAGING STATION JENNY LIND--	35.6												
Totals			9	107	1515	1761	617	166	38		4213	3571	
Average cubic feet per second			0	2	25	30	10	3	1		9		
Monthly use in per cent of seasonal			0.2	2.5	36.0	41.8	14.7	3.9	0.9				

(a) Mileage listed is point of diversion from Calaveras River. Figure in () is miles along slough and canal progresses back to Calaveras at point downstream.

(b) Additional water received from wells.

TABLE 157

DIVERSIONS AND ACREAGES - OLD SAN JOAQUIN RIVER - 1949

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Contra Costa Canal	30.5L	2-30" 2-42"	1598	1523	3189	4315	4823	3645	3554	3495	(a)26142	(b)3914	
Leo Fallman	36.4L	1-16"		36	73	147	131	116	137	85	(c)725	527	
East Contra Costa Irr. Dist.	36.5L	2-18" 2-24" 2-30"		2930	7610	6290	6530	4200	2310	660	(d)30530	16115	
Augustus Sarija (e)	36.5L	2-6"		21	18	28	27	15	7	11	127	84	
Byron-Bethany Irr. Dist.	40.9L	1-24" 1-30"		4227	5452	5054	5301	4803	3421	2582	(f)30840	10260	
M. R. Furtado	44.8L	1-14"		137	209	219	161	125	182	98	(g) 1131	365	
George Ray	45.3L	1-12"				PLANT REMOVED							
H. Lindeman and Son	47.2L	1-12"		170	156	180	188	214	180	172	1260	355	
G. Lindeman	47.2L	1-10"				NO DIVERSION							
West Side Irr. Dist.	47.65L	7-15"	319	6283	4951	4963	6278	4931	3081	1656	(h)32462	11049	
Vance Brown	48.7L	1-12"		55		24	32	44	9		164	60	
Naglee Burke Irr. Dist.	50.4L	1-16" 1-18"		1623	1088	1624	1388	1380	1071	722	(i) 8896	(j)2507	
Freemont Irr. Association	50.9L	1-16"	24	436	145	305	309	267	292	26	1804	(k) 662	
Joe M. Freitas	51.0L	1-8"		3	3	8	22	10			46	36	
Attilio Casserini	51.2L	1-8"				NO DIVERSION							
Excelsior Ranch #2	52.4L	1-10"		30	5	25	23	20	21	13	(l)137	112	
A. L. Galli	53.0L	1-8"		48	46	25	16	9	7	1	152	55	
--MOUTH OF TOM PAINE SLOUGH - MILE 54.3--													
Totals			1941	17522	22945	23207	25229	19779	14272	9521	134416	46101	
Average cubic feet per second			32	294	373	390	410	322	240	155	277		
Monthly use in per cent of seasonal			1.4	13.0	17.1	17.3	18.8	14.7	10.6	7.1			

* Distance from mouth of San Joaquin River 4⅛ miles below Antioch (mileage as established by War Department Survey of 1913-15).
(a) Additional acre-feet diverted: January 2374, February 2505, November 2386 and December 2280.
(b) In addition to this acreage also served Industrial and Municipality.
(c) Additional acre-feet diverted: November 1.
(d) Also received 3698 acre-feet water from wells.
(e) Formerly listed as Agustus Serge.
(f) Additional acre-feet diverted: February 53 and November 289.
(g) Additional acre-feet diverted: February 60 and November 13.
(h) Additional acre-feet diverted: January 48, February 46 and November 178. Also received water from wells.
(i) Additional acre-feet diverted: November 15.
(j) Includes 7 acres of Freemont Association lands.
(k) An additional 7 acres furnished water by plant at Mile 50.4L.
(l) Additional acre-feet diverted: November 26.

TABLE 158

DIVERSIONS AND ACREAGES IRRIGATED - TOM PAINE SLOUGH DELTA UPLANDS - 1949

Water User	Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Independent Mutual Water Corporation and Company	0.7S	2-18"	27	749	330	585	644	678	406	338	3757	(a)1310	
Independent Mutual Water Corporation and Company	1.5S	1-18"		52	72	102	86	78	55	23	(b)468	(c)	
George J. Lake	(d)2.1S	1-10"		122	36	59	86	83			386	170	
Holly Sugar Corporation	(e)2.1S	1-12" 1-14"	95	173	179	229	340	274	417	430	(f)2137	784	
Tracy Clover Irr. Dist.	2.1S	1-16"				PLANT	REMOVED						
Pescadero Reclamation Dist. #2058 #1	2.9S	1-12"		122	106	128	142	121	118	11	748	231	
Pescadero Reclamation Dist. #2058 #3	6.3S	1-12" 1-20" 1-24"		1914	2130	2130	2600	2440	1992	432	13638	2192	383
Pescadero Reclamation Dist. #2058 #5	8.3S	1-12"	33	177	169	181	250	209	123	114	1256	194	
Pescadero Reclamation Dist. #2058 #5a	9.0S	1-12"		225	92	156	176	134	115	14	(g)912	326	
Totals			155	3534	3114	3570	4324	4017	3226	1362	23302	5207	383
Average cubic feet per second			3	59	51	60	70	65	54	22	48		
Monthly use in per cent of seasonal			.7	15.2	13.4	15.3	18.6	17.2	13.8	5.8			

* Distance along Tom Paine Slough from its mouth which is at Mile 54.3 on Old San Joaquin River. (War Department Survey of 1913-15.)

(a) Combined acreage this plant and plant at Mile 1.5S.

(b) Additional acre-feet diverted: November 128.

(c) See plant at Mile 0.7S.

(d) Formerly listed as 1.8S.

(e) Formerly listed as two points of diversion at Miles 2.0S and 2.1S.

(f) Additional acre-feet diverted: February 7, November 416 and December 64.

(g) Additional acre-feet diverted: November 1.

TABLE 159

DIVERSIONS AND ACREAGES IRRIGATED - SAN JOAQUIN RIVER DELTA UPLANDS - 1949
(Stockton to Vernalis)

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--GARWOOD BRIDGE - MILE 45.3--													
Carolyn Weston	46.1R	(a)1-4"			1	1					2	(b)32	
Carolyn Weston (c)	46.2R	1-6"			1	1	23	8	15	1	49	(d)	
Carolyn Weston	46.3R	(e)1-12"			99	85	74	54	2	59	373	225	
Ivy Ranney	46.65R	1-8"			34						34	15	
Frank West	46.85R	1-10"		87	112	91	101	61	76	46	574	160	
F. Asano (f)	47.2R	1-6"	1	12	9	4	14	13	9	4	(g) 66	30	
Wolfinger Bros.	47.3R	1-10"		1		1	1	34	3		40	47	
C. C. Long (h)	47.55R	1-10"						212			212	110	
Waldo C. Haack (i)	48.0R	1-14"		87				286	11		384	365	
Lee Young	48.3R	1-4½"				20		6	2	2	30	18	
Lee Young	48.5R	1-3"				NO DIVERSION							
Joe Calcagno	48.5R	1-6"		1	43	56	42	28	38	1	209	68	
Dr. J. M. Carr	48.55R	1-6"		11	15	14	8	8	7	6	69	28	
G. B. Figari	48.6R	1-5"				PLANT REMOVED							
Calcagno Bros.	48.66R	1-8"			129	123	100	62	78		492	157	
M. O. Cooper Estate	49.0R	1-10"				PLANT REMOVED							
Herbert Spangenberg and S. B. Chapman	49.3R	1-14"		107	115	183	159	148	95	76	(j)883	(k)250	
Herbert Spangenberg and S. B. Chapman	49.5R	1-12"		13	18	20	25	15	10	5	(l)106	(m)	
A. A. Rodgers	50.1R	1-10"		12	23	35	24	33	13	14	(n)154	67	
--BRANDT BRIDGE - MILE 50.2--													
A. Hirata	50.4R	1-8"		27	23	29	36	53	38	19	225	90	
Watanabe, R. K. and F.	50.6R	1-6"	4	32	22	47	22	19	14	8	(o)168	49	
D. Toscano	50.8R	1-6"		15	7	23	18	11	9	3	86	30	
Pastorino Bros.	51.0R	1-6" 1-10"			15	1	1		1	80	98	142	
Phillip Esteban	51.2R	1-12"		23	30	40	43	29	17	6	188	98	
J. Burchel	52.1R	(p)1-10"		31	48	40	53	37	3		212	50	
G. Santini	52.4R	1-5"		8	6	4	7	5	11	1	42	17	
D. J. Macedo	52.65R	1-10"		57	42	40	60	39	22		260	96	
J. Widmer	53.2R	1-12"	27	39	134	122	288	88	189		(q)887	336	
William Nishimura	53.4R	1-8"		17	8	10	18	6	4	2	(r) 65	30	
I. N. Robinson, Jr. and John Domingo	53.7R	1-12"		166	96	238	406	151	50	27	1134	535	
R. E. Albertson	54.9R	1-10"		31	96	106	120	96	97	109	(s)655	157	
Oakwood Stock Farm	56.0R	1-10"				PLANT REMOVED							
--JUNCTION WITH MIDDLE RIVER - MILE 56.2--													
Oakwood Stock Farm	57.0R	1-14"		228	256	276	338	275	171	105	1649	282	
James Tobin	57.15R	1-7"		4	3	20	32	35	7		101	42	
Frank Dewar, et al (t)	57.38R	1-4"			8	22	4	12	1		47	17	
G. Gardella and Co.	57.5R	1-4"		4	7	2	3	3	1		(u) 20	19	
A. Queirolo	57.65R	(v)1-3"			6			1			7	5	
A. Queirolo	58.6R	1-3"			2	1				1	4	5	
R. Mauro	58.7R	1-4"					2	1			3	13	
--MOSSDALE BRIDGE - RECORDING GAGE - MILE 58.9--													

* Distance along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage as established by War Department Survey 1913-15).

(a) The 3" unit removed in 1949.
(b) Combined acreage this plant and plant at Mile 46.2R.
(c) New installation in 1949.
(d) See plant at Mile 46.1R.
(e) Replaces 6" and 10" formerly listed at this location.
(f) Formerly listed as Y. Takashiro.
(g) Additional acre-feet diverted: November 1 and December 1.
(h) Formerly listed as C. C. Young.
(i) Formerly listed as Alma A. Haack.
(j) Additional acre-feet diverted: February 4 and November 25.
(k) Combined acreage this plant and plant at Mile 49.5R.
(l) Additional acre-feet diverted: November 3.
(m) See plant at Mile 49.3R.
(n) Additional acre-feet diverted: November 4.
(o) Additional acre-feet diverted: November 10.
(p) Replaces 6" unit formerly listed at this location.
(q) Additional acre-feet diverted: February 6 and November 167.
(r) Additional acre-feet diverted: November 1.
(s) Additional acre-feet diverted: November 40.
(t) Formerly listed as DeWar.
(u) Additional acre-feet diverted: November 5.
(v) Formerly listed as a 2⅜" unit.

TABLE 159 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - SAN JOAQUIN RIVER DELTA UPLANDS - 1949
(Stockton to Vernalis)

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
C. C. Abersold	59.25R	1-6"	1	17	25	14	28	35	18	14	(a)152	50	
H. A. Neistrath	59.3R	1-15"		57	184	153	209	217	127	28	(b)975	239	
G. Giovacchini	59.5L	1-14"			204	165	56	102	143		670	135	
H. A. Neistrath	60.1R	1-6"		4	11	40	39	31	13	3	141	42	
A. F. Wendler (c)	60.5L	1-12"		34	61	83	15	25	23	31	272	(d)182	
A. F. Wendler (c)	61.5L	1-8"		12	2	13	42	33	11		113	63	
A. A. Jensen	62.0L	1-12"	2	122	25	65	39	90			(e)343	125	
--PARADISE DAM (HEAD OF PARADISE CUT) - MILE 62.2L (f)--													
Paradise Mutual Water Co.	62.2L	1-20"		541	366	507	407	369	393	18	2603	820	
Dethlefsen Bros.	62.75L	1-10"			11	19	12	6	10	9	67	12	
Dethlefsen Bros.	63.0L	2-20"	6	669	628	575	916	999	496	293	(g)4582	1585	
Manuel Brazil	66.7L	1-8"		76	64	128	46	85	33	31	463	130	
Banta-Carbona Irr. Dist.	67.5L	2-8" 2-20" 3-24" 1-33"	1130	10279	7756	8466	9810	7377	4638	2345	(h)51803	(i)17098	
Bradford S. Crittenden	70.0L	1-6"		49	91	95	92	87	25	45	484	115	
Richard Burnley (j)	70.5R	1-10"	NO DIVERSION										
Reclamation District #2075	71.0R	1-16"		384	666	816	679	726	531	162	(k)3964	(l)1554	
E. Filippini (m)	71.0R	1-4"		1	6	7	7	10	5	2	38	11	
H. J. Mortensen, Borges and (n) Barker	73.2R	(o)1-8" 1-12"		37	191	230	254	173	230	37	1152	500	
San Joaquin River Club	(p)74.7L	1-6"	56	121	86	68	85	26	78	139	(q)659	50	
E. A. Tassi (m)	75.6R	1-16"		18	104	42	175	162	89	36	(r)626	350	
Totals			1227	13434	11893	13141	14933	12382	7857	3768	78635	26946	
Average cubic feet per second			20	226	193	221	243	201	132	61	162		
Monthly use in per cent of seasonal			1.6	17.1	15.1	16.7	19.0	15.7	10.0	4.8			

* Distance along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage as established by War Department Survey 1913-15).

(a) Additional acre-feet diverted: February 3 and November 1.
(b) Additional acre-feet diverted: November 52.
(c) Formerly listed as Mrs. Wendler.
(d) Additional 130 acres of double crop
(e) Additional acre-feet diverted: February 7.
(f) Formerly listed as Mile 62.6L.
(g) Additional acre-feet diverted: January 773 and December 572.
(h) This figure includes following acre-feet furnished outside district; Banta Farms 2179, Kasson District 2010 and outside contracts 3300. Additional acre-feet diverted: November 412.
(i) This figure includes following acreages outside districts; Banta Farms 788, Kasson District 599 and outside contracts 1124. An additional 120 acres double cropped in Banta Farms.
(j) Formerly listed as J. Y. Matsumoto.
(k) Additional acre-feet diverted: January 23 and November 37.
(l) An additional 70 acres double cropped.
(m) New installation in 1949.
(n) Formerly listed as Mortensen, Borges and Whitman.
(o) New 8" unit installed in 1949.
(p) Formerly listed as Mile 75.1L.
(q) Additional acre-feet diverted: January 46, February 116, November 90 and December 111.
(r) Additional acre-feet diverted: November 1. Additional water received from controlled drainage.

TABLE 160

DIVERSIONS AND ACREAGES IRRIGATED - SAN JOAQUIN RIVER - 1949
(Vernalis to Fremont Ford Bridge)

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--DURHAM FERRY BRIDGE - MILE 76.7--													
--U.S.G.S. GAGING STATION - SAN JOAQUIN RIVER NEAR VERNALIS - MILE 76.7--													
A. J. Chisholm	78.9R	1-10"				13	8				21	40	
Cruze, Kirby, Genova	79.4R	1-20"		20	122	226	65	120	116		669	115	
--STANISLAUS RIVER - MILE 79.7R--													
--MAZE ROAD BRIDGE - MILE 81.85--													
W. C. Blewett Estate	81.95L	3-12"		768	554	732	773	721	594	231	4373	1104	
El Solyo Water Co. (a)	82.0L	(b)1-10" 3-18"		3244	2830	2465	3125	2710	1878	1088	(c)17340	3814	
--GAGING STATION - SAN JOAQUIN RIVER AT HETCH HETCHY WATER SUPPLY CROSSING - MILE 82.65--													
--TUOLUMNE RIVER - MILE 91.0R--													
West Stanislaus Irr. Dist.	91.8L	(d)1-12" 1-24" 6-26"	849	11349	11076	11809	15653	12823	7432	2254	(e)73245	(f)21825	
J. B. Erkenbrecher #1	91.8L	1-14"			60	146	120	14			340	100	
Mr. and Mrs. Frank Sarmento #2	91.8L	2-16"		612	509	762	691	536	499	21	3630	750	
J. B. Erkenbrecher #3	91.8L	1-16"	1	20	56	55	55	57	49	11	(g)304	75	
Mr. and Mrs. Frank Sarmento #4	91.8L	(h)2-16"		102	428	502	509	502	372		2415		225
Rancho dos Rios (#3 RB) (i)	94.7R	1-12"		135	343	278	292	248	117	84	1497	185	
Rancho dos Rios (#2 LB) (i)	95.2L	1-10"		193	85		97	206	26		607	80	
Rancho dos Rios (#2 RB) (i)	95.5R	1-10"		191		26	104	26	217	174	(j)738	380	
Rancho dos Rios (#1 RB) (i)	95.8R	1-10"		57	136	37	152	103	30		515	75	
Rancho dos Rios (#1 LB) (i)	95.9L	1-10"		94		238	98	126	118		674	120	
--LAIRD SLOUGH BRIDGE - GAGING STATION - SAN JOAQUIN RIVER NEAR GRAYSON - MILE 96.05--													
Rancho El Pescadero	98.9L	1-18"		412	89	400	574	249	37		(k)1761	910	
--PATTERSON BRIDGE - MILE 104.4--													
Patterson Water Company	104.4L	1-14" 1-18" 3-20" 1-36"		8119	7880	7983	9054	6524	5199	562	(l)45321	(m)13556	
Chase Brothers	104.5R	1-10"		164	219	83	228		191		885	150	
M. L. Simmons	104.52L	1-5"		2	3	3	3	2	1	2	16	11	
Harry Black (n)	104.7L	1-4"			2	2	2	1	1	2	10	3	
Chase Brothers (o)	106.5R	1-10"		1	73	182	155	93	216	129	(p)849	300	
Twin Oaks Irr. Dist.	109.8L	1-12" 3-16"		1631	1546	1401	1667	1421	795	334	(q)8795	1089	400
Roy Ustick	112.55R	1-16"		104	172	128	157	221	216	43	(r)1041	500	
--CROWS LANDING BRIDGE - MILE 113.4--													
Frank C. Mosier (s)	113.4R	1-10"			2	31	32	30	37	28	160	48	
--NEW CROWS LANDING BRIDGE - MILE 113.5--													
A. J. Silveria	113.85R	1-6"		10	12	17	9	5	5		58	12	
A. J. Silveria	114.35R	1-7"		11	8	18	15	11	6	7	76	24	
Frank C. Mosier	114.63R	1-8"	2	36	52	58	53	61	55	29	(t)346	65	
G. L. Dutcher	(u)114.9R	1-10"		48	28	41	33	39	36	14	249	35	
Glen H. Crow Estate	115.0L	1-10"		10	14	10	8	13	11	2	(v) 68	46	
L. B. Crow	116.05L	1-14"		78	103	111	113	120	113	39	677	200	
Howard Bell	116.95R	1-12"		37	44	30	44	16	9		(w)180	169	
--MERCED RIVER SLOUGH - MILE 122.2R--													
--U.S.G.S. GAGING STATION - SAN JOAQUIN RIVER NEAR NEWMAN - MILE 123.7--													
--MERCED RIVER - MILE 123.75R--													
--FREMONT FORD BRIDGE GAGING STATION - MILE 129.5--													
Totals			852	27448	26456	27787	33889	26998	18376	5054	166860	45781	625
Average cubic feet per second			14	461	430	467	551	439	309	82	343		
Monthly use in per cent of seasonal			0.5	16.4	15.9	16.7	20.3	16.2	11.0	3.0			

* Mileage along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage established by War Department Survey of 1913-15).
(a) Formerly listed as El Solyo Ranch Co.
(b) 10" unit replaces 12" unit formerly listed at this location.
(c) Additional acre-feet diverted: November 83.
(d) Formerly listed as 3-26" units in 1949.
(e) Additional acre-feet diverted: February 643, November 362 and December 266. Additional water received from wells.
(f) Of this figure 1655 acres was double cropped. Includes 1810 acres irrigated outside of district.
(g) Additional acre-feet diverted: November 23.
(h) One new 16" unit installed in 1949.
(i) Formerly listed as Rancho Dos Rios.
(j) Also receives water from Turlock Irrigation District. Additional acre-feet diverted: November 32.
(k) Additional acre-feet diverted: February 191. Additional water received from wells.
(l) Additional acre-feet diverted: November 11 and December 9.
(m) Of this figure 520 acres was double cropped.
(n) Not listed prior to 1949.
(o) Re-installation at old point of diversion.
(p) Additional acre-feet diverted: November 43.
(q) Additional acre-feet diverted: November 5.
(r) Also receives water from Turlock Irrigation District.
(s) New installation in 1949.
(t) Additional acre-feet diverted: January 7 and February 6.
(u) Formerly listed as 115.05R.
(v) Also receives water from San Joaquin Canal Co.
(w) Also receives water from controlled drainage.

TABLE 161

DIVERSIONS AND ACREAGE IRRIGATED - UPPER SAN JOAQUIN RIVER - 1949
FREMONT FORD TO GRAVELLY FORD

(This data furnished by U.S. Bureau of Reclamation)

Table Extended on Opposite Page

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
1	--FREMONT FORD BRIDGE - GAGING STATION--	129.5						1
2	Arch Stevinson	133.76R	(a)1-5"					2
3	--DELTA BRIDGE - GAGING STATION--	158.7						3
4	Erreca Farms	161.9R	(b)1-20"		NO DIVERSION			4
5	Erreca Farms	(c)163.6R (0.3)	Gravity		NO DIVERSION			5
6	D. L. McNamara	(c)163.6R (1.4)	1-16"			76		6
7	--GAGING STATION - NEAR EL NIDO--	168.0						7
8	--GAGING STATION - NEAR DOS PALOS--	186.0						8
9	San Luis Canal Co.**	(e)186.6L	Gravity	323	3794	11863	17220	9
10	--FIREBAUGH BRIDGE--	198.4						10
11	Ivan N. Zaninovich** (f)	205.11L	(g)1-7"					11
12	Ivan N. Zaninovich** (f)	205.59L	(i)1-6"				4	12
13	Antone Zaninovich	206.02R	(k)1-3"					13
14	--GAGING STATION - NEAR MENDOTA--	206.2						14
15	--MENDOTA DAM--	208.63						15
16	San Joaquin Canal Co.** (l)	(m)208.63	Gravity	5512	17486	23616	73263	16
17	Firebaugh Canal Co.**	(m)208.63	2-24" 2-36" 1-42"	1900	3408	2067	12791	17
18	Grass Lands Water Association**	(m)208.63	Gravity				644	18
19	Dr. E. L. Mott** (f)	(m) (s)208.63	Gravity		82	279	570	19
20	Panoche Water Distribution Association** (f)	(m) (u)208.63	Gravity		5513	7513	4682	20
21	Sam Hamburg** (f)	(m) (x)208.63	Gravity					21
22	--FRESNO SLOUGH--	208.9L						22
23	Eugene Ham** (f) (z)	(aa)214.63L	1-6"				59	23
24	Eugene Ham** (f) (z)	214.83L	1-4"					24
25	Eugene Ham** (f) (z)	215.25L	1-8"					25
26	Webster Bros.** (f)	(dd) (ee)217.03L	Gravity					26
27	F. A. Yearout** (f)	(dd)217.03L						27
28	F. A. Yearout** (f) (z)	218.40L	1-12"				95	28
29	F. A. Yearout** (f) (z)	218.73L	1-12"					29
30	Z. R. Fultz** (f)	218.91L	Gravity				69	30
31	--LONE WILLOW SLOUGH--	219.8R						31
32	Columbia Canal Co.**	219.8R	Gravity	597	923	3927	5904	32
33	Breakwater Duck Club** (f)	(jj)218.8R	Gravity					33
34	Ray Flanagan** (f)	(ll)218.8R	Gravity				3719	34
35	--GAGING STATION - AT WHITEHOUSE--	219.83						35

* Distance along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage as established by War Department Survey 1913-15.).
** Pertinent data furnished by U.S.B.R.
(a) Size of unit not formerly listed.
(b) Formerly listed as an 18" unit.
(c) Plant diverts San Joaquin water at this mile. Figure in () indicates distance along East Side Canal from San Joaquin River.
(d) Also received water from Sand Slough located at Mile 1.0 from head of East Side Canal. Receives some water from wells.
(e) Point of diversion is at head of Temple Slough.
(f) Diversion contracts with U.S.B.R. are limited to one year periods.
(g) Formerly listed at Mile 205.33L. Unit formerly listed at this location removed.
(h) Combined acreage this plant and one at Mile 205.59L.
(i) Replaces 5" unit formerly listed at this location.
(j) See plant at Mile 205.11L.
(k) Formerly listed as 4" unit.
(l) Includes Main Canal, Helm Canal, Outside Canal and Helm Ditch. Excludes diversions through Outside Canal to Dr. E. L. Mott and Panoche Water Distribution Association and also Sam Hamburg's diversions from June 15 through September 15. Also excludes diversions through the various canals of the San Joaquin Canal Company to the Grass Lands Water Association.
(m) Point of delivery is considered to be Mendota Pool.
(n) Includes some double cropping and interplanting.
(o) Additional water received from wells.
(p) An additional 3478 acres double cropped.
(q) Conveyance losses between Mendota Pool and points of diversion amounted to approximately 8,014 acre-feet of this figure. Net of 48,483 diverted to land.
(r) Estimated irrigated portion of a total of 70,000 acres.
(s) Re-diverted from Outside Canal by means of 2-12" pumps on intake channel at Mile 18.24L below head and 2-12" pumps at Mile 19.24L below head.
(t) Conveyance losses between head of Outside Canal and lift pumps amounted to approximately 210 acre-feet of this figure. Net of 5,049 diverted through lift pumps.
(u) Re-diverted from Outside Canal by menas of 3-50" and 2-24" pumps on intake channel at Mile 235.8L below head.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
1											
2				4	7	7	10	7	35	20	
3											
4											
5											
6	65	118	134	151					(d)544	150	
7											
8											
9	15961	19192	20509	17470	13492	6623	2985	6885	136317	41496	
10											
11		4	8	6	3				21	(h)112	
12	4	20	14	12	5				59	(j)	
13		4	7	6					17	10	
14											
15											
16	67962	74998	75858	50830	28855	17900	9879	6839	452998	(n)133422	7218
17	8277	10526	8999	8410	4729	3784	1952	918	(o)67791	(p)18714	3926
18	3987	8091	5189	560	12075	21953		3998	(q)56497	(r)28000	
19	905	843	960	988	254	124	122	132	(t) 5259	854	840
20	2911	8384	9025	7599	6432	6057	3830	3628	(v)65574	(w)29034	320
21		1056	2704	2031	790				(y) 6581	6427	
22											
23	30		112	123					(bb) 324	(bb) 237	
24									(cc)	(cc)	
25									(cc)	(cc)	
26		21	160	142					323	205	
27						82			82	(ff) 80	
28	210		272	402					(gg) 979	(gg)488	
29										(hh)	
30	149		168	163					549	160	
31											
32	5442	5866	6230	6371	4705	2954	2245	2547	(ii)47711	15153	460
33						200	24	218	442	(kk)100	
34	4334	4028	4149	3897					(mm)20127	(nn)6039	1478
35											

(v) Conveyance and other losses amounted to approximately 3629 acre-feet of this figure. Net of 61945 diverted through lift pumps. Additional water received from wells.
(w) An additional 273 acres double cropped.
(x) Re-diverted from Outside Canal by means of 2-16" and 1-24" pumps on intake channel located at Mile 25.75L below head. Replaced two of the three 24" pumps formerly at same location with 2-16" pumps in July 1949. Except for the June 15 - September 15 period, water was received from San Joaquin Canal Company.
(y) Conveyance and other losses amounted to approximately 634 acre-feet of this figure. Net of 5947 diverted through lift pumps. Additional water received from well pumps.
(z) New installation in 1949.
(aa) Portable unit used in various locations between Mile 214.63L and 215.63L.
(bb) Combined acreage and diversion of this plant and plants at Miles 214.83L and 215.25L.
(cc) See plant at Mile 214.63L.
(dd) Point of diversion is at head of Mowry Canal.
(ee) Re-diverted from Mowry Canal by means of 1-4", 1-6" and 1-14" pumps approximately one-half mile below head. Pumps were installed in June and July 1949.
(ff) Acreage estimated. All gun club lands.
(gg) Combined acreage and diversions of this plant and plant at Mile 218.73L.
(hh) See plant at Mile 218.40L.
(ii) Additional water received by wells.
(jj) Point of re-diversion is on Lone Willow Slough at Mile 2.2R below head.
(kk) Acreage estimated. All gun club lands.
(ll) Delivery is through Chowchilla Canal re-diverting from Lone Willow Slough 2.3 miles below head.
(mm) Conveyance losses amounted to approximately 804 acre-feet of this figure. Additional water received from wells.
(nn) An additional 2068 acres double cropped.

TABLE 161 (CONT'D)

DIVERSIONS AND ACREAGE IRRIGATED - UPPER SAN JOAQUIN RIVER - 1949
FREMONT FORD TO GRAVELLY FORD

(This data furnished by U.S. Bureau of Reclamation)

Table Extended on Opposite Page

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
36	George Frusetta** (a)	220.27L	Gravity				33	36
37	Alfred R. Brown** (a) (c)	(d)221.63L	1-5"	27				37
38	Alfred R. Brown** (a) (c)	222.36L	1-12"					38
39	Alfred R. Brown** (a)	227.86L	Gravity				240	39
40	Rose Campbell (g)	232.55L	1-6"				3	40
41	R. E. Jones	232.65L	1-5"			3	7	41
42	Gravelly Ford Water Association** (a)	232.8R	Gravity				722	42
43	--HEAD OF GRAVELLY FORD CANAL -	232.8R						43
44	Totals			8359	31206	49344	120025	44
45	Average cubic feet per second			136	562	802	2017	45
46	Monthly use in per cent of seasonal			1.0	3.6	5.6	13.7	46

* Distance along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage as established by War Department Survey 1913-15).
** Pertinent data furnished by U.S.B.R.

(a) Diversion contracts with U.S.B.R. are limited to one year periods.
(b) Estimated irrigated portion of a total of 70,000 acres.
(c) New installation in 1949.
(d) Portable unit used in various locations between Mile 221.63L and Mile 225.63L.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
36	139		184						356	(b)200	
37								9	36	(e)1000	
38		4	9	21	19	98	20	15	186	(f)	
39		24	217		435				916	(f)	
40	2	6	6	6	3				26	15	
41	7	11	11	11	4				54	13	
42	1845	2787	2668	2471	2160	722	16		13391	3802	396
43											
44	112230	135983	137593	101704	73968	60504	21083	25196	877195	285731	14638
45	1825	2285	2238	1654	1243	984	354	410	1212		
46	12.7	15.5	15.7	11.6	8.4	6.9	2.4	2.9			

(e) Acreage combined under pumping plants at Mile 221.63L and Mile 222.3L and gravity diversion at Mile 227.86L. Includes partial irrigation of 289 acres of sudan grass as well as scattered flooding of grazing lands.
(f) See plant at Mile 221.63L.
(g) Installed prior to 1949, not formerly listed.

TABLE 162

DIVERSIONS AND ACREAGE IRRIGATED - UPPER SAN JOAQUIN RIVER - 1949
GRAVELLY FORD TO FRIANT DAM

Table Extended on Opposite Page

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
1	Roland Betzer	233.66R	1-6"			7	29	1
2	W. A. Kochergen	234.00R	1-6"		NO DIVERSION			2
3	M. Nazaroff	234.62L	1-5"				3	3
4	E. Arata	234.68L	1-4"		2			4
5	Wheeler Ranch	(b)235.02S	(c)		PLANT REMOVED			5
6	J. A. Kochergen	235.03R	1-3"		PLANT REMOVED			6
7	G. V. Hart	235.03L	1-3"				1	7
8	E. F. Carlson	235.33R	1-5"		3	9	29	8
9	William Tolmosoff	236.25R	1-6"					9
10	Morello Winery	237.33L	1-8"				149	10
11	Lorraine Beatty (d)	237.43L	1-6"					11
12	J. Peterson	237.98R	1-6"			1		12
13	--SKAGGS BRIDGE--	238.18						13
14	D. Verduzco	239.45R	1-6"		PLANT REMOVED			14
15	--BOWSER RECORDER STATION--	242.41						15
16	P. J. Vincent	243.84R	2-6"					16
17	C. B. Hines	244.03L	(c)		NO DIVERSION			17
18	Lionel Steinberg	244.86L	1-7"					18
19	C. L. Hammar	245.36R	1-6"				46	19
20	Lionel Steinberg	245.81L	1-6"			3	2	20
21	Jasper Ranch (e)	246.15L	1-5"				7	21
22	Jasper Ranch (e)	245.34L	1-8"					22
23	H. W. Valentine	246.73L	1-5"				19	23
24	Vincent Jura	246.98L	1-4"		NO DIVERSION			24
25	--HERNDON BRIDGE--	247.38						25
26	Sam Deanda	247.50R	1-5"		NO DIVERSION			26
27	Frank, James and Adolph Oberti	247.64R	1-5"				35	27
28	Frank, James and Adolph Oberti	247.65R	1-4"				4	28
29	San Joaquin Light & Power Company	247.82R	1-3"				20	29
30	--HERNDON RECORDER STATION--	248.31L						30
31	Bud Bradburn	248.51L	1-3"				9	31
32	John Danisi	248.72L	1-5"			1	26	32
33	--SANTA FE RAILROAD CROSSING--	249.23						33
34	Moosios, Moosios and Vlahos	249.51R	1-4"		NO DIVERSION			34
35	Moosios, Moosios and Vlahos	250.56R	1-6"				13	35
36	Moosios, Moosios and Vlahos	250.76R	1-7"				10	36
37	D. M. Folsom	251.19L	1-4"		PLANT REMOVED			37
38	Sandstone Land & Cattle Company	251.46L	1-5"				12	38
39	W. A. McGillivary	(i)251.83L	(c)		PLANT REMOVED			39
40	W. A. McGillivary	(i)251.93L	(c)		PLANT REMOVED			40
41	West Coast Life Insurance Company	(i)252.03L	(c)		PLANT REMOVED			41
42	D. M. Folsom	253.10L	1-4"				3	42
43	D. M. Folsom	253.38L	1-5"		NO DIVERSION			43
44	Fred Russell	253.79R	1-6"		1	1	5	44
45	Howard and Epperson	254.57R	(c)					45

* Distance along San Joaquin River from its mouth 4⅛ miles below Antioch. (Mileage as established by War Department Survey 1913-15).

(a) Additional water received from Fresno Irrigation District.
(b) Point of diversion on Island at this mile.
(c) Size of unit not listed.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
1		24	32	25	6				123	65	
2											
3		7	11			9			(a) 30	30	
4		4	4			5			(a) 15	20	
5											
6											
7	1	1	1	1	1				6	2	
8	14	43	59	52	28	20	7	1	265	69	
9		12	32	7					51	40	
10	88	91	164	147			159	55	(a)853	280	
11		2	5	3	2				12	3	
12	14	48	69	46	4	15			197	74	
13											
14											
15											
16										157	
17											
18										40	
19	62	91	112	54	58	5			428	68	
20		23	15	4					47	30	
21				1					8	20	
22			46						(f) 46	137	
23	2	18	66	72	47	3			227	100	
24											
25											
26											
27	30	52	46	69	48	21	16		317	(g)130	
28	8	14	22	28	17	5	3		101	(h)	
29	8	25	32	21	13	13			132	25	
30											
31	2	11	21	5	3	2	1	1	55	15	
32	18	19	25	19	6		2		116	50	
33											
34											
35	5	77	50	15	25	11	15	5	216	53	
36	4				9		58		81	28	
37											
38	10	21	23	16	8				90	60	
39											
40											
41											
42	6	6	7	6	4	2			34	9	
43											
44	12	14	16	15	10	2	1		77	37	
45											

(d) Formerly listed as Anna E. Beatty.
(e) Formerly listed as Josephine Jasper.
(f) Additional water received from wells. Also can be served by Fresno Irrigation District.
(g) Combined acreage this plant and one at Mile 247.65R.
(h) See plant at Mile 247.64R.
(i) Point of diversion is on river slough.

TABLE 162 (CONT'D)

DIVERSIONS AND ACREAGE IRRIGATED - UPPER SAN JOAQUIN RIVER - 1949
GRAVELLY FORD TO FRIANT DAM

Table Extended on Opposite Page

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
46	Howard and Epperson	254.82R	1-5" 1-6"		NO DIVERSION			46
47	Howard and Epperson	254.93R	1-6"		NO DIVERSION			47
48	Bullard Ranch	254.98L	1-7"		NO DIVERSION			48
49	War Dads Memorial	255.05L	1-4"					49
50	McEacherm and Larson	(a)254.98S	1-5"		PLANT REMOVED			50
51	McEacherm and Larson	(a)255.28S	1-5"		PLANT REMOVED			51
52	McEacherm and Larson	255.34R	1-7"				18	52
53	McEacherm and Larson	(a)255.84S	1-6"				27	53
54	McEacherm and Larson	256.40R	1-5"					54
55	McEacherm and Larson	256.52R	1-6"					55
56	W. W. Pitman	256.60R	1-5"		PLANT REMOVED			56
57	Richard Holland	257.09L	1-7"		NO DIVERSION			57
58	Richard Holland	257.70L	1-7"				18	58
59	L. D. Cobb	258.08R	(b)1-5" 1-7"					59
60	--NEW LANES BRIDGE--	258.33						60
61	R. J. Curtis	258.39L	1-7"					61
62	W. E. Roberts	258.50L	1-4"			1	47	62
63	W. E. Roberts	258.66L	1-24"		PLANT REMOVED			63
64	W. E. Roberts	258.80L	1-6"			5	97	64
65	W. E. Roberts (e)	258.90L	1-6"					65
66	W. E. Roberts	259.07L	1-8"		PLANT REMOVED			66
67	J. E. Cobb	259.30R	(f)		NO DIVERSION			67
68	J. E. Cobb	259.39R	1-7"				13	68
69	--SITE OF OLD LANES BRIDGE--	259.78						69
70	Marjorie E. Sims	259.80L	1-6"				13	70
71	R. C. Arnold	261.53R	1-6"					71
72	E. G. Rank	(a)262.07S	1-6"					72
73	Isabel Burnham	262.13R	1-6"		PLANT REMOVED			73
74	D. M. Folsom	262.27L	1-7"				20	74
75	A. Brown (g)	262.43L	1-5"					75
76	E. G. Hank	262.48L	1-5"					76
77	Richard Holland	(j)263.66L	1-7"				40	77
78	Isabel Burnham	263.40R	1-7"				16	78
79	S. W. Ball	263.63L	(f)		INDUSTRIAL USE ONLY			79
80	Andrew Jensen	263.76R	1-5"				17	80
81	H. W. Ball	264.08L	1-10"		NO DIVERSION			81
82	W. F. Ball	264.83L	1-4"				4	82
83	V. D. Roullard	265.40L	(k)1-5"				2	83
84	B. B. Durando	267.56L	1-6"			20	23	84
85	--BELOW FRIANT GAGING STATION--	268.13L						85
86	--FRIANT BRIDGE--	268.8S						86
87	Wishon-Watson Company	269.18R	1-5"				3	87

* Distance along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage as established by War Department Survey 1913-15).

(a) Point of diversion on Island at this mile.
(b) New 5" unit added in 1949.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
46											
47											
48											
49		1	1						2	1	
50											
51											
52	23	28	27	28	15				139	30	
53	45	68	45	28	37	37		5	292	40	
54	19	43	34		1		57	32	186	48	
55	21	44		26					91	12	
56											
57											
58			6	77	34	17			152	30	
59	35	148	163	97	71	27			541	113	
60											
61	34	21	19	20	19				113	55	
62	34	60	28	3					173	(c)140	
63											
64	86	182	116	37	57	36	15		631	(d)	
65			88	109	123	79	72		471	(d)	
66											
67											
68	82	83	106	76	30	70			460	54	
69											
70	10	49	44	32	36	9			193	40	
71		17	25	20					62	40	
72		26	68	66	24				184	30	
73											
74	10	154	151	166	36				537	210	
75		8	48	58	6	8	6		134	(h) 99	
76		19	42	13					74	(i)	
77	48	95	45	59	63	51	37	14	452	109	
78	20	108	58	35	30	30	2		299	36	
79											
80	11	30	22	29	27	22	4		162	40	
81											
82	9	33	25	5	4				80	36	
83	8	11	91	64	15	2	1		194	37	
84	7	97	150	115	37	8	1	23	481	236	
85											
86											
87	47	30	75	12				11	178	42	

(c) Combined acreage this plant and plants at Miles 258.8L and 258.9L.
(d) See plant at Mile 258.50L.
(e) New installation in 1949.
(f) Size of unit not listed.
(g) Formerly listed as R. W. Fewel.
(h) Combined acreage this plant and plant at Mile 262.48L.
(i) See plant at Mile 262.43L.
(j) Formerly listed as Mile 262.66R.
(k) Replaces 4" unit formerly listed at this location.

TABLE 162 (CONT'D)

DIVERSIONS AND ACREAGE IRRIGATED - UPPER SAN JOAQUIN RIVER - 1949
GRAVELLY FORD TO FRIANT DAM

Table Extended on Opposite Page

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
88	--COTTONWOOD CREEK--	269.53R						88
89	--FRIANT DAM--	269.63						89
90	GRAVELLY FORD TO FRIANT DAM							90
91	Totals			0	6	48	780	91
92	Average Cubic Feet Per Second			0	0	1	13	92
93	Monthly Use in Per Cent of Seasonal			0.1	0.5	7.9	8.5	93
94	Friant Kern Canal**	269.63				1260	1281	94
95	Madera Irrigation District (b)	(b) (c)269.63R	Gravity				3031	95
96	Chowchilla Water Storage Assn. (b)	(f)269.63R	Gravity			623	5470	96
97	D. W. Moody** (b)	(i)269.63R	1-4"					97
98	Max B. Arnold** (b)	(j)269.63R	(k)					98

* Distance along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage as established by War Department Survey 1913-15).

** Pertinent data furnished by U.S.B.R.

(a) This is supplemental water for service for acreages as follows: Tulare Lake Irrigation District 15100, Lindsay Strathmore Irrigation District 2500, Orange Cove Irrigation District 1600 and Ivanhoe Irrigation District 2500. These acreages have been approximated.

(b) Diversion contracts with U.S.B.R. are limited to one year periods.

(c) Point of delivery is considered to be at "Canal Side." Points of diversion are at Hildreth Creek Turnout Mile 13.1L Fresno River Wasteway Mile 18.8L, Dry Creek Mile 24.2L, Berenda Creek Mile 30.4L and Madera Canal at Mile 35.6. All mileages listed above are below head of Madera Canal.

(d) Of this amount, 27510 acre-feet were used for surface irrigation of crops by the District and 18838 acre-feet were used by the Chowchilla Water Storage Association but charged to Madera Irrigation District. The remaining 30292 acre-feet served to replenish the ground-water supply. Additional water received from wells.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
88											
89											
90											
91	833	1958	2335	1781	954	509	457	147	9808	3020	
92	13	33	38	29	16	8	8	2	13		
93	19.9	23.8	18.2	9.7	5.2	4.7	1.5				
94		454	16397	22691	3035				(a)45118		
95	5601	13729	25392	22303	6584				(d)76640	(e)40000	
96	6623	10992	15309	17702	15496				(g)72215	(h)45316	
97	1	2	3	2	2				10	3	
98				10	22				32	(l)142	

(e) Estimated irrigated portion of a total of 81505 acres. Of the 40000 acres there was approximately 1500 acres double cropped.
(f) Point of delivery is Madera Canal at Mile 35.6 from head of canal.
(g) Additional supply of 18838 acre-feet received from Madera Irrigation District. Additional water received from wells.
(h) Of this figure 2235 acres was double cropped.
(i) Diverts from Dry Creek approximately 500 feet below Madera Canal. Point of diversion for Dry Creek is Mile 24.2L below head of Madera Canal.
(j) Diverted from Madera Canal between Mile 30.4 and 31.83 below head.
(k) Size of unit not listed.
(l) This land received one irrigation only.

TABLE 163

DIVERSIONS AND ACREAGE IRRIGATED - FRESNO SLOUGH AND FRESNO SLOUGH BY-PASS* - 1949

(The following table arranged from data furnished by U.S. Bureau of Reclamation.)

Table extended on Opposite Page

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
1	E. P. Jennings (a) (b)	2.85L	1-14"				120	1
2	E. P. Jennings (a)	2.9L	1-12"					2
3	S. L. Heisinger and P. R. Engleman (a) (b)	6.4R	1-24"					3
4	Charles Sachs (a) (f)	7.1L	1-24"				529	4
5	Charles Sachs (a)	8.2L	1-30" 1-36"					5
6	Traction Ranch (i)	9.6R	1-20"				733	6
7	Traction Ranch (i)	11.4R	1-12"					7
8	--FRESNO SLOUGH BY-PASS - MILE 11.8R--							8
9	Traction Ranch (i)	(l)11.8R (0.75)	(m)1-20"					9
10	James Irrigation District (i) "P" Booster	(l)11.8R (4.4)	1-14" (o)1-16"			41	2270	10
11	Kerman Cattle Co. (a)	(l)11.8R (4.5)	1-12"				17	11
12	James Irrigation District (i) "N" Booster	13.25R	1-14" 1-20" 1-24"					12
13	J. W. Wilson	13.5L	1-12"			92	28	13
14	Tranquillity Irrigation District (i) Lift #1	14.1L	2-24"			145	6393	14
15	Tranquillity Irrigation District (i) Lift #2	15.9L	(t)2-24" 2-30"					15
16	Totals			0	0	278	10130	16
17	Average Cubic Feet per Second			0	0	5	170	17
18	Monthly Use in Per Cent of Seasonal			0	0	0.4	15.2	18

* The water in Fresno Slough and Fresno Slough By-Pass is mainly derived from the San Joaquin River by the Mendota Pool backwater created by Mendota Dam, and is occasionally augmented by Kings River via Fresno Slough By-Pass.

** Mileages listed are miles above the mouth of Fresno Slough. Mouth of Fresno Slough is at Mile 208.93 above mouth of San Joaquin River.

(a) Diversion contracts with U.S.B.R. are limited to one year periods.

(b) New installation in 1949

(c) Combined acreage and diversion this plant and one at Mile 2.9L.

(d) See plant at Mile 2.85L.

(e) Acreage estimated all gun club lands, flooded once.

(f) Temporary installation in 1949.

(g) Combined acreage and diversion for this plant and plant at Mile 8.2L.

(h) See plant at Mile 7.1L.

(i) These diverters received supplemental water by temporary annual contracts with U.S.B.R.

(j) Combined acreage and diversion this plant and plant at Mile 11.8R (0.75).

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
1	125	386	108	76	38				(c)853	(c)625	(c)470
2									(d)	(d)	(d)
3						42	80		122	(e)100	
4	413	555	539	777	3282				(g)6095	(g)4865	(g)370
5										(h)	(h)
6	1393	1381	1739	1031	339	68			(j)6724	(j)1076	(j)887
7				35					35	(k) 80	
8											
9									(n)	(n)	(n)
10	533	2462	3266	2790	973	370	341	45	(p)13091	(p)5232	(p)229
11	144	212	344	331	303	155			1506	(q)3500	
12									(r)	(r)	(r)
13		65	163	150	75	25			598	208	
14	5488	7070	8463	7461	2109	587			(s)37716	(s)6985	(s)2125
15									(u)	(u)	(u)
16	8096	12131	14622	12651	7119	1247	421	45	66740	22671	4081
17	132	204	238	206	120	20	7	1	92		
18	12.1	18.2	21.9	18.9	10.7	1.9	0.6	0.1			

(k) Flooding only for use of proposed game refuge.
(l) Plant diverts Fresno Slough water at this mile. Figure in () indicates distance along Fresno By-Pass from Fresno Slough.
(m) Replaces unit formerly listed at this location.
(n) See plant at Mile 9.6R.
(o) New 16" unit installed in 1949.
(p) Combined acreage and diversion of this plant and plant at Mile 13.25R.
(q) Scattered flooding of grazing land and gun club.
(r) See plant at Mile 11.8R.
(s) Combined acreage and diversion of this plant and plant at Mile 15.9L. Additional water obtained from wells through Beta Main Canal from Kings River. Kings River water received from May 18 through June 7, 1949.
(t) New 24" unit installed in 1949.
(u) See plant at Mile 14.1L.

TABLE 164

DIVERSIONS AND ACREAGES IRRIGATED - MERCED RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--HILLS FERRY BRIDGE - MILE 1.1--													
Stevinson Water District #1	1.8R	1-16"		71						49	(a) 120	160	
Stevinson Water District #2	3.8R	1-20"		287	363	368	492	411	318	182	(b)2421	600	
Milton Gordon	(c) 4.3L	1-10"		15	33	46	50	40	45	10	(d) 239	95	
--GAGING STATION - MERCED RIVER NEAR STEVINSON - MILE 4.6--													
Salvador De Angelis	4.8L	1-12"	4	11	5	14	25	10	6	9	84	33	
Maria De Angelis	5.8L	1-12"		23	51	54	41	31	45	1	246	93	
Lydell Peck	6.1L	1-15"				NO DIVERSION							
Stevinson Water District	7.7L	1-20"		487	259	614	576	11	89	105	(e)2181	1150	
Manuel Clemintino (f)	8.5L	1-12"		79	38	26	2	42	20		207	95	
Manuel Clemintino	(g) 8.9L	1-12"		20	11	23	13	9	15		91	85	
Samuel B. McCullagh	9.4L	1-12"		90	114	141	133	131	86	58	753	229	
J. R. Jacinto (h)	9.6L	1-12"		79	58	104	104	71	52	53	(i) 521	113	
R. W. Adams and Mrs. J. B. Silva	10.35L	1-8" 1-10"		205	76	277	299	226	202	143	(j)1428	404	
R. E. Prusso	10.8R	1-6"			19	13	11	20	16	2	81	30	
Manuel Freitas	(k)10.9L	1-12"				NO DIVERSION							
R. E. Prusso and John Vierra	(l)10.9L	1-5" 1-12"	8	118	47	162	127	100	54		616	219	
Tony Vierra	11.6L	1-8"		150	97	151	122	66	100	31	717	202	
J. Regello	11.6L	1-12"		56	31	82	50	76	41	13	349	133	
--MILLIKEN BRIDGE - MILE 11.65--													
M. Turner (m)	11.7R	(n)1-14"			17	20	9				(o) 46	25	
E. and J. Gallo Winery Ranch	12.35L	1-10"		8	36	36	68				(p) 148	100	
Soren Husman	(q)12.4L	1-6"		17	19	63	34	39	11	1	184	26	
M. Turner (m)	12.8R	(n)1-4"									(r)	35	
E. and J. Gallo Winery Ranch	12.85L	1-10"		68	138	238	239	143			(s) 826	160	
M. Turner (m)	13.4R	(n)1-4"									(r)	15	
Leonard Sward (m)	14.3R	(t)2-6"						2	10		(u) 12	68	
J. M. Souza (v)	14.5L	1-10"	1	31	29	67	46	35	45		254	81	
Leonard Sward (m)	14.8R	(t)2-6"									(w)	15	
Conie Koehn (m)	14.8L	1-5"		1	7		4				12	8	
Leonard Sward (m)	15.4R	(t)2-6"									(w)	18	
E. and J. Gallo Winery Ranch	16.5L	1-10"		45	102	212	227	84	3		(x) 673	150	
C. J. Carpenter	17.05L	1-7"		3	3	10	17	7	6	3	49	30	
Ervey V. Schmidt	17.7L	1-5"			7	7	12	13	7		46	14	
J. H. Thomas	17.85L	1-6"		10	11	20	17	7	6	8	(y) 79	26	
John Francis (m)	18.1R	1-5" 1-6"		11	31	47	46	26	19		(z) 180	22	
C. P. Hockett	18.5L	1-4"		5	2	4	4	4	5	4	(aa) 28	20	
John Francis (m)	18.6R	1-5" 1-6"									(bb)	39	
S. P. Magsalay	19.8L	1-6"		12	7	10	9	3	3	2	(cc) 46	19	
Frank P. Dutra	19.8L	1-6"			30	16	17	10	13	6	92	25	
John Francis (m)	20.3R	1-5" 1-6"									(bb)	18	
Rudolph Reininghaus (dd)	20.4L	1-6"		9	15	26	54	16	7	8	(ee) 135	102	

(a) Additional acre-feet diverted: February 1 and November 42.
(b) Additional acre-feet diverted: November 29.
(c) Formerly listed as Mile 4.0L.
(d) Additional acre-feet diverted: November 7 and December 3.
(e) Additional water received from Stevinson Water District Canal.
(f) Formerly listed as James F. Corado.
(g) Formerly listed as Mile 8.85L.
(h) Formerly listed as Joe R. Jacinto.
(i) Additional acre-feet diverted: November 2.
(j) Additional acre-feet diverted: November 4 and December 6.
(k) Formerly listed as Mile 10.8L.
(l) Formerly listed as Mile 10.85L.
(m) Not listed prior to 1949.
(n) Portable unit diverting water at plants at Miles 11.7R, 12.8R and 13.4R.
(o) Combined diversion this plant and plants at Miles 12.8R and 13.4R.
(p) Additional acre-feet diverted: November 19.
(q) Formerly listed as Mile 12.36L.
(r) See plant at Mile 11.7R.
(s) Additional acre-feet diverted: January 76, November 112 and December 250.
(t) Portable units diverting water at plants at Miles 14.3R, 14.8R and 15.4R.
(u) Combined diversion of this plant and plants at 14.8R and 15.4R.
(v) New installation in 1949.
(w) See plant at Mile 14.3R.
(x) Additional acre-feet diverted: November 169.
(y) Additional acre-feet diverted: November 2.
(z) Combined diversion of plants at Miles 18.1R, 18.6R and 20.3R.
(aa) Additional acre-feet diverted: November.
(bb) See plant at Mile 18.1R.
(cc) Additional acre-feet diverted: February 2 and November 3.
(dd) Formerly listed as John Reininghaus.
(ee) Additional water received from wells.

TABLE 164 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - MERCED RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
G. L. Carlson	20.6R	1-6"			7	20	17	14	13	6	77	31	
G. L. Carlson	20.65R	1-4"				NO DIVERSION							
--HIGHWAY 99 BRIDGE - MILE 21.04--													
--SOUTHERN PACIFIC RAILROAD (MAIN LINE) - MILE 21.05--													
A. C. Jorgensen #1	21.05R	1-6"		5	10	9	13	9	2	2	50	27	
A. C. Jorgensen #2	22.2R	1-16"	15	215	205	341	295	221	104	9	(a)1405	360	
A. C. Jorgensen #3A	23.25R	1-6"				PLANT REMOVED							
A. C. Jorgensen #3	22.8R	1-12" 1-15"	2	111	127	233	217	135	62	10	(c)897	215	
A. C. Jorgensen #4	23.6R	1-8"	25		13	50	36	35	13		172	70	
Manuel A. Bettencourt	(d)24.2R	1-6"			46	24	26	7	15		118	40	
Warren F. McConnell	24.2L	1-5"				NO DIVERSION							
T. Nishihara	24.3R	1-5"				6	6		5		17	14	
Warren F. McConnell	24.5L	1-6"						23			23	42	
T. Nishihara	24.6R	1-6"			14	26	2	16	2		60	31	
T. Nishihara	25.0R	2-5"		8	4	35	39	15	8	5	114	46	
T. Nishihara	25.5R	1-6"			23	35	64	3	15		140	40	
Merced River Farms Assn.	26.3R	1-8"	5	74	118	125	176	116	125	16	(e)755	97	
W. C. Magneson	26.55R	1-5" 1-6"		9	6	9	15	7	?	3	(f) 58	31	
Carl Cunningham	26.8L	1-8"				NO DIVERSION							
--SANTA FE RAILROAD CROSSING - MILE 27.05--													
W. C. Magneson	27.5R	1-10"			1	29	261	17	208		516	135	
--CRESSEY BRIDGE - MILE 27.6--													
--GAGING STATION - MERCED RIVER AT CRESSEY - MILE 27.6--													
T. Nishihara	27.8R	1-4" 1-6"		11	5	7	9	9	8	2	51	30	
M. Uyekubo	28.1R	1-5"		6	9	3	4	12	7	2	43	20	
John Farie	28.4R	1-5"		5	14	17	14	5	9		64	18	
J. Campadonica	28.6R	1-6"		8		7	6	5	6		32	(g) 12	
Oliver Alves	28.6R	1-8"			48	32	57	40	46		223	80	
Anthony Demchille	29.1R	1-7"			23	27	44	25	19		(h)138	38	
Anthony Demchille	29.75R	1-6"			12	17	20	28	17	5	(i) 99	(j) 47	
Manuel Silva (High Lift)	29.9R	1-6"		8	9	24	27	23	18		109	75	
Manuel Silva (Low Lift)	29.9R	1-6"			50	7	17	4	1		79	70	
Rose and Shaffer (k)	30.7L	1-6"	2	27	39	60	26	48	24	5	231	58	
Manuel Silva	30.95R	1-12"		37	74	80	124	97	40	66	518	185	
Rose and Shaffer (k)	31.1L	1-8"		8	123	84	132	92	50	15	504	80	
Manuel Silva	31.5R	1-6"								44	(l) 44	13	
--SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) - MILE 32.52--													
Smith Bros. and Landers (m)	33.1R	1-6"		1	16	99	126	13	3		258	45	
Clyde Jones (n)	33.2L	1-2"				3	2	1			6	4	
Smith Bros. and Landers (m)	33.55R	1-6"		35	91	124	82	31	31		394	190	
W. F. Bettencourt, Joe Gomez Cowel Land Cement Co. (n)	36.9L	Gravity			900	871	900	901	871	900	(o)5343	1080	
Reinero Bros.	39.2L	1-24"				NO DIVERSION							
E. M. Davis (n)	40.2L	1-4"			13	41	71	67	43		235	60	
Totals			62	2479	3696	5296	5676	3652	2998	1778	25637	7941	
Average cubic feet per second			1	42	60	89	92	59	50	29	53		
Monthly use in per cent of seasonal			0.3	9.7	14.4	20.7	22.1	14.2	11.7	6.9			
Merced Irrigation District	(p)46.0L	Gravity											
Totals			737	73120	98762	101600	105694	86128	50989	850	(q)517880	108910	3990
Average cubic feet per second			12	1229	1606	1707	1719	1401	857	14			
Monthly use in per cent of seasonal			0.1	14.1	19.1	19.6	20.4	16.6	9.9	0.2			

(a) Additional acre-feet diverted: November 50.
(b) Formerly listed as Mile 23.3R.
(c) Additional acre-feet diverted: November 13.
(d) Formerly listed as Mile 23.8R.
(e) Additional acre-feet diverted: November 34.
(f) Additional acre-feet diverted: November 1.
(g) Acreage for 1948 should have been listed as 12 acres general crops.
(h) There is some exchange water between this plant and plant at Mile 29.75R.
(i) See plant at Mile 29.1R.
(j) Acreage listed for 1948 should have been 47 acres general crops.
(k) Formerly listed as Rose and Schaefer.
(l) Additional acre-feet diverted: January 11 and December 29.
(m) Formerly listed as Robert J. Ramsey.
(n) Not listed prior to 1949.
(o) Additional acre-feet diverted: November 523.
(p) Approximate mileage of the Crocker-Huffman Diversion Dam.
(q) Additional acre-feet diverted: January 462, February 280, November 194 and December 184. There is a monthly portion of this water diverted for users other than those of Merced Irrigation District. Additional water received from wells supplied by gravity canals.

TABLE 165

DIVERSIONS AND ACREAGES IRRIGATED - TUOLUMNE RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
E. T. Mapes	1.9R	1-20"	13	146	195	433	301	312	263	226	(a)1889	2650	
J. DeSouza and J. B. Silva	2.2R	1-6"		67	20	52	42	25	37		243	50	
Katheiser Bros.	3.1R	1-16"			6						(b) 6	42	
--GAGING STATION - TUOLUMNE RIVER AT TUOLUMNE CITY - MILE 3.35--													
Bancroft Fruit Farms	4.1R	1-12"		47	32	62	48	41	20		(c)250	75	
Bancroft Fruit Farms	5.0R	1-10"	5	70	110	115	137	138	47	42	(d)664	160	
Eugene Boone, Galen Hartwich and William Podesto	7.1R	1-10"		30	146	42	55	132	88	6	499	45	
W. F. Duffy	7.2R	1-7"		22	10	6	10	8	5	4	65	14	
Ella T. Rahilly	7.8L	1-10"	1	6	11	11	18	16	15		78	20	
W. F. Duffy	8.4R	1-10"	6	46	104	78	88	61	53	33	(e)469	108	
A. G. Watkins (f)	9.4L	1-12"				NO DIVERSION							
Tuolumne Cooperative Farms, Inc.	10.2R	1-10" 1-14"		32	74	93	81	64	8	21	(g)373	100	
G. B. and L. D. Podesto	15.75R	1-3"		3	4	4	5	4	1		21	17	
--OLD HIGHWAY BRIDGE - MILE 15.75--													
--SOUTHERN PACIFIC RAILROAD (MAIN LINE) - MILE 15.8--													
--GAGING STATION - TUOLUMNE RIVER AT MODESTO - MILE 15.92--													
--TIDEWATER SOUTHERN RAILROAD BRIDGE - MILE 15.92--													
--HIGHWAY 99 BRIDGE - MILE 16.05--													
--DRY CREEK CONFLUENCE - MILE 16.5R--													
Modesto Terminal Co. (h)	20.1R	1-8"		11	18	23	13	21	10		96	29	
L. R. Hughson	20.3R	1-8"	2	24	18	16	25	18	5		108	35	
R. L. Heimann (i)	20.5R	1-12"	3	27	18	37	31	64	34	14	(j)228	83	
--SANTA FE RAILROAD - MILE 21.6--													
George H. Johnson #2 (k)	27.1R	1-8"			15						15	(l)54	
George H. Johnson #1 (k)	27.3R	1-10"			4	4	10	14	26	20	78	54	
Dr. A. N. Tonge (k)	27.9R	1-12"		14	47	33	19	20	20		153	40	
Ronald R. Painter (k)	28.3R	1-7"			3	7	5	11			26	28	
J. W. and Lola May Short (m)	(n)28.7L	1-7"					2	2			(o) 4	10	
Michel Investment Co. (k)	28.8R	1-12"	9	34	59	89	89	77	72	18	447	150	
J. W. and Lola May Short (k)	29.4L	1-7"						3	2	1	(p) 6	55	
Firpo Ranch	30.2L	1-10"		42	18	68	76	64	41	16	(q)325	100	
--SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) MILE 31.5--													
--GAGING STATION - TUOLUMNE RIVER AT HICKMAN BRIDGE - MILE 31.7--													
A. G. Laughlin (k)	34.2R	1-6"			4	4	3	2	3		16	17	
A. E. Ketcham (k)	39.4R	1-8"		18	17	19	17	27	20	13	(r)131	50	
George H. Sawyer	39.8L	1-6"		6	29	59	62	49	36	9	(p)250	420	
--GAGING STATION - TUOLUMNE RIVER AT ROBERTS FERRY - MILE 39.9--													
--GAGING STATION - TUOLUMNE RIVER AT LA GRANGE - MILE 50.5--													
Totals			39	645	962	1255	1137	1173	806	423	6440	4406	
Average cubic feet per second			6	11	16	21	18	19	14	7	13		
Monthly use in per cent of seasonal			0.6	10.0	14.9	19.5	17.7	18.2	12.5	6.6			
Turlock Irrigation District (s)53.9L		Gravity											
Totals			729	11[illegible]00	108400	107900	86920	74970	56190	23010	(t)569519	157892	
Average cubic feet per second			12	1874	1763	1813	1414	1219	944	374	1172		
Monthly use in per cent of seasonal			0.1	19.6	19.0	18.9	15.3	13.2	9.9	4.0			
Modesto Irrigation District (s)53.5		Gravity											
Totals			3686	71314	58794	65004	46437	45919	30702	8880	(u,v)330736	(w,x)75735	(w)544
Average cubic feet per second			60	1199	956	1092	755	747	516	144	681		
Monthly use in per cent of seasonal			1.1	21.6	17.8	19.6	14.0	13.9	9.3	2.7			

(a) Additional acre-feet diverted: January 18, February 7, November 66 and December 16. Also receives water from controlled drainage of Modesto Irrigation District.
(b) Additional water received from Modesto Irrigation District.
(c) Additional acre-feet diverted: November 36.
(d) Additional acre-feet diverted: January 8, February 10 and November 35.
(e) Additional acre-feet diverted: November 15.
(f) Formerly listed as Leland Martin.
(g) Additional acre-feet diverted: December 20.
(h) Formerly listed as W. L. Bowron.
(i) Formerly listed as Ray L. Heimann Estate.
(j) Additional acre-feet diverted: November 10.
(k) Not listed prior to 1949.
(l) Combined acreage this plant and plant at Mile 27.3R.
(m) Formerly listed as L. DeMartini Co.
(n) Formerly listed at 29.6L. Moved to this location in 1949.
(o) Also receives water from Turlock Irrigation District.
(p) Also receives water from wells.
(q) Additional acre-feet diverted: November 8.
(r) Additional acre-feet diverted: November 4.
(s) Approximate mileage of La Grange Dam.
(t) Additional acre-feet diverted: January 622, February 636, November 912 and December 14370. Additional water received from wells supplied from gravity canals. Also receives an indeterminate amount of re-use controlled drainage.
(u) Additional acre-feet diverted: January 2991, February 1128, November 83 and December 2246. An indeterminate amount of water received from wells and controlled drainage.
(v) Includes diversion for Waterford Irrigation District.
(w) Acreage listing for 1948 should have been as follows: General crops 76305 and Rice 491.
(x) Includes 6210 acres irrigated lands of the Waterford Irrigation District.

TABLE 166

DIVERSIONS AND ACREAGES IRRIGATED - DRY CREEK - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Podesto and Arata	0.4R	1-6"	1	2	3	8	16	10	6		(a) 46	125	
--MODESTO-EMPIRE TRACTION COMPANY RAILROAD CROSSING - MILE 0.7--													
--HIGHWAY 110 YOSEMITE BOULEVARD BRIDGE - MILE 0.8--													
--LA LOMA BOULEVARD BRIDGE - MILE 1.2--													
James L. Melrose #1	5.0L	1-3"			2	3	2	1			8	5	
James L. Melrose #2	5.3L	1-6"				NO DIVERSION							
--CLAUSS ROAD BRIDGE AND GAGING STATION - MILE 5.4--													
--SANTA FE RAILROAD CROSSING - MILE 6.4--													
--CHURCH STREET BRIDGE - MILE 7.2--													
--WELLS FORD ROAD BRIDGE - MILE 8.7--													
Roy Brant	10.6R	1-5"				2	1			1	(a,b) 4	20	
--ALBERS ROAD BRIDGE - MILE 11.0--													
--MODESTO IRRIGATION CANAL CROSSING - MILE 11.1--													
Lucksinger Brothers	12.1R	1-6"				4	5	6			15	12	
John Lewis	12.6R	1-4"		8	15	3	33	39	33	3	134	100	
Lucksinger Brothers	12.7R	1-6"		1	2	1	2	1	6	5	(a) 18	30	
W. C. Hopper	12.9L	1-4"		4	2	4	2	4	2	2	20	6	
Harold D. Carver	14.4L	1-4"		1	3		2	1	2		9	16	
Joe Fagundes	14.7R	1-10"		108	122	175	168	126	118	106	(c)923	85	
H. H. French	17.2R	1-8"			2	13	28				52	22	
--SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) CROSSING - MILE 17.3--													
--OAKDALE-WATERFORD HIGHWAY BRIDGE - MILE 17.4--													
Totals			1	124	151	213	259	197	167	117	1229	421	
Average cubic feet per second				2	2	4	4	3	3	2	3		
Monthly use in per cent of seasonal			.1	10.1	12.3	17.3	21.1	16.0	13.6	9.5			

(a) Additional water received from Modesto Irrigation District.
(b) Additional acre-feet diverted: November 1.
(c) Additional acre-feet diverted: November 25.

TABLE 167

DIVERSIONS AND ACREAGES IRRIGATED - STANISLAUS RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
A. S. Machado (a)	1.1R	1-6"			5	5	15	15	8	4	52	27	
E. W. Hawkins (b)	1.8R	1-6"			23		28	14	5		70	35	
C. M. Carroll	2.9R	1-8"			34	14	20	22	24		114	40	
C. M. Carroll	3.0R	1-6"		11	15	19	17	17	17	10	(c) 106	35	
--GAGING STATION - STANISLAUS RIVER NEAR MOUTH - MILE 4.3--													
Adam Bianchi and (d) Thomas Madson	4.4R	1-18"						1	92	41	(e) 134	(f) 120	
N. Smallwood	(g) 4.7R	1-5"				NO DIVERSION							
Overton Ranch (D. F. Koetitz)	5.25L	2-12"		177	221	344	321	304	183		(h)1550	365	
Reclamation District #2064	5.9R	1-14" 1-16" (i)1-20"	17	1209	1275	1670	1676	1306	1076	576	8805	(j)1653	
Reclamation District #2075	5.95R	2-16" (k)1-20"		1877	1434	2052	2213	1820	1395	799	(l)11590	2540	
Henry Pelucca	6.7L	1-15"		171	67	106	162	166	49	13	734	107	
C. C. Updike (m)	8.2L	1-12"				26	19	12	56	81	(n) 194	125	
Caswell Brothers	9.8R	1-16"		246	163	308	264	241	184	97	1503	383	
N. E. Cannon	10.0R	1-10"		208	208	243	219	153	163	141	(o)1335	200	
D. F. Koetitz	10.1L	1-10"		76	124	233	207	220	206	36	(p)1102	308	
Joseph Hertle	10.5L	1-10"		50	18	62	44	39	45	18	276	100	
G. S. Tornell (d)	13.3R	1-6"				42	54	63	6		169	40	
D. Selby (q)	13.7L	1-4"		3	1	4		2			10	20	
R. V. Konenyburg (d)	13.9R	1-8"		29	22	44	38	45	32	18	(r) 228	54	
--SOUTHERN PACIFIC RAILROAD BRIDGE (MAIN LINE) - MILE 15.9--													
--GAGING STATION - STANISLAUS RIVER NEAR RIPON - MILE 16.0--													
--HIGHWAY 99 BRIDGE - MILE 16.0--													
A. Girardi	17.0L	(s)1-16"		1	237	177	178	329	101	12	(t)1035	370	
Edward B. Regan	18.5R	1-10"		66	40	101	69	85	54	6	421	181	
Edward B. Regan (q)	19.4R	1-6"					11				11	15	
Allen Ranch	20.75R	1-14"		388	419	336	364	300	256	29	2092	380	
Heath Ranch	20.9L	1-5"			22	9	14	12	11	9	77	16	
B. Bonora	21.75R	1-10"					101	23	142		266	110	
Slate and Jardine	22.3R	1-10"				PLANT REMOVED							
George Dahlgren (d)	24.8R	1-5"			17	49	66	82	23		237	130	
--MODESTO-ESCALON BRIDGE - MILE 28.15--													
--SANTA FE RAILROAD CROSSING - MILE 31.85--													

(a) Formerly listed as Chris Baron.
(b) Formerly listed as E. W. Hawkins (Mrs.).
(c) Additional acre-feet diverted: November 1.
(d) New installation in 1949.
(e) Additional acre-feet diverted: November 5.
(f) Prior to September 1949 this acreage served by plant at Mile 5.9R.
(g) Formerly listed at Mile 4.0R.
(h) Additional acre-feet diverted: November 100.
(i) The 20" unit was listed as 16" unit in 1949.
(j) An additional 120 acres at Mile 4.4R served by this plant until September 1949.
(k) New 20" unit installed in 1949.
(l) Additional acre-feet diverted: November 94 and December 15.
(m) Formerly listed as C. C. Updike (Mrs.).
(n) Additional acre-feet diverted: November 9.
(o) Additional acre-feet diverted: January 23, February 9 and November 8.
(p) Additional acre-feet diverted: November 8.
(q) Not listed prior to 1949.
(r) Additional acre-feet diverted: November 2.
(s) Replaces 12" unit formerly listed at this location.
(t) Received additional water from Modesto Irrigation District. Additional acre-feet diverted: November 2.

TABLE 167 (CONT'D)

DIVERSIONS AND ACREAGES IRRIGATED - STANISLAUS RIVER - 1949

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--GAGING STATION - STANISLAUS RIVER AT RIVERBANK - (BURNEYVILLE BRIDGE) - MILE 32.0--													
O. B. Trette (a)	32.1R	1-2" 1-4"			2	4	9	9			24	12	
R. P. Barton (b)	34.6R	1-7"	11	21	13	51	25	2			(c)123	102	
Oakdale Irrigation District (Crawford Pump)	(d)35.9L	1-14"	13	132	205	137	239	226	51	16	1019	(e)622	
Oakdale Irrigation District (Brady Pump)	(d)37.0L	1-12"		82	96	112	158	140	72	34	694	(f)458	
--SOUTHERN PACIFIC RAILROAD (OAKDALE BRIDGE) - MILE 39.0--													
--GAGING STATION - STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE - MILE 44.7--													
Totals			41	4747	4661	6152	6531	5648	4251	1940	33971	8548	
Average cubic feet per second			1	80	76	103	106	92	71	32	70		
Monthly use in per cent of seasonal			.2	14.0	13.7	18.1	19.2	16.6	12.5	5.7			
South San Joaquin Irr. Dist.	(g)50.2	Gravity											
Totals			10257	33398	49148	42788	31850	28737	4394		(h)200572	(i)64065	
Average cubic feet per second			167	561	799	719	518	467	74		413		
Monthly use in per cent of seasonal			5.1	16.7	24.5	21.3	15.9	14.3	2.2				
Oakdale Irr. Dist.	(g)50.2	Gravity											
Northside Canal Totals			246	13058	17122	15547	12492	11883	1000	246	(j) 71594	(k)51365	(k)1987
Average cubic feet per second			4	219	278	261	203	193	17	4			
Monthly use in per cent of seasonal			.3	18.2	23.9	21.8	17.5	16.6	1.4	.3			
Southside Canal Totals				20504	27381	26489	19321	16870	2965		113530	(k)	(k)
Average cubic feet per second				345	445	445	314	275	50				
Monthly use in per cent seasonal				18.1	24.1	23.3	17.0	14.9	2.6				

(a) New installation in 1949.
(b) Not listed prior to 1949.
(c) Additional acre-feet diverted: November 10 and December 19.
(d) Oakdale Irrigation District for season of 1949 maintained plants at Miles 35.9L and 37.0L to supplement District gravity supply.
(e) Of this figure 231 acres was double cropped.
(f) Of this figure 39 acres was double cropped. Also receives water from wells.
(g) Mileage listed is approximate mileage of Goodwin Dam.
(h) Additional acre-feet diverted: January 1225 and February 14479. During the last three years the irrigation season was terminated in September because of water supply. Had the water supply been firm, diversion for South San Joaquin Irrigation District would have extended to November 1 for these three years.
(i) Includes 10219 acres served by sub-irrigation. Received some water from controlled drainage and deep wells.
(j) Additional acre-feet diverted: January 246, February 222, November 2382 and December 246.
(k) This is combined acreage for both Northside and Southside Canals. Additional acreages served from plant on Stanislaus River at Miles 35.9L and 37.0L.

TABLE 168

DIVERSIONS AND ACREAGES IRRIGATED - TULE RIVER - 1949

Table Extended on Opposite Page

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
1	Pioneer Ditch	0.3R	Gravity	606	635	542	911	1
2	--WORTH BRIDGE GAGING STATION - MILE 2.2--							2
3	Campbell-Moreland Ditch	3.2L	Gravity	1239	1287	879	1097	3
4	Porter Slough	3.2R	Gravity	198	76	84	2400	4
5	Porter Slough Ditch Company	(h)3.2R	Gravity				893	5
6	Vandalia Ditch	3.9L	Gravity	264	272	70	203	6
7	--SANTA FE RAILROAD CROSSING - MILE 5.9--							7
8	Poplar Ditch	6.6L	Gravity	146	165	2294	2456	8
9	--HIGHWAY 65 BRIDGE - MILE 6.7--							9
10	--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 6.8--							10
11	Hubbs-Miner Ditch	7.2R	Gravity	36	580	772	1480	11
12	Rhodes-Fine Ditch	9.2L	Gravity				800	12
13	--OLIVE AVENUE BRIDGE - MILE 10.7--							13
14	--FRIANT KERN CANAL CROSSING - MILE 11.3--							14
15	Woods-Central Ditch	11.8L	Gravity				140	15
16	--ROCKFORD AVENUE BRIDGE - MILE 12.6--							16
17	--HUBBS-MINER SPILL - MILE 12.9R--							17
18	--GAGING STATION - TULE RIVER ABOVE LITTLE PIONEER DITCH - MILE 14.4--							18
19	Little Pioneer Ditch	15.0L	Gravity				153	19
20	--OTTLE BRIDGE - MILE 15.2--							
21	Totals			2489	3015	4641	10533	21
22	Average Cubic Feet per Second			40	54	75	177	22
23	Monthly Use in Per Cent of Seasonal			7.0	8.5	13.1	29.8	23

* Mileage indicated is miles downstream from Junction with South Fork of Tule River.

(a) With a firm water supply throughout the entire year, the use of water from the Tule River would extend throughout the entire 12 months of the year. Additional water received from wells. Wells are for supplemental water in the early part of irrigation season and are the total source of water as the flow in the Tule River diminishes. From March 19 to April 10 each year, all the flow of the Tule River excluding stock use, is for use by those diverters below Ottle Bridge.

(b) November and December partially estimated.

(c) There is total service area of 2460 acres.

(d) Of this figure 300 acres was double cropped.

(e) Served some water to 178 acres of the Vandalia Irrigation District at Mile 3.9L. An indeterminant amount of this water diverted and used for replenishment of ground water.

(f) There is a total service area of 1300 acres.

(g) Uses other than for replenishing of ground water is negligible.

Item No.	Monthly Diversions in Acre-Feet								(a)Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.-	Dec.		General	Rice
1	1171	934	38				200	300	(b)5337	(c)(d)1699	
2											
3	1556	443	24				226	477	(e)7228	(f)922	
4	1154								(g)3912	(g)	
5.	690								1583	(i)(j)786	
6	307	24					152	288	(k)(l)1580	178	
7											
8	3119	514							8694	(m)4343	
9											
10											
11	2102	280							5250	(n)(o)(p)2208	
12	674								1474	(q)(r)1000	
13											
14											
15									(s)140	(t) 5	
16											
17											
18											
19									(t)(u)153	(v) 30	
20											
21	10773	2195	62				578	1065	35351	11472	
22	175	37	1				10	17	48		
23	30.5	6.2	0.2				1.6	3.0			

(h) Point of diversion is on Porter Slough 4.5 miles from head of slough.
(i) There is a total service area of 1576 acres.
(j) Of this figure 160 acres was double cropped.
(k) An indeterminant amount of water used to replenish ground water.
(l) Received additional water from Campbell-Moreland Ditch Mile 3.2L.
(m) There is a total service area of 7440 acres.
(n) There is a total service area of 2295 acres which includes 1935 acres in the Hubbs-Miner Ditch Co. and 360 acres in the Gilliam-McGee Ditch Co.
(o) Includes 1858 acres in Hubbs-Miner Ditch Co. and 350 acres in Gilliam-McGee Ditch Co.
(p) Of this figure 20 acres was double cropped.
(q) There is a total service area of 1180 acres.
(r) Of this figure 100 acres was double cropped.
(s) Major portion of this water was used in canal storage.
(t) There is a total service area of 2360 acres.
(u) Some water furnished to outside users adjacent to service ditch.
(v) There is a total service area of 1020 acres.

TABLE 169

AVERAGE MONTHLY DIVERSIONS IN PER CENT OF SEASONAL FOR SACRAMENTO AND SAN JOAQUIN VALLEY STREAMS

	Period of Record	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
SACRAMENTO VALLEY									
Sacramento River - Redding to Sacramento	1939 to 1949	0.8	6.7	17.7	18.8	20.8	19.8	11.5	3.9
Feather River - Oroville to Mouth	1939 to 1949	0.1	4.5	17.8	19.3	20.8	19.2	12.3	6.0
Yuba River - Smartville to Mouth	1939 to 1949	0.2	4.8	14.2	17.1	18.3	17.8	15.2	12.4
American River - Fairoaks to Mouth	1939 to 1949	1.0	2.7	6.4	20.2	28.2	22.0	15.1	4.3
DELTA UPLANDS									
Old San Joaquin River	1939 to 1949	2.9	9.5	16.2	17.4	20.8	17.1	11.1	5.0
Tom Paine Slough	1939 to 1949	1.6	8.8	14.9	17.4	19.6	18.8	14.2	4.6
San Joaquin River - Vernalis to Stockton	1939 to 1949	3.5	12.5	15.3	14.4	22.0	18.8	9.7	3.6
SAN JOAQUIN VALLEY									
San Joaquin River - Fremont Ford Bridge to Vernalis	1939 to 1949	3.2	11.0	15.4	15.6	22.1	18.7	11.1	2.8
San Joaquin River - Friant to Fremont Ford Bridge	1939 to 1949	6.3	12.2	13.7	14.6	14.5	15.4	11.9	8.1
Merced River - Yosemite Valley Railroad Crossing to Mouth	1939 to 1949	1.0	6.6	13.7	18.9	24.2	19.4	12.3	3.7
Tuolumne River - La Grange to Mouth	1939 to 1949	2.1	7.9	15.8	17.5	19.4	18.9	13.2	5.1
Stanislaus River - Orange Blossom to Mouth	1939 to 1949	1.6	8.6	14.7	17.9	20.1	18.7	12.7	5.6

TABLE 170

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 to 1949

SACRAMENTO RIVER - SACRAMENTO TO REDDING

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	63636	202428	227491	233319	230319	209735	90708	43412	1301048
1940	1802	18073	182534	218505	249012	228765	119951	43988	1062630
1941	1883	5274	157567	228387	265229	259557	177189	55029	1150115
1942	1991	11727	187657	268091	286655	278848	186708	61298	1278975
1943	1769	61409	257673	276759	288930	288024	190456	51915	1416935
1944	3236	155666	310227	305633	338429	318184	180858	65917	1678150
1945	2134	117302	316912	305333	346868	326148	200601	60473	1675771
1946	7968	187267	333991	328508	341952	326956	179671	71666	1777979
1947	2743	167131	346326	313389	344334	326100	170785	36296	1707104
1948	53935	16451	251478	271737	365701	351666	217464	65042	1593474
1949	2389	167438	344764	349497	390112	359905	173205	85391	1872701
Average Acre-Feet	13044	100924	265147	281742	313413	297626	171600	58221	1501353
Average c.f.s.	212	1696	4312	4735	5097	4840	2884	947	12180
Monthly Diversion in per cent of Seasonal	0.9	6.6	17.7	18.8	20.9	19.8	11.4	3.9	

* See 1946 Water Supervision Report for prior years.

TABLE 171

ANNUAL COMPARATIVE MONTHLY DIVERSIONS IN ACRE-FEET 1939 to 1949

FEATHER RIVER - OROVILLE TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	3583	71539	99567	90960	92044	83292	37752	22620	501357
1940	188	2207	84408	95502	105337	93454	59182	33695	473973
1941	0	2448	70513	72971	103334	100433	78451	47090	475240
1942	0	0	61352	113416	125530	122146	86814	30435	539693
1943	0	13290	101599	125318	131210	123282	93309	35495	623503
1944	205	43792	130779	126206	142128	133130	85924	50747	712911
1945	0	26056	130729	133918	142224	132832	92953	39682	698394
1946	47	53967	156398	140210	145235	132948	82010	33985	744800
1947	90	30240	152827	130731	138055	124426	77215	20873	674403
1948	3181	5717	66373	127596	140904	120658	85122	36722	586273
1949	0	57396	146342	141278	137822	126739	59327	47400	716304
Average Acre-Feet	663	27877	109172	118010	127620	117576	76187	36249	613350
Average c.f.s.	11	469	1775	1983	2076	1912	1281	589	1262
Monthly Diversion in per cent of Seasonal	0.1	4.6	17.8	19.2	20.8	19.2	12.4	5.9	

* See 1946 Water Supervision Report for prior years.

TABLE 172

ANNUAL COMPARATIVE MONTHLY DIVERSIONS IN ACRE-FEET 1939 to 1949

YUBA RIVER - SMARTVILLE TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	176	8986	13174	12890	12889	12739	8304	3955	73113
1940	0	1326	9377	14114	15190	11798	10780	7383	69968
1941	0	2624	10589	13076	13574	13419	10672	9576	73530
1942	0	36	5703	14736	14955	14841	13086	11349	74706
1943	0	1903	10622	15237	17203	16972	16610	15252	93799
1944	1665	7327	13857	15601	16786	15532	13311	9185	93264
1945	0	4338	9815	15479	14112	13848	13046	13590	84228
1946	0	7222	15231	15845	17082	16356	13940	13010	98686
1947	0	3820	17316	16339	17364	19152	15577	10517	100085
1948	33	23	12350	13849	17305	17954	16994	14256	92764
1949	0	9062	18933	17288	19416	17890	13338	10920	106847
Average Acre-Feet	170	4242	12452	14950	15989	15500	13242	10818	87363
Average c.f.s.	3	71	203	251	260	252	222	176	180
Monthly Diversion in per cent of Seasonal	0.2	4.9	14.3	17.1	18.3	17.6	15.2	12.4	

* See 1946 Water Supervision Report for prior years.

TABLE 173

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 to 1949

AMERICAN RIVER - FAIROAKS TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	73	380	932	1616	1699	1151	557	246	6654
1940	44	339	488	1216	1785	1038	686	456	6052
1941	150	253	379	836	1531	1202	673	285	5309
1942	0	0	13	678	1395	1187	789	104	4166
1943	0	0	54	941	1513	1226	753	94	4581
1944	0	6	113	980	1566	1211	790	153	4819
1945	0	8	119	909	1017	894	760	149	3856
1946	0	10	228	1022	1104	889	766	105	4124
1947	308	422	483	1113	1193	1086	1071	237	5913
1948	92	34	209	866	1737	1420	1030	495	5883
1949	0	58	574	1269	1448	1239	724	200	5512
Average Acre-Feet	61	137	327	1041	1453	1140	782	229	5170
Average c.f.s.	1	2	5	17	24	18	13	4	11
Monthly Diversion in per cent of Seasonal	1.2	2.7	6.3	20.1	28.1	22.1	15.1	4.4	

* See 1946 Water Supervision Report for prior years.

TABLE 174

ANNUAL COMPARATIVE MONTHLY DIVERSIONS IN ACRE-FEET 1939 to 1949

OLD SAN JOAQUIN RIVER - DELTA UPLANDS

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	7728	12880	8746	12055	13453	9855	4977	1669	71363
1940	0	1015	9527	10943	14091	10217	6148	3306	55247
1941	0	447	5492	11541	13087	10009	7382	2909	50867
1942	0	516	7175	11077	13143	11425	6740	2878	52954
1943	0	2048	11293	12463	13745	11945	7568	3104	62166
1944	2921	11827	13918	13224	16911	15667	10753	4694	89915
1945	595	7544	16791	17092	19809	14818	10873	4433	91955
1946	4640	14371	17736	16948	19662	18238	9914	4927	106436
1947	1637	15687	18983	15788	19269	14525	9633	3105	98627
1948	11808	4765	18259	15460	21943	21547	14574	7029	115385
1949	1941	17522	22945	23207	25229	19779	14272	9521	134416
Average Acre-Feet	2843	8057	13715	14527	17304	14366	9349	4325	84485
Average c.f.s.	47	135	223	245	282	234	157	70	174
Monthly Diversion in per cent of Seasonal	3.4	9.5	16.2	17.2	20.5	17.0	11.1	5.1	

* See 1946 Water Supervision Report for prior years.

TABLE 175

ANNUAL COMPARATIVE MONTHLY DIVERSIONS IN ACRE-FEET 1939 to 1949

TOM PAINE SLOUGH - DELTA UPLANDS

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	763	1620	1218	1703	1414	1789	1015	645	10167
1940	0	159	1509	1974	2129	1612	1133	873	9389
1941	0	0	1406	1972	2163	1788	1704	529	9562
1942	0	0	1292	1852	2434	1930	1158	278	8944
1943	0	891	2526	2728	2629	2578	2041	589	13982
1944	84	1630	2186	2466	3046	2852	2487	1019	15770
1945	34	539	2527	2792	2891	3153	2144	377	14427
1946	874	2588	2756	3145	3324	3732	2490	798	19707
1947	74	3064	3136	3319	3735	3487	2816	414	20045
1948	629	998	2795	2866	4327	4222	3422	953	20212
1949	155	3534	3114	3570	4324	4017	3226	1362	23302
Average Acre-Feet	238	1366	2224	2581	2947	2833	2149	712	15046
Average c.f.s.	4	23	37	44	48	46	36	12	31
Monthly Diversion in per cent of Seasonal	1.6	9.1	14.8	17.1	19.6	18.8	14.3	4.7	

* See 1946 Water Supervision Report for prior years.

TABLE 176

ANNUAL COMPARATIVE MONTHLY DIVERSIONS IN ACRE-FEET 1939 to 1949

SAN JOAQUIN RIVER-DELTA UPLANDS - STOCKTON TO VERNALIS

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	4012	9394	5398	6901	11721	8744	3862	1178	51210
1940	4	4638	6974	7011	12805	7978	3300	1932	44642
1941	4	1086	6162	5944	12007	8735	4384	1762	40084
1942	188	2232	5210	6602	12203	9651	4014	2085	42185
1943	0	3169	10172	8940	11617	10886	5142	1793	51719
1944	1110	10346	8439	8039	11349	11489	6261	2275	59308
1945	7	6476	12035	9658	13109	12537	7090	1793	62705
1946	5246	13974	10681	9238	15347	13071	6727	2875	77154
1947	5322	13337	14168	11615	15439	14676	7782	2052	84391
1948	6012	4564	9919	8251	13912	13356	7911	2682	66607
1949	1227	13434	11893	13141	14933	12382	7857	3768	78635
Average Acre-Feet	2012	7514	9186	8667	13131	11228	5848	2200	59876
Average c.f.s.	35	126	149	146	214	183	98	36	123
Monthly Diversion in per cent of Seasonal	3.4	12.6	15.3	14.5	21.9	18.8	9.8	3.7	

* See 1946 Water Supervision Report for prior years.

TABLE 177

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 to 1949

SAN JOAQUIN RIVER - VERNALIS TO FREMONT FORD BRIDGE

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	7044	17485	17212	18955	25161	21288	10366	2505	120016
1940	555	4547	15524	18950	26396	17707	10769	3365	97813
1941	0	302	13633	15486	26484	20840	12725	3947	93417
1942	573	2014	14158	17059	28352	25384	12575	4235	104380
1943	0	4417	20849	20115	29913	25046	16595	4789	121724
1944	4790	21177	22013	20102	27066	24430	14554	4128	138260
1945	1327	14036	21325	21383	30463	25540	15202	2087	131363
1946	6967	21399	24961	23751	32002	28792	17026	5144	160042
1947	11658	31645	28072	27725	34079	27812	17318	3049	181358
1948	12902	18449	21647	15487	28830	27888	15926	3398	144527
1949	852	27448	26456	27787	33889	26998	18376	5054	166860
Average Acre-Feet	4243	14814	20532	20618	29330	24702	14676	3791	132705
Average c.f.s.	69	249	334	346	477	402	246	62	273
Monthly Diversion in per cent of Seasonal	3.2	11.2	15.4	15.5	22.1	18.6	11.1	2.9	

* See 1946 Water Supervision Report for prior years.

TABLE 178

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 to 1949

MERCED RIVER - YOSEMITE VALLEY RAILROAD CROSSING TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	38	951	1791	2162	2520	1803	808	236	10309
1940	2	220	1541	2275	2206	1597	949	317	9107
1941	0	0	870	1614	1995	1537	1306	236	7588
1942	0	14	475	1619	2716	2005	1207	363	8399
1943	0	198	1782	2249	3077	2258	1680	474	11718
1944	84	1117	1845	2535	2561	2466	2071	820	13501
1945	30	558	1696	2292	3058	2500	1552	132	11818
1946	231	1380	1595	2393	3608	2787	1720	684	14398
1947	228	2863	3128	3420	4322	4077	2499	529	21066
1948	931	328	2321	2634	4899	4162	1953	534	17762
1949	62	2479	3696	5296	5676	3652	2998	1778	25637
Average Acre-Feet	146	919	1885	2593	3331	2622	1704	555	13755
Average c.f.s.	3	16	31	44	54	43	28	9	28
Monthly Diversion in per cent of Seasonal	1.1	6.7	13.7	18.8	24.2	19.1	12.4	4.0	

* See 1946 Water Supervision Report for prior years.

TABLE 179

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 to 1949

TUOLUMNE RIVER - LA GRANGE BRIDGE TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	160	149	414	501	455	558	193	104	2534
1940	3	19	577	415	642	436	335	151	2578
1941	0	122	519	685	603	607	438	173	3147
1942	7	75	443	462	645	683	343	112	2770
1943	0	116	354	541	542	520	360	183	2616
1944	80	304	517	665	778	801	656	300	4101
1945	33	463	535	630	748	723	376	47	3555
1946	216	565	765	734	940	889	559	254	4922
1947	283	893	1132	1112	1245	1135	1229	439	7466
1948	299	280	322	389	1275	1404	1032	233	6234
1949	39	645	962	1255	1137	1173	806	423	6440
Average Acre-Feet	102	330	640	717	819	812	575	220	4215
Average c.f.s.	2	6	11	12	13	14	9	3	8
Monthly Diversion in per cent of Seasonal	2.4	7.8	15.2	17.0	19.4	19.3	13.7	5.2	

TABLE 180

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 to 1949

STANISLAUS RIVER - ORANGE BLOSSOM BRIDGE TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	198	1848	2201	2873	3222	3310	1752	827	16231
1940	217	682	2143	3330	3858	2924	1741	851	15746
1941	12	392	2696	3173	3413	3228	2466	1280	16660
1942	240	356	2533	4242	4590	3972	2721	1360	20014
1943	3	873	3439	4241	4458	3935	3518	1598	22065
1944	186	2013	3266	3565	4246	4292	2659	1603	21830
1945	0	2664	3013	3869	4431	4136	2866	681	21660
1946	862	3316	3780	4563	5046	4832	2754	1655	26808
1947	1206	4320	4933	4644	5417	5085	3462	1008	30075
1948	1261	1114	4631	4826	6089	6070	4259	1455	29705
1949	41	4747	4661	6152	6531	5648	4251	1940	33971
Average Acre-Feet	384	2030	3391	4134	4664	4312	2950	1296	23160
Average c.f.s.	6	35	55	69	76	70	49	21	47
Monthly Diversion in per cent of Seasonal	1.7	8.8	14.7	17.8	20.1	18.6	12.7	5.6	

* See 1946 Water Supervision Report for prior years.

TABLE 181

COMPARATIVE SEASONAL DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1939-1949

Year		River Sections							Total Reach Redding to Sacramento
		Redding to Red Bluff	Red Bluff to Butte City	Butte City to Colusa	Colusa to Wilkins Slu	Wilkins Slu to Knights Ldg.	Knights Ldg. to Verona	Verona to Sacramento	
1939	Seasonal diversion acre-feet	141403	587358	29668	292226	89153	21496	139744	1301048
	Average cubic feet per second	291	1209	61	601	183	44	288	2677
	Acreage irrigated - rice	0	32917	750	17360	3667	0	9159	63853
	Acreage irrigated - general	13423	58185	6802	51711	13120	2727	12800	158768
1940	Seasonal diversion acre-feet	116052	479028	15683	249532	70974	34057	97304	1062630
	Average cubic feet per second	239	986	32	513	146	70	200	2187
	Acreage irrigated - rice	0	31754	463	19475	4024	1541	7134	64391
	Acreage irrigated - general	9696	43885	6354	41548	7318	1318	9611	119730
1941	Seasonal diversion acre-feet	135305	493667	16903	305187	95969	25970	77114	1150115
	Average cubic feet per second	278	1016	35	628	197	53	159	2367
	Acreage irrigated - rice	0	40183	530	30716	6786	1013	5968	85196
	Acreage irrigated - general	12205	45217	6772	37039	7923	980	8445	118581
1942	Seasonal diversion acre-feet	119216	553834	37714	335431	116200	26820	89760	1278975
	Average cubic feet per second	245	1140	78	690	239	55	185	2632
	Acreage irrigated - rice	0	49299	2668	39115	8957	660	6664	107663
	Acreage irrigated - general	13513	47696	5123	30095	5425	1476	7898	111226
1943	Seasonal diversion acre-feet	139086	594046	60963	333715	136688	35934	116503	1416935
	Average cubic feet per second	286	1222	125	687	281	74	240	2916
	Acreage irrigated - rice	0	55316	4275	35777	9299	1115	9817	115599
	Acreage irrigated - general	14362	43763	4765	29580	4594	1250	9052	107366
1944	Seasonal diversion acre-feet	155303	715850	77255	405665	142341	31565	150171	1678150
	Average cubic feet per second	320	1473	159	835	293	65	309	3453
	Acreage irrigated - rice	0	56620	5743	32161	14459	1573	11687	122242
	Acreage irrigated - general	15324	40614	4478	32591	8086	1997	8781	111868
1945	Seasonal diversion acre-feet	143229	690859	85269	409202	162825	21776	162521	1675771
	Average cubic feet per second	295	1432	175	842	335	45	334	3449
	Acreage irrigated - rice	0	48715	5574	34461	13094	795	12476	115115
	Acreage irrigated - general	15390	36103	4680	28843	9757	2506	9266	106545
1946	Seasonal diversion acre-feet	163925	729606	98953	402022	159077	38680	185716	1777979
	Average cubic feet per second	337	1501	203	827	327	80	382	3659
	Acreage irrigated - rice	0	53195	6445	30828	13995	2485	17187	124135
	Acreage irrigated - general	15373	38934	8719	30861	10923	2024	10722	117556
	Acre-feet per acre (a)	10.5	7.9	6.5	6.5	6.4	8.6	5.7	7.3
1947	Seasonal diversion acre-feet	138036	704544	103476	405829	140736	56993	157490	1707104
	Average cubic feet per second	284	1450	213	835	290	117	324	3513
	Acreage irrigated - rice	0	56080	7393	31584	12549	2688	13687	123981
	Acreage irrigated - general	17517	38149	4361	33853	11070	2982	13658	121590
	Acre-feet per acre (a)	7.7	7.5	8.8	6.2	6.0	10.1	4.7	6.8
1948	Seasonal diversion acre-feet	154758	632230	92661	387490	132701	56342	137292	1593474
	Average cubic feet per second	318	1301	191	797	273	116	283	3279
	Acreage irrigated - rice	0	53477	8299	33503	12125	1568	15145	124811
	Acreage irrigated - general	18421	52944	7860	35760	12685	3947	18117	149734
	Acre-feet per acre (a)	8.3	5.9	5.7	5.6	5.3	10.2	3.3	5.7
1949	Seasonal diversion acre-feet	179750	758697	96498	396587	189604	69658	181907	1872701
	Average cubic feet per second	370	1561	199	816	390	143	374	3854
	Acreage irrigated - rice	0	56207	8080	35148	14891	7337	14341	137269
	Acreage irrigated - general	18375	48721	6532	37584	12431	5511	15606	143495
	Acre-feet per acre (a)	9.6	7.2	6.6	5.5	6.9	5.4	5.1	6.6
	Average 1939 - 1949								
	Seasonal diversion acre-feet	144188	630883	65004	356626	130570	38117	135957	1501353
	Average cubic feet per second	297	1299	134	734	269	78	280	3090
	Per cent of total reached	9.6	42.0	4.3	23.8	8.7	2.5	9.1	
	Acreage irrigated - rice	0	48524	4565	30948	10350	1889	11206	107656
	Acreage irrigated - general	14872	44928	6040	35406	9394	2429	11269	124224

(a) Excluding such diversions for municipal use as the City of Sacramento and the City of Redding.

TABLE 182

RICE ACREAGE IN CALIFORNIA

A Comparison of Total Rice Acreage in California with Rice Acreage Irrigated from the Sacramento and San Joaquin River Systems Covered by Sacramento-San Joaquin Water Supervision

Rice Acreage							
Year	Total in State	Irrigated from Sacramento & San Joaquin River Systems	Ratio in Per Cent (b)	Year	Total in State (a)	Irrigated from Sacramento & San Joaquin River Systems	Ratio in Per Cent (b)
1924	90000	89000	99	1937	149000	109000	73
1925	103000	95000	92	1938	125000	95000	76
1926	149000	129000	87	1939	120000	104000	87
1927	160000	123000	77	1940	118000	94000	80
1928	132000	101000	76	1941	153000	120000	78
1929	95000	74000	78	1942	212000	159000	75
1930	110000	88000	80	1943	237000	186000	77
1931	125000	126000	100	1944	246000	200000	81
1932	110000	91000	83	1945	239000	187000	78
1933	108000	87000	80	1946	255000	200000	78
1934	108000	92000	85	1947	250000	215000 (c)	86
1935	100000	78000	78	1948	248000	193000	81
1936	138000	104000	75	1949	298000	236200	79
				Average 1924-1949	160700	129800	81

(a) As reported by Federal-State Crop Reporting Service.
(b) Ratio of acreage on Sacramento and San Joaquin River systems to total State acreage.
(c) Prior to 1947 rice acreage on Upper San Joaquin River was not included.

TABLE 183

MAXIMUM RECORDED SALINITY AT PRESENTLY INDICATIVE BAY AND DELTA STATIONS

1939 - 1949, INCLUSIVE (a)

YEAR	1939	1940	(e)1941	1942	1943	1944	1945	1946	1947	1948	1949
Sacramento-San Joaquin Runoff in percent of Normal (b)	43	115	137	129	114	56	86	92	54	78	63
Station (d)	Maximum Recorded Salinity in Parts of Chlorine per 100,000										
						San Francisco, San Pablo and Suisun Bays					
Point Orient	1920	1840				1730	1800	1740	1880	1740	1770
Point Pinole								1530	1680	1500	1570
Point Davis	1840	1760				1520	1340	1660	1650	c1420	1510
Grand View						1530	1430	1500	1800	1330	1460
Crockett								1400	1790	1330	1460
Benicia						1390	1230	1200	1510	1130	1240
Martinez							c1000	1110	1340	1260	1160
West Suisun								1020	1350	1180	1000
Port Chicago								950	1240	930	1060
Nichols								800	1160	740	f560
O & A Ferry	1180	720				730	260	350	610	360	400
Innisfail Ferry	1360	790				790	440	450	820	440	530
Pittsburg							160	210	500	170	330
						Sacramento River Delta					
Collinsville	1040	450	195	190	340	470	114	170	450	179	250
Three Mile Slough Bridge	590					161	7	8	125	13	20
Rio Vista Bridge	405					55	4	5	27	12	15
Isleton Bridge	250					5	3	5	5	7	5
						Mokelumne River Delta					
Terminous										11	11
Southwest Point	86									6	f6
						San Joaquin River Delta					
Winter Island							123	133	c490	127	228
Antioch	920	440	158	140	312	400	96	109	470	150	192
Millers Harbor							64	93	300	44	160
Jersey Island	500										25
Webb Pump	265	27				52	5	8	45	10	14
Opposite Central Landing	138	15				20	5	8	20	9	10
Dutch Slough	225	42				69	8	13	84	12	34
Orwood Bridge	54									18	16
East Contra Costa I. D.	32					14	11	20	19	32	21
Victoria								11	19	20	21
Clifton Court Ferry	19								16	23	18
Stockton Country Club	32									26	17
Garwood Bridge										15	18
South Fabian									19	26	21
Williams Bridge										15	19
Grant Line Bridge									17	22	19
Mossdale	16	14				13	10	12	18	25	18
At Vernalis									c18	24	17

(a) For maximum salinities recorded 1924-1938 see previous reports.
(b) Normal taken as 50-year mean (1889-1936) of natural runoff at foothill stations of major tributaries.
(c) Estimated.
(d) For location and description see Table 184.
(e) Sampling by State discontinued in 1941 and resumed in 1944 in cooperation with the U. S. Bureau of Reclamation.
(f) Record incomplete.

TABLE 184

DESCRIPTION OF ACTIVE SALINITY OBSERVATION STATIONS - 1949

(Refer to previous Water Supervision Reports for description of stations which have been discontinued.)

STATION	Miles from Golden Gate (a)	Time Interval (b)		LOCATION
		Hours	Mins.	
				SAN FRANCISCO, SAN PABLO AND SUISUN BAYS
Point Orient	12.3	2	20	North end of San Francisco Bay, East Shore, one-half mile south of Point San Pablo Wharf of Standard Oil Company.
Point Pinole	19.0	2	50	South Shore of San Pablo Bay, at Point Pinole on wharf of Atlas Powder Company.
Hercules	22.7	3	10	South Shore of San Pablo Bay, at Refugio Point on wharf of Hercules Powder Company.
Point Davis	25.2	3	15	East end San Pablo Bay, South Shore, Oleum Wharf of Union Oil Company.
Grand View	25.2	3	15	Northwest shore of San Pablo Bay at mouth of Petaluma Creek.
Crockett	27.7	3	30	West end of Carquinez Strait, South Shore, 0.2 mile east of Carquinez Bridge on wharf of C. and H. Sugar Refining Corporation.
Benicia	32.5	3	50	East end of Carquinez Strait, North Shore, 1.1 mile west of Southern Pacific Company railroad bridge, at Benicia Arsenal.
Martinez	32.7	3	50	East end of Carquinez Strait, South Shore, 1.0 mile west of Southern Pacific Company railroad bridge, at Municipal Ferry Slip.
West Suisun	37.0	4	10	West end of Suisun Bay, North Shore, 2.5 miles northeast of Southern Pacific railroad bridge at service pier of U. S. Maritime Commission, Reserve Fleet Mooring area.
Port Chicago	41.0	4	20	South Shore of Suisun Bay at U. S. Naval ammunition loading wharf below Port Chicago.
Nichols	42.7	4	25	South Shore of Suisun Bay, on Middle Point at Wharf of General Chemical Company.
O & A Ferry	46.5	4	40	Upper end Suisun Bay between Mallard Station and Chipps Island at Sacramento Northern Railroad Ferry Crossing.
Innisfail Ferry	47.3	4	50	Montezuma Slough, about one mile east of junction with Cutoff Slough near North end of Grizzly Island.
Pittsburg	48.0	5	00	East end of Suisun Bay, South Shore, at Pittsburg Yacht Harbor.
				SACRAMENTO RIVER DELTA
Collinsville	50.8	5	25	Sacramento River, North Bank at junction with San Joaquin River.
Three Mile Slough Bidge	60.0	5	55	At junction of Slough and Sacramento River.
Rio Vista Bridge	63.5	6	05	At Highway Bridge near northerly limits of Rio Vista.
Isleton Bridge	68.7	6	30	Sacramento River, one mile upstream from Isleton.
				MOKELUMNE RIVER DELTA
Southwest Point	78.8	7	25	Staten Island, North Fork Mokelumne River, South Bank, just above junction with South Fork.
Terminous	83.4	7	50	South Fork Mokelumne River at Terminous.
				SAN JOAQUIN RIVER DELTA
Winter Island	53.1	5	50	Upper end of Winter Island, north shore New York Slough at junction of Broad and New York Sloughs.
Antioch	54.9	5	55	San Joaquin River, at City Water Works pumping plant.
Millers Harbor	58.2	6	10	South Shore San Joaquin River at Antioch Bridge.
Webb Pump	72.0	7	00	False River, two miles below Old River Junction.
Opposite Central Landing	72.0	7	00	Mokelumne River, on Andrus Island directly opposite Central Landing on Bouldin Island.
Dutch Slough	73.0	7	05	At Bethel Island Bridge.
Orwood Bridge	86.3	8	10	Old River, at Santa Fe Railroad Crossing, Orwood.
East Contra Costa Irr. Dist.	86.7	8	20	Indian Slough, at East Contra Costa Irrigation District Pumping plant.
Victoria Island	89.6	8	35	Old River at Borden Highway Crossing.
Clifton Court Ferry	94.2	9	10	Old River just below junction with Grant Line Canal.
Stockton Country Club	94.8	9	15	Near Head of Stockton Channel at Wharf of California Transporation Company.
Garwood Bridge	95.3	9	15	San Joaquin River, at Drawbridge one mile above Santa Fe Railroad Crossing.
South Fabian	100.0	9	40	Old River, two miles East of Bethany.
Grant Line Bridge	101.0	9	50	Grant Line Canal, 5.5 miles above junction with Old River, at Tracy Road Crossing.
Williams Bridge	101.6	9	55	Middle River, about four miles below Salmon Slough Junction.
Mossdale Bridge	108.5	10	50	San Joaquin River at U. S. 50 Highway Crossing about three miles southwest of Lathrop.
At Vernalis	127.0	11	00	San Joaquin River at Durham Ferry Bridge, above tidal influence.

(a) Mileage measured to station along main channel. For stations off the main channel, the mileage shown is the same distance along the main channel to a point whereon the time of the occurrence of the tidal phase is the same as that of the observation station.
(b) Time interval between high tide at Golden Gate and time for taking samples at station.

TABLE 185

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Station	January - 1949							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1460	1450	1610	1700	1570	1550	1440	1420
Point Pinole			1140				1330	
Point Davis		1000	1120	1270		1110	1100	a1000
Grand View	1010	1000	1020	1000	990	990	1010	990
Crockett	650	830	1010	1140	1050		a900	
Benicia	680	700	920	1040	740	830		690
Martinez	460	690	890	870	690	730		600
West Suisun	460	430	850	830	410	530	540	490
Innisfail Ferry	250	210	270	b350	a310	270	260	b250
Port Chicago	220	460	430	670	a580	720	530	b420
Nichols					410	480		
O & A Ferry	a15	150	150	180	110	210	120	90
Pittsburg	30	c20	15	60	23	20	20	40
Sacramento River Delta								
Collinsville	a7	6		57	a10	28	13	17
Three Mile Slough	2	2	3	3	1		3	4
Rio Vista Bridge	10	2	3	2	3	2	bkn	3
Isleton	2	a2	2	2	2	bkn	2	2
Mokelumne River Delta								
Terminous	7	a3	a6	a3	5	a3	a7	8
Southwest Point		3		6		4	2	3
San Joaquin River Delta								
Winter Island	25	7	29	76	26	39	31	20
Antioch	8	7	8		13	19	14	10
Millers Harbor	11	5	8	13	9	10	9	9
Opposite Central Landing	3	3	6	6	a7	10	6	a3
Dutch Slough	5	7	7	7	a7	7	9	9
Orwood Bridge		13	14	b15	14	15	14	16
East Contra Costa I. D.	a17	19	18	a12	ab13	19	18	a19
Victoria		13	19	17	14	13	12	12
Clifton Court Ferry	11	16	14	13	10	13	11	10
Stockton Country Club	11	10		a12		9	11	a10
Garwood Bridge	a11	13	12	a11	a8	7	a8	8
Williams Bridge	b11	12	16	16	11	12	8	11
South Fabian	a11	a14		ab11		10	ab8	a11
Grant Line Bridge	a9	a14	10	a7	12	9		a7
Mossdale	a11	10	a10	a6	a9	11	a12	a8
At Vernalis		b9			c8		c8	
	February - 1949							
San Francisco, San Pablo and Suisun Bays								
Point Orient	1420	1500	1510	1540	1490	1520	1430	
Point Pinole						1270		
Point Davis	880	840	1020	980	1020	1040	990	
Grand View	1010		990	1010		960	890	
Crockett	950	910	820	950	a680		910	
Benicia	710	560	690	790	650		650	
Martinez	540	880	a640	500	370	660	600	
West Suisun	240	470	570	350	520	500	370	
Innisfail Ferry	b250	230	160	180	140	140	170	
Port Chicago	b320	a480	460	260	440	570	370	
Nichols	300	370		180	20	40	320	
O & A Ferry	90	a130	80	40	40	130	50	
Pittsburg	10	10	10	10	10	10	10	
Sacramento River Delta								
Collinsville	10	6	6	9	7	13	8	
Three Mile Slough		4						
Rio Vista Bridge	4	1	4	2	10	2	1	
Isleton	a3	2	1	1	a2	1	1	
Mokelumne River Delta								
Terminous	ab5	a11	a6	7	a3	a3	e7	
Southwest Point			1			4		
San Joaquin River Delta								
Winter Island	15	15	10	10	8	15	11	
Antioch	12	8	7	9	9	11	9	
Millers Harbor	8	7	ab6	13	5	9	7	
Webb Pump				8	8	8		
Opposite Central Landing	7	3	5	a6	3	6		
Dutch Slough	9	9	8	8	9	9	8	
Orwood Bridge	b12	11	13	e13	12	14	14	
East Contra Costa I. D.	21	19	16	a16	17	b17	a17	
Victoria	10	9	13	13	11	bkn	21	
Clifton Court Ferry	9							
Stockton Country Club	9	9	10	a10	11	9	a11	
Garwood Bridge	8	11	10	a10	10	10	a13	
Williams Bridge	12		13	11	10	10	16	
South Fabian		12	11	a11	12	a12	b13	
Grant Line Bridge	8	11	10	a11	11	a12	a18	
Mossdale	12	12	a8	a9	10	13	a14	
At Vernalis		e11		a8				

(a) Taken at Low High Tide.
(b) Taken on following day.
(c) Taken two days later.
(e) Taken on preceding day.

TABLE 185 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Station	March - 1949							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1360	1140	1380	1310	1220	f780	1160	
Point Pinole			1050	700		380		
Point Davis	980	440		390	301	230	240	420
Grand View	870	660	710	340	440	360	380	410
Crockett		a230	730	270	a68	151		410
Benicia	500	200	260	96	40	22	112	a140
Martinez	a560	110	400	18	a5	26	15	a43
West Suisun	190	50	160	21	10	11	7	12
Innisfail Ferry	170	130	83	110	b63	60	41	a38
Port Chicago	350	10	230	3	3	4	c4	4
Nichols	180	10	15	3				
O & A Ferry	30	10	7	2	a3	3	4	a4
Pittsburg	10	5	6	2	5	5	7	
	Sacramento River Delta							
Collinsville	2	3	2	1	14	1		1
Three Mile Slough								
Rio Vista Bridge	2	1	1	10	1	4	2	2
Isleton	2	1	1	1	1	1	2	1
	Mokelumne River Delta							
Terminous	a4	a9	a7	8	a6	ab5	a6	a3
Southwest Point								
	San Joaquin River Delta							
Winter Island	7	5	4	4	3	3	4	4
Antioch	8	10	3	16	8	10	4	a4
Millers Harbor	6	5		5		5	4	4
Webb Pump	7	7	6	a6	5		7	a6
Opposite Central Landing	1	1	1	1	5	2	2	a1
Dutch Slough	8	10	9	10	11	10	9	8
Orwood Bridge	12	13	13	9	6	5		4
East Contra Costa I. D.	20	16	17	a17	b17	13	10	9
Victoria	13	14	10	8	4	5	a5	4
Clifton Court Ferry			9	3	4	3	3	4
Stockton Country Club	13	8	4		3		4	3
Garwood Bridge	13	6	b5	a3	3	3	3	a4
Williams Bridge	7	10	6	b3	6	5	b3	
South Fabian	14	11	6	ab4		4		b5
Grant Line Bridge	12	3	6	a3	3	3	3	4
Mossdale		4	4	a2	4	6	a3	3
At Vernalis	e13		e4	c3			e3	
	April - 1949							
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1130	1340	e1380	1490	1340	e1000		1300
Point Pinole						a910		
Point Davis		590	780			680		570
Grand View	560	570	690	780	780	e880	740	740
Crockett	620	590		a820	a430			610
Benicia	450	470	470	540	260	360	400	420
Martinez	282	310	240	250	140	62	130	160
West Suisun	b40	290	b180	100	70	10	27	62
Innisfail Ferry	ab41	35	ab40	ab32	27	a39		a30
Port Chicago	85	f95	c190	100	39	42	81	104
Nichols	27		50	100				14
O & A Ferry	a3	3	a5	a1	2	a2	a1	a2
Pittsburg	a5	5	3	6	4	a2	a2	a3
	Sacramento River Delta							
Collinsville	3	3			10	a4	a1	
Three Mile Slough				1	f1	2	1	1
Rio Vista Bridge	2	2	2	1	1	1	2	1
Isleton	1	1	1	1	a1	1	1	1
	Mokelumne River Delta							
Terminous	a5	a1	2	a3	3	3	a2	2
Southwest Point				bkn	2	a1		1
	San Joaquin River Delta							
Winter Island	3	3	a3	2	3	a4	a2	2
Antioch	3	3	a3	2	3	a2	3	3
Millers Harbor	4	4	4	2	2		2	2
Webb Pump	4		a4	5	e4		a3	3
Opposite Central Landing	2	5	a3	3	2	a2	a1	4
Dutch Slough	6	5	5	6	4	a6	a4	4
Orwood Bridge	4	4	5	4	5	6	6	
East Contra Costa I. D.	a8	b8	ab10	9	8	a7	8	8
Victoria	4	ab5	5	6	6	8	7	
Clifton Court Ferry	4	4	7	7	9	a8	a6	9
Stockton Country Club	3	4	a5	5		a8		8
Garwood Bridge	2	5	a6	7	6	a5	6	a6
Williams Bridge		b6		b9		9	e13	
South Fabian			6		8	a8	8	9
Grant Line Bridge	3	a6	7	8		5	9	2
Mossdale	b6	5	9	5	7	8	9	2
At Vernalis		7	b9		5		e10	

(a) Taken at Low High Tide
(b) Taken on following day.
(c) Taken two days later
(e) Taken on preceding
(f) Taken two days earlier.

TABLE 185 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Station	May - 1949							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1250	1460	e1540	1530	1340	e1230	1390	1380
Point Pinole							a1180	
Point Davis		790		960	620	e710	1080	850
Grand View	820	940	b890	900	866	e910	e830	860
Crockett		610	880	890	a400		a780	820
Benicia	410	470	560	700	230	e580	720	490
Martinez	270	a310		a210	120	e220	460	370
West Suisun	72	80	90	240	100	120	350	170
Innisfail Ferry	a29	a29	a30	ab28	27	bkn	a20	a40
Port Chicago	b44	ab390	a140	230	160	b230	360	b210
Nichols								
O & A Ferry	2	a4	a8	a8	2	a2	a5	8
Pittsburg	a2	a13	a3	a5	4	a2	a2	a3
Sacramento River Delta								
Collinsville		a1	a3	1	1	a1	a2	2
Three Mile Slough	1	b1	1	1	1	1	1	1
Rio Vista Bridge	1	b1	2	1	1	1	3	1
Isleton	1	b1	a1	1	1	3	1	2
Mokelumne River Delta								
Terminous	a2	3	4	a3	a3	2	3	a1
Southwest Point	1			1	1			1
San Joaquin River Delta								
Winter Island	1	a1	a2	5	2	a3		
Antioch	1	a2	a2	3	3	a3	a2	3
Millers Harbor	2	a2	2	2	3	3	3	4
Webb Pump	b2	a3	ab2	2	3		a3	4
Opposite Central Landing	2	a2	a1	3	2	a2	a2	3
Dutch Slough	3	a4	a4	3	5	a4	a4	3
Orwood Bridge	6	b7	6	a4	5	3	3	4
East Contra Costa I. D.	7	a7	4	4	b4	a4	4	2
Victoria	7	b4	4	a4	ab3	3	3	5
Clifton Court Ferry	6	a3	3	a5	3		5	6
Stockton Country Club		ed3	a4	5		a3	3	
Garwood Bridge	2	a1	a4	a4	2	a3	ab5	5
Williams Bridge	4	b2	ab7		ab4	a3	b4	5
South Fabian	6	b7	5	b5	10	3	5	
Grant Line Bridge	3		4	4	4	3	5	4
Mossdale	2	a2	4	4	4	2	6	3
At Vernalis	c3				e2		9	
	June - 1949							
San Francisco, San Pablo and Suisun Bays								
Point Orient	1340	e1460	1610	1500	1510		1580	1620
Point Pinole		a1300				a1200		
Point Davis			1150	1220	1040	1160	1320	
Grand View	950	bkn	980	960	970	1030	1060	1080
Crockett	610	e1030	1090	1060	930	ae860		e1110
Benicia	260	e760	750	840	700	e910	1000	980
Martinez	250	e510	720	720	490	e800	950	790
West Suisun	130	a380	490	540	340	530	790	590
Innisfail Ferry	30	30	a50	80	a80	a70	a150	190
Port Chicago	110	a270	b540	370	b940	b590	890	e760
Nichols				370	310	560	160	e200
O & A Ferry	6	a22	a30	a80	a40	a60	a170	200
Pittsburg	5	a12	a18	a30	a30	a24	a41	a50
Sacramento River Delta								
Collinsville	2		a3	19	a7	a9	ae35	92
Three Mile Slough	2	3	2	3	b2		4	4
Rio Vista Bridge	3	2	2	1	b3	2	2	2
Isleton	1	3	3	3	3	a2	2	2
Mokelumne River Delta								
Terminous	a3	2	a4	a3		3	a1	4
Southwest Point		a2		b1				1
San Joaquin River Delta								
Winter Island	4	a7	a9	32	a15		a37	92
Antioch	3	a4	a5	11	a8	a7	53	42
Millers Harbor	3	3	5	9	c8	9	27	24
Webb Pump	4				a3	a4	4	
Opposite Central Landing	4	a2	a1	2	a2	a2	a3	2
Dutch Slough	3	a3	a3	3	a4	a4	4	6
Orwood Bridge	6	a5	5	5	6		6	4
East Contra Costa I. D.	b7	5	5	5	a6	a6	5	4
Victoria	5	5	3	6	b6	7	5	
Clifton Court Ferry	5	a4			a6	5	6	7
Stockton Country Club	5		6	5			4	6
Garwood Bridge	2	a5	a5	4	a5	a7	7	7
Williams Bridge	c5					a7		
South Fabian		a5				7	11	12
Grant Line Bridge		5	5	6	a6	8	9	11
Mossdale	3	a6	5	4	a8	10	12	14
At Vernalis	4		e4	b5		10		

(a) Taken at Low High Tide.
(b) Taken on following day.
(c) Taken two days later.
(d) Taken over 1 hour off scheduled time.
(e) Taken on preceding day.

TABLE 185 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Station	July - 1949							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient		e1560	1680	1600	1700	e1670	1700	1690
Point Pinole		a1410				a1490	a1520	
Point Davis	1300	e1320	1390	1300	1330	e1460	1450	1410
Grand View	1110	e1120	e1170	1190	1210	e1220	1250	1280
Crockett	1260		1380	1230		e1450		
Benicia	970	900	1100	1040	1120	1120	1150	1150
Martinez	740	e940	930	710	940	e1130	a880	910
West Suisun	530	b700	920	750	820	940	940	700
Innisfail Ferry	a180	a160	a240	330	350	ab340	420	460
Port Chicago	a530	f890	a790	b600	f710	b1060	b1050	b930
Nichols								
O & A Ferry	a130	a190	a270	260	a260	a340	a400	390
Pittsburg	a90	a70	a130	a120	a120	a180	a200	a280
	Sacramento River Delta							
Collinsville	a63	a66	220	176	a178	a189	a237	234
Three Mile Slough			7	8		8	15	13
Rio Vista Bridge	3	3	2	3	3	4	3	5
Isleton	2	3	3	3	a3	3	3	3
	Mokelumne River Delta							
Terminous	3	3	a7	a6	5	6	a4	4
Southwest Point				1			1	a1
	San Joaquin River Delta							
Winter Island	63	a64		182	133	157	163	228
Antioch	a36	a25	a42	109	a60	a74	a113	a143
Millers Harbor	29	45	61	59	77	57	139	111
Jersey Island		a6						
Webb Pump								
Opposite Central Landing		a3	a3	5		a4	a4	a5
Dutch Slough	a4	af5	6	11	a12	a11	16	a22
Orwood Bridge	b5	5	5	5	a5	5	6	5
East Contra Costa I. D.	a7	6	6	b7	a7	b7	7	ab6
Victoria	b7	6	7	6	a6	7	6	b7
Clifton Court Ferry		a9	10	8	a11	a8	7	a9
Stockton Country Club			8		a9			a11
Garwood Bridge	b10	a10	9	9	a11	a12	10	a12
Williams Bridge		a6	b6			a6		
South Fabian		b13		13		13		a14
Grant Line Bridge		14	14	16	a16	16	a15	13
Mossdale	a15	14	14	16	a17	16	17	a15
At Vernalis		14		f15		16		
	August - 1949							
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1720	e1740	1750	1720	1680		1770	1740
Point Pinole	a1570							
Point Davis		e1450	1450	1480	*1490	1500		1450
Grand View	1320	1340	1340	1370	1370	1430	1440	1460
Crockett	1400	e1450	1430	b1340	1220	a1340	1450	1410
Benicia		1240	1210	1040	1190	1220	1130	1210
Martinez	1090	1110	1120	a900		a1120	890	970
West Suisun	1000	980	810	740	890	900	720	860
Innisfail Ferry	a420	a490	a530	510	520	a520	a510	a500
Port Chicago	960	b1020	880		ac690		ab930	e960
O & A Ferry	a340	a390	a390	a360	a330	a380	a360	330
Pittsburg	a190	a230	a200	130	a170	a170	a180	*a210
	Sacramento River Delta							
Collinsville	a193	a192	a103	199	a150	ab200	220	a180
Three Mile Slough	14	17	20	11	10	11		11
Rio Vista Bridge	b5	3	4	4	b4	a4	4	4
Isleton	a3		5	4	b5	3	3	4
	Mokelumne River Delta							
Terminous	4	a8	5	a8	a4	6	4	4
Southwest Point			1				1	
	San Joaquin River Delta							
Winter Island	182	188	178	193	a160	a170	a170	160
Antioch	a84	a116	192	a114	a85	ae88	170	a90
Millers Harbor	b132	160	137	108	ab76	129	105	122
Opposite Central Landing	a4	a6	8	a7	a6	a6	7	a6
Dutch Slough	a34	a19	24	21	16	a18	19	18
Orwood Bridge	5		7	8	b7	8	8	b8
East Contra Costa I. D.	a6	7	8	9	a8	9	8	a10
Victoria	b5	7	8	7		8	9	b10
Clifton Court Ferry	ae10	8	7	9	a10	a12	a13	a16
Stockton Country Club	a9	13	10	a12	a11	bd11	12	
Garwood Bridge	b11	11	11	b15	b12	13	a8	a13
Williams Bridge			9	ab8		8	9	
South Fabian			17	a18		b19		
Grant Line Bridge	a14	11	a17	19	a15	16	a15	a15
Mossdale	a16	18	18	a17	a16	16	17	a14
At Vernalis	e14		15	c14	c17		15	ab17

(*) Presumed.
(a) Taken at Low High Tide.
(b) Taken on following day.
(c) Taken two days later.
(d) Taken over 1 hour off scheduled time.
(e) Taken on preceding day.
(f) Taken two days earlier.

TABLE 185 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Station	September - 1949							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1720	1690	1720		1590	1680	1700	1580
Point Pinole				a1480		1440		
Point Davis	1510	1440	1270	1390	1410	1360	1410	1390
Grand View	1450	1420	1420	1440	1450	1450		1440
Crockett	1460		1340	a1120	1170	1250	1380	1180
Benicia	1230	1120	1040	1030	b1100	910	860	970
Martinez	1080	a810	1160	910	bkn	740		900
West Suisun	910	750	680	780	b700	500	630	670
Innisfail Ferry	a500	ae490	510	480	a480	b410	410	a440
Port Chicago	850	900	c810	e790	e780	740	850	e820
O & A Ferry	a400	a320	290	a220	a220	230	a200	a200
Pittsburg		a150	137	a120	a60	80	a110	a70
Sacramento River Delta								
Collinsville		a178	141	b125		84		a88
Three Mile Slough			1	6	b5	7	7	
Rio Vista Bridge	b4	4	15		b2	3	2	b2
Isleton	b2	3	a4	3	a2	3	3	a2
Mokelumne River Delta								
Terminous	6	a4	4	4	5	4	5	3
Southwest Point								
San Joaquin River Delta								
Winter Island	b168	a132	b138	100	70	96	80	a69
Antioch	a80	a100	a84	a45	49	42	a38	a32
Millers Harbor	b160	a73	70	56	b48	40	57	b43
Jersey Island						17	22	a15
Webb Pump		b14	12	11		10	11	a9
Opposite Central Landing	8		a5	a4	a4	5	a4	a4
Dutch Slough	a17	a17	a16	a14	a14	15	14	a12
Orwood Bridge	b8	9	8	10	a11	11	10	a12
East Contra Costa I. D.	a9	10	12	11	a14	b14	a16	a18
Victoria	b10	13	11	14	a14	14	13	b16
Clifton Court Ferry	a14	14	a16	a17	a17	a18	17	a17
Stockton Country Club	a13		a13	a13		b15	14	a15
Garwood Bridge	a15	15	15	a15	b15	15	a16	a16
Williams Bridge		a11	a10			11		
South Fabian	c21			a20	b19		a18	
Grant Line Bridge	b14	a16		a16	15	a15	14	a15
Mossdale	17	14	a17	a15	b14	a13	a15	a14
At Vernalis			17	14		14		14
	October - 1949							
San Francisco, San Pablo and Suisun Bays								
Point Orient	e1640		1570		1630	1720	1680	1560
Point Pinole				a1330				
Point Davis	e1250	1290	1170	1320	1260	f1330	b1330	1270
Grand View		1420	1440	1450	1440	f1440	1410	1420
Crockett		1250	1130		a1250	1340	1230	
Benicia		930	860	1120	890	1030	1140	900
Martinez	a690	760	a730	900	720		950	
West Suisun	a570	580	630	660	b560	b620	780	630
Innisfail Ferry	ab410	b410	410	390	b420	410	420	420
Port Chicago	680	b720	b630	740	570	600	850	670
O & A Ferry	a240	250	230	a230	210	250	a240	230
Pittsburg	a100	90	90	a80	90	a80	a80	90
Sacramento River Delta								
Collinsville		119	86	175				97
Three Mile Slough	5	5	5	a5				5
Rio Vista Bridge	3	3	3	2	1		1	2
Isleton		2	2	a2		a1	1	2
Mokelumne River Delta								
Terminous	4	4	b6	5	a6	5	5	a4
Southwest Point								
San Joaquin River Delta								
Winter Island	a76	73	88	81		63		61
Antioch	a39	42	a35	a41	34	64	a33	41
Millers Harbor	47	40	37	51	26	47	53	25
Jersey Island		14	13	25		14	20	8
Webb Pump		9	9			8	8	6
Opposite Central Landing	a6	4	a3	a4	3	3	a3	4
Dutch Slough	a12	12	a12	a10	10	a9	a9	10
Orwood Bridge	10	13	13	12	15	15	15	ab3
East Contra Costa I. D.	a17	19	a19	18	20	21	a16	16
Victoria			a18	18	16	17	14	10
Clifton Court Ferry	a17	a17	a16	a16	15		10	12
Stockton Country Club	a15	a16	a15	a17	f16	a17		
Garwood Bridge	a16	17	18	a17	13	a10	a9	12
Williams Bridge		a10	a18					19
South Fabian		a18				a10		12
Grant Line Bridge		15	16		10	a8	10	10
Mossdale	15	a16	a14	a13	ab10	a8	a10	10
At Vernalis		c15		e15				

(*) Presumed.
(a) Taken at Low High Tide.
(b) Taken on following day.
(c) Taken two days later.
(e) Taken on preceding day.
(f) Taken two days earlier.

TABLE 185 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Station	November - 1949							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1690	1610	1640	1360	1660	1660	1590	1590
Point Pinole			1490			1420		1340
Point Davis		1350	1310	1220	1330	1290	1170	1220
Grand View	1430	1440	1350	1350		b1290		1290
Crockett	1250	1330	1300			a1040	1160	
Benicia	1150	1120	1130	860	1060	1040	830	920
Martinez	850	950	1120	870	790	870	870	830
West Suisun	640	710	750	b600	550	580	640	520
Innisfail Ferry	500		a430	430	ab400	390	390	
Port Chicago		b830	a998		870	700	640	740
O & A Ferry	280	320	a320	190	230	260	150	190
Pittsburg	100	140	a170	50	70	130	50	60
	Sacramento River Delta							
Collinsville	129	213	189	60	109	153	48	51
Three Mile Slough	5	3	e6	3	3	5		4
Rio Vista Bridge	1	1	1	2	1	1	1	2
Isleton	2	2		2		1	a2	1
	Mokelumne River Delta							
Terminous	a4	6	6	a8	a4	7	a3	a4
Southwest Point								
	San Joaquin River Delta							
Winter Island	70	95	140	55	51	62	62	32
Antioch	65	a59	129	27	64	a23	29	28
Millers Harbor	37	68	74	21	24	40	17	15
Jersey Island	a13		a17	7	f9		7	
Webb Pump		7	8	8	7	7	8	
Opposite Central Landing	3	4	a4		3	a2	2	4
Dutch Slough	a8	a8	9	a9	10	a9	9	10
Orwood Bridge	12	11	12	12	11	12	12	12
East Contra Costa I. D.	b16	17	a15	14	15	a14	13	12
Victoria	11	12	11	11	9	12	12	11
Clifton Court Ferry	10		10	9	10	11	11	10
Stockton Country Club	12	a12		ac10	ab11	b10	11	
Garwood Bridge	12	a12	ab10		e8	a11	b11	11
Williams Bridge		14				10	11	15
South Fabian						a12		
Grant Line Bridge	a10	10	a10	9		a10	8	9
Mossdale	a11	a8	ab8	10	a9	a10	10	a10
At Vernalis	b8				10		10	

Station	December - 1949							
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1550	1640	1600	1650	1740	1640	1590	1510
Point Pinole		1420		1360				1340
Point Davis	1130	1290	1260	1340	1140	1230	1240	ae1290
Grand View	1290		1220	1210	1150	1160	1170	1170
Crockett	1200		1180			1110		1260
Benicia		1040	1000	1010	1200	860	850	1170
Martinez	900	900	1050	750	1040	890	890	1090
West Suisun	650	640	670	690	810	590	a480	750
Innisfail Ferry		390	a400	390	410	a410	a410	a390
Port Chicago	a760	560	690	e740		a780	b770	820
O & A Ferry	200	280	a270	190	360	260	180	310
Pittsburg	80	110	a90	80	330	a90	90	190
	Sacramento River Delta							
Collinsville		112	116	48	250	146	45	148
Three Mile Slough	4	3	4		a7	4		2
Rio Vista Bridge	1	2	1	1	1	2	2	3
Isleton	3	1	2	1	2	1	2	2
	Mokelumne River Delta							
Terminous	a5	a5	6	a5	a3	5	a3	a6
Southwest Point								
	San Joaquin River Delta							
Winter Island	35	61	46	46	47	146	147	
Antioch	33	a19	a36	26	154	a32	37	85
Millers Harbor	22	43	35	23	75	42	21	47
Webb Pump	8	8	8	8	8	7	b8	b7
Opposite Central Landing	4	a3	a3	a4	6	a2		5
Dutch Slough	11	8	a9	9	9	a9	8	9
Orwood Bridge	11	11	11	11	12	11	ab12	12
East Contra Costa I. D.	13	a14	ab14	14	a13	a14	14	15
Victoria	11	a11	9	10	11	a11	12	13
Clifton Court Ferry			10		9	11	9	11
Stockton Country Club	11	11	a14	ab12	a10			11
Garwood Bridge	b11	a9	a11		b11	a10	9	
Williams Bridge		13	b13		13	13	13	b14
South Fabian					a12	a11		
Grant Line Bridge		a8	a10	12	a9	a10	a11	a14
Mossdale	a11	a8	a10	ab9	9	a11	11	a11
At Vernalis		c10		9	c12		b12	

(a) Taken at Low High Tide.
(b) Taken on following day.
(c) Taken two days later.
(e) Taken on preceding day.
(f) Taken two days earlier.

TABLE 186

DAILY SALINITY OBSERVATIONS TAKEN AT WEST SUISUN STATION
NORTH SHORE, WEST END OF SUISUN BAY - 1949

Samples taken by U. S. Maritime Commission, Reserve Fleet Mooring Area, approximately one and one-half hours after high high tide.

Date	Salinity expressed in parts of chlorine per 100,000 parts of water											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	370	420	170	41	a107	140	410	820	920	680	580	620
2	460	240	190		72	130	530	1000	910	a570	640	650
3	400	480	200	40	67	120	480	920	a640	740	620	620
4	320	430	170	94	169	190	530		890	640	650	610
5	460	300	80	163	98	380	610		830	580	690	
6	430	470	50	290	80	a380		980	750	580	710	640
7	450	630	40	320	a299	470	700	940	730	600	750	740
8	430	480	50	180	190	370	770	820	590	620	790	640
9	1070	430	80	190	130	420	830	860	610	550	890	730
10	850	570	160		90	490	920	810	680	630	750	670
11	770	820	240	180	150	540	780	800		570	610	550
12	790	450	88	330	220	640	860	880	640	600	550	
13	860	440	42	60	220	510	790	700	790	620	510	650
14	830	350	21	100	240	540	750	740	780	660		690
15	760	310	28	110	160	460	590	1070	770	900	600	680
16	bkn	340	11	60	80	270	610	840	770	780	580	700
17	460	*300	13	70	140	290	670	860	610	710	680	690
18	410	520	10	70	100	340	820	890			550	810
19	440	330	8	51	20	310	780	960	700	560		
20	590	440	8	11	30		840		660	540	640	680
21	400	520	8		a130	510		950	670	a510	670	620
22	530	500	11	10	120	530	940	900	500		580	590
23	660	500	9	43	160	600	950	850	630	620		550
24	590	590	7	30	180	650	980	670	630	670	580	830
25	540	320	8	240	200	820	850	740	630	730	530	420
26	540	370	7	27	350	790	940	720	630	780	640	a480
27	530	410	16	38	280	650	920	650	650	630	410	550
28	510	310		28	320	630	870	740	680	590		620
29	460	—	10	70	280	610	790	820	720	500	770	660
30	490	—	12	62	170	590	700	860	670	630	520	750
31	360	—	14	—	200	—	720	930	—		—	620

TABLE 187

DAILY SALINITY OBSERVATIONS TAKEN AT PORT CHICAGO STATION
U. S. NAVAL AMMUNITION LOADING WHARF - 1949

Samples taken by U. S. Marine Corps approximately one and one-half hours after high high tide

Date	Salinity expressed in parts of chlorine per 100,000 parts of water											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	680	470	310	a6		100				850		
2	220		350	85		110	a530	960	850	680		a760
3	240	320	260	86	44	90				780		
4		480		95	a9	400	890			710		
5	a150	200			22	570				790		880
6	460	a480	10			a270			900			560
7	450	540			a390	a260		1020		720	830	920
8	640	550			275	390	880	970		510	a890	900
9	160	350				330				760	1090	880
10	430	460	230		a140		790	880			a990	690
11	360		63		400	540	790			630		620
12	720	470	64	190	414		800		810	820		620
13	780		24				820		790	850		740
14	720	260	3	100	230	370				740		
15		340	6	220	a60		600					
16	530	a190	6	78	160	470	710		760			
17	610	450	3	a10					780	750	a700	
18	a580	440	3	39	160					570	870	
19		410	4	10	60	940				bkn	850	
20	620	400	4	2	130	530		a690	800	740	790	850
21			3	a1		a360				580		760
22	720	570	4	42					740	600	700	a780
23	660	380	3	87	230	590	1060		750	600	730	
24	510			a20						590	540	770
25	530	460		81		700	900	880		910	570	610
26	530	370		81	360	890			850	850	640	
27		340		81	390	910	1050	a930		700	a650	770
28			4	91			1010	a930	840			960
29		—	4		230	760	810	980	820	640		820
30		—	4	104			*910			670	740	820
31	420	—	5	—	210	—	930		—		—	880

TABLE 188

DAILY SALINITY OBSERVATIONS TAKEN AT ANTIOCH STATION
ANTIOCH WATER WORKS WHARF - 1949

Samples taken by Municipal Water Company approximately one and one-half hours after high high tide

Date	Salinity expressed in parts of chlorine per 100,000 parts of water											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		11	7	4	2	3	30	a90	a80	a31	56	30
2	9	9	6	4	2	3	a30	a78	a80	a37	60	38
3	7	11	7	4	2	a3	a30	a82	a110	a46	62	40
4	5	10	6	4	2	a3	a21	a90	a88	48	76	41
5	6	9	6	4	2	aa3	a26	a132	a90	46	84	a30
6	6	9	6	3	2	a3	a26	a110	a99	38	a62	a20
7	6	9	6	3	2	a4	a41	a114	a95	46	a65	a28
8	6	8	5	3	2	a4	a40	a125	105	a33	121	a42
9	8	8	4	2	a2	d5	a36	a110	a92	a30	166	aa49
10	7	8	4	4	a2	a5	a42	175	a81	a33	135	a34
11	8	13	3	3	a2	a5	a58	150	a76	a32	75	a24
12	15	10	4	3	aa2	11	135	145	a65	a27	a40	28
13	41	8	5	a3	2	8	108	a118	a59	a29	a38	28
14	30	8	5	3	3	10	95	a98	a48	a34	24	30
15	24	8	5	3	3	10	a81	a86	a46	a34	32	41
16	13	8	5	3	3	a10	a82	a68	a45	a44	31	98
17	14	8	6	3	2	a9	a58	a68	a42	aa50	38	110
18	12	8	6	3	2	a8	a60	a80	a50	36	36	162
19	10	8	6	3	a2	a7	a58	a75	a41	42	61	125
20	12		5	3	a2	a6	a56	a95	a49	48	50	88
21	14	9	5	aa3	a3	a6	a65	a120	a50	60	68	a29
22	14	10	5	a3	a3	a7	a70	a96	51	58	a22	a35
23	14		5	a2	a3	a8	a80	a110	65	a38	a26	a34
24	13	11	5	a2	a2	a13	a88	a106	a51	a38	a25	a45
25	10	10	5	a3	a3	a14	a87	150	a50	a38	a26	a43
26	11	9	5	a3	a3	54	a108	128	a52	a33	25	38
27	12	8	4	a2	a3	44	185	a122	a43	a39	30	32
28	11	7	4	2	2	45	187	a100	a34	a30	24	38
29	10	—	5	a2	a2	38	148	a75	a34	40	26	76
30	10	—	5	2	2	40	a148	a75	a34	44	30	78
31	10	—	4	—	3	—	a72	a76	—	54	—	105

(a) Taken at Low High Tide.
(aa) Taken at High Low Tide.
(d) Taken over 1 hour off scheduled time.
(*) Presumed.

TABLE 189

COMPARATIVE ANNUAL MINIMUM 10-DAY FLOW TO DELTAS OF SACRAMENTO AND SAN JOAQUIN RIVERS AND AREA OF EACH AFFECTED BY SALINITY ENCROACHMENT GREATER THAN 100 PARTS OF CHLORINE PER 100,000 PARTS OF WATER

Year	Flow for Minimum 10-day period (1)					Runoff in % of Normal*			Area Affected by Salinity					
	Sacramento River at Sacramento		San Joaquin River at Vernalis		Sacramento and San Joaquin to Delta	Sacramento and San Joaquin to Delta	At Sacramento	At Vernalis	All Deltas		Sacramento and Mokelumne		San Joaquin	
	Date	c.f.s.	Date	c.f.s.	c.f.s.				% of Total	Acres (2)	% of Total	Acres (3)	% of Total	Acres
1920		(4)540		(4)450		52	48	66	15.1	65800	7.7	33500	7.4	32300
1921						118	126	95	2.1	9150	2.0	8715	0.1	435
1922						103	95	123	2.9	12600	2.4	10420	0.5	2180
1923						76	70	88	2.1	9150	2.0	8715	0.1	435
1924	7/14	858	7/26	407	1280	28	30	24	50.0	217500	18.4	80100	31.6	137400
1925	8/7	2860	8/29	743	3730	86	84	88	3.6	15630	3.1	13450	0.5	2180
1926	7/28	1460	8/21	586	2080	60	63	56	18.5	80500	8.5	37000	10.0	43500
1927	8/23	3560	8/23	1300	4850	121	127	104	2.9	12600	2.4	10420	0.5	2180
1928	8/15	2660	8/22	866	3550	84	89	70	5.7	24800	3.7	16100	2.0	8700
1929	7/18	2460	8/12	590	3090	44	44	46	7.1	30900	4.2	18300	2.9	12600
1930	8/5	2500	8/9	735	3230	65	71	53	5.4	23500	3.8	16500	1.6	7000
1931	7/20	-79	7/21	211	131	30	32	27	73.8	321000	30.2	131000	43.6	190000
1932	8/11	1980	9/10	1030	3030	78	69	106	5.7	24800	3.4	14800	2.3	10000
1933	8/21	1450	8/14	607	2070	48	46	54	9.8	42600	5.2	22600	4.6	20000
1934	7/20	1150	8/14	346	1530	43	45	37	37.5	163000	17.8	77500	19.7	85500
1935	8/12	2920	8/12	922	3940	91	87	103	2.9	12600	2.4	10420	0.5	2180
1936	8/20	2540	8/17	1040	3600	96	92	104	2.6	11600	2.2	9840	0.4	1760
1937	8/16	1720	8/24	1020	2820	80	70	105	3.5	15200	2.6	11280	0.9	3920
1938	8/12	5190	8/27	2130	7365	170	167	180	0	0	0	0	0	0
1939	8/5	630	7/25	610	1315	43	43	46	29.0	126000	17.0	74000	12.0	52000
1940	8/12	2550	8/9	1080	3620	115	118	105	4.2	18300	3.0	13000	1.2	5300
1941	8/24	4190	9/14	1480	5800	137	143	127	1.2	5100	1.2	5100	0	0
1942	8/22	3740	8/20	1520	5300	129	133	118	1.2	5100	1.2	5100	0	0
1943	8/17	2600	8/4	1480	4140	114	111	117	2.8	12200	2.2	9600	0.6	2600
1944	8/13	2790	8/9	1033	3830	56	54	62	7.2	31300	4.8	20800	2.4	10500
1945	8/24	6560	8/1	1530	8180	86	79	106	0.2	1000	0.2	1000	0	0
1946	8/7	6460	8/5	1160	7640	92	92	92	0.6	2500	0.6	2500	0	0
1947	7/7	4700	7/21	477	5270	54	54	55	7.5	32400	5.0	21500	2.5	10900
1948	7/24	7550	8/9	(5)606	8260	78	83	68	0.3	1200	0.3	1200	0	0
1949	7/18	6460	8/1	452	6970	63	63	61	2.3	10100	2.0	8500	0.4	1600

* Normal = 50 year mean (1889-1939)
(1) Does not include inflows from Mokelumne and Calaveras rivers, Yolo By-Pass and other minor tributaries.
(2) Delta area taken at 435,000 acres which includes all lands, levees, water surfaces, etc., within Delta boundary.
(3) Sacramento and Mokelumne deltas combined as the Sacramento River contributes a large flow to Mokelumne River Delta through Georgiana and Three Mile sloughs.
(4) No continuous record. Lowest discharge measured.
(5) Figure shown is minimum 10-day flow during summer. Minimum 10-day flow for year occurred March 8 with average flow of 357.

TABLE 190

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS - 1949

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample	Draw Down or G. H.	Depth or c.f.s.	Temperature Degrees	Parts per Million									
					Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
					SACRAMENTO RIVER BELOW SHASTA DAM							T33N,R5W,Sec.15			
1/10	1400	581.58	5126	46											85
2/15	1500	581.00	5904	43	12	6.0	8.9	0.7	0	75	5.8	7.1		0	90
3/14	1500	577.80	2350	42	9.2	5.2	10	0.7	0	77	4.1	2.1		0	99
4/11	0930	578.05	2584	44	11	4.6	8.5	1.9	0	74	3.7	2.8		0	95
5/9	1415	581.5	6462	46	11	5.2	8.4	.9	0	71	4.5	2.8		.4	89
6/13	1500	583.65	9366	44	11	5.4	9.3	.5	0	69	7.4	2.1		0	95
7/11	1430	584.4	10400	47	9.8	4.1	7.3	.7	0	62	8.2	1.4		0	90
8/8	1430	585.7	12328	48	9.6	4.8	6.2	1.7	0	60	8.2	3.5		0	82
9/12	1445	582.35	7486	50	9.2	4.5	5.7	.7	0	60	4.7	2.4		.3	80
10/12	0930	852.9	8440	52	9.5	4.6	6.1	.5	0	61	4.6	2.4		0	80
11/14	0930	500.9	5604	54	10	4.8	7.2	.7	0	67	3.4	3.1		0	93
12/13	1400	578.38	2906	52	11	4.8	9.2	2.1	0	78	3.1	2.8		0	97
					SACRAMENTO RIVER AT SACRAMENTO WEIR							T9N,R4E,Sec.29			
1/10	1115			40	17	11	23	0.9	0	98	27	20		0	170
2/15	1110	2.25		44	13	7.6	13	3.4	0	79	16	13		0	120
3/14	0945	25.20		50	9.6	6.9	9.5	.7	0	56	20	7.8		0	120
4/21	1100			60	9.7	5.7	10	.5	0	57	8.6	7.8		0	88
5/25	0915	11.30		69	14	7.3	17	1.4	0	82	21	13		.5	140
6/15	0820			73	18	11	24	.9	0	100	21	22		0	170
7/22	1445			72			27					21			
8/15	1345			70			25					21			203
9/19	1320	7.44		70			22					18			196
10/17	1235	6.48		61			12					9.7			136
11/17	1320	7.3[E]		54			10					6.2			133
12/14	1040	6.20		48			10					6.9			126
					AMERICAN RIVER AT FAIR OAKS BRIDGE							T9N,R6E,Sec.13			
1/10	1015			39	8.8	2.5	5.1	0	0	37	6.6	4.2		0	55
4/21	0700			52	4.6	1.4	3.7	.7	0	24	3.3	3.5		0	32
7/23	0910			75			12					5.9			
10/17	1130			64			4.2					4.1			69
					SACRAMENTO RIVER AT SACRAMENTO (M STREET BRIDGE)							T9N,R4E,Sec.35			
1/10	1140			40	16	11	24	1.0	0	100	26	20		0	160
2/15	1130	9.40		43	13	8.0	13	1.0	0	81	14	13		0	120
3/16	1545			54	12	6.7	8.9	1.4	0	56	17	9.2		1.1	110
4/20	1615			63	10	5.0	9.9	.3	9.5	45	8.2	6.4		0	85
5/25	0845	7.30		66	8.3	4.5	9.4	1.5	0	48	13	6.6		.4	82
6/15	0800			73	18	8.7	20	.5	0	92	18	20		.7	150
7/22	1510			73			24					20			
8/16	1410			70			26					22			203
9/19	1345	2.7		70			23					20			182
10/17	1555	3.40		62			12					11			126
11/17	1120	2.3[E]		54			10					7.6			119
12/14	1320	3.60		47			10					7.6			119
					SACRAMENTO RIVER AT HEAD OF SNODGRASS SLOUGH							T6N,R4E,Sec.22			
2/14	0920	5.89		43	9.8	5.2	10	.7	0	68	5.3	7.8		.9	100
5/25	1300	5.85		68	11	5.5	11	.5	0	61	14	9.0		0	100
7/22	1005	2.80		72	18	11	24	.5	0	110	19	23		.5	180
8/17	0745	3.73		68	17	11	25	1.0	0	120	20	24		.5	180
11/17	1515	6.50		56	17	7.0	13	1.2	0	83	15	11		0	120
					SACRAMENTO RIVER AT WALNUT GROVE							T5N,R4E,Sec.35			
1/10	1015	14.20		38	12	7.3	14	.9	0	81	12	12		0	110
2/14	1000	1.75		46	11	6.3	10	.3	0	66	12	9.2		.9	110
3/16	1435	6.40		54	9.6	7.1	7.2	2.2	0	52	16	9.9		1.8	110
4/21	1500	3.40		60	7.9	3.1	5.3	1.2	0	41	7.4	4.8		0	63
5/24	1710	5.0[E]		66	12	6.3	14	1.9	0	65	16	15		1.4	110
6/14	1340	4.0		76	13	7.0	16	0	0	69	12	16		0	120
7/22	0940	.40		74	18	11	24	1.0	0	110	19	23		.5	180
8/17	0900	1.08		68	17	11	24	1.4	0	110	21	24		.9	180
9/19	1540	e5.0		72	17	12	25	.9	0	130	16	21		.7	170
10/18	1115	e4.0		62	15	7.1	15	.9	0	91	9.9	12		0	120
11/17	1545	5.3[E]		56	16	7.0	13	.9	0	82	14	10		0	120
12/14	1430	2.45		48	14	7.3	12	.9	0	83	6.8	10		0	120
					CACHE CREEK NEAR CAPAY							T10N,R2W,Sec.14			
1/10	1235			36	36	40	110	2.6	17	260	35	160		1.4	540
3/14	1210			52	23	21	27	1.5	0	160	25	28		0	210
4/21	1210			69	45	36	59	1.5	29	270	31	66		0	390
7/22	1340			80			50					48	2.0		
10/17	1330			64			49					64	2.1		483

e - Estimated

TABLE 190 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS - 1949

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample	Draw Down or G. H.	Depth or c.f.s.	Temperature Degrees	Parts per Million										
					Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
					PUTAH CREEK NEAR WINTERS							T8N,R2W,Sec.28			
1/10	1330	6.20		40	17	35	14	1.2	17	180	19	11		0	210
2/15	1000	7.53		44	15	29	10	.9	0	170	21	9.9		0	180
3/14	1050	10.72		52	14	24	9.0	1.0	0	150	16	9.9		0	160
4/21	1300	5.41		69	24	48	16	.7	0	300	29	12		0	300
5/25	1020	4.48		78	29	54	19	2.6	0	340	29	19		0	340
6/15	0940	3.40		72	37	55	33	1.5	0	370	35	28		0	380
7/22	1205	4.45		75			39					33			
8/16	1530	3.60		77			35					29	1.3		483
9/19	1155	4.73		72			38					30	1.3		469
10/17	1425	4.48		66			38					39	1.5		483
11/17	1215	5.70		53			40					30	1.3		490
12/14	1220	6.54		42			40					36	1.3		525
					YOLO BY-PASS AT LITTLE HOLLAND FERRY							T6N,R3E,Sec.33			
1/11	1000			36	23	37	39	1.4	0	200	57	51		0	320
4/25	1325			68	32	46	41	1.4	0	300	50	46		1.1	390
7/21	1725			74			27					25			
10/18	1030			61			120					140			770
					SACRAMENTO RIVER AT JUNCTION POINT (NEAR RIO VISTA)							T4N,R3E,Sec.17			
1/11	1100			39	15	9.0	16	1.6	0	86	160	15		0	140
4/25	1245			60	8.4	2.6	4.4	.9	0	39	5.8	4.1		0	63
7/21	1650			72			27					21			
10/17	1420			62	- Sample Lost -										
					SACRAMENTO RIVER AT COLLINSVILLE							T3N,R1E,Sec.27			
1/11	1155	6.2		40	24	31	180	4.1	0	88	60	310		0	700
3/16	1330	5.0		54	11	11	12	.9	0	68	25	14		0	150
4/26	1300	4.89		60	7.9	3.9	6.5	1.0	0	44	6.6	7.6		0	73
5/23	1115	4.40E		64	11	5.1	11	1.9	0	59	12	12		.4	100
6/14	1145	3.00		71	17	15	100	.9	0	70	40	160		0	420
7/21	1325			70			780					1400			
8/22	0800			68			580					1000			2730
9/19	1650			65			290					480			1330
10/17	1510			63			410					720			1820
11/22	0835	3.66		57			220					400			1120
12/16	1215	6.60		50			940					1600			3920
					SAN JOAQUIN RIVER BELOW FRIANT DAM							T11S,R21E,Sec.7			
1/14	1425	2.46	150	48	8.8	.9	4.8	.7	0	34	3.3	5.0		0	66
2/18	1605	3.92	758	47	3.6	.5	5.1	0	4.8	19	.4	3.9		0	32
3/18	1530	4.54	1204	52	3.7	.5	5.3	.5	0	12	2.9	6.4		0.5	42
4/15	1630	6.23	2928	42	4.4	.7	5.0	.7	0	24	.4	4.5		0	45
5/20	0930	4.27	998		3.8	.7	4.8	0	0	13	5.3	3.5		0	30
6/18	0930	7.40	4280	53	4.5	1.1	3.1	0	0	16	2.5	3.5		0	32
7/22	0900	6.00	2620	59	2.1	.5	2.5	.7	0	12	2.9	1.0		0	29
8/19	1040	5.19	1790	64	2.3	.6	2.7	.5	0	12	1.1	2.4		0	28
9/26	0955	5.13	1730	71	2.7	.4	3.1	.3	0	14	1.1	2.4		0	29
10/21	1145	4.03	815	65	3.6	.8	4.8	0	0	18	1.1	3.5		0	34
11/17	1110	3.05	301	61	3.8	.6	6.3	.7	0	21	3.7	3.5		0	33
12/19	1100	3.87	712	52	3.8	.7	4.6	1.0	0	22	.8	4.1		0	39
					SAN JOAQUIN RIVER AT MENDOTA POOL							T13S,R15E,Sec.19			
1/17	0935	11.33U 0.56L	16.3	36	5.4	1.8	6.8	1.7	0	34	4.1	5.0		0	53
2/21	0950	11.05U 1.27L	94.1	48	5.2	.9	5.8	.2	0	24	3.3	4.2		0	37
3/21	1030	13.62U 1.89L	225.0	53	3.9	.8	5.1	1.5	0	21	3.7	4.2		.7	38
4/21	1100	14.19U 2.30L	340	59	4.3	.8	5.1	.7	0	23	.4	4.8		0	49
5/23	0955	14.40U 1.65L	159	69	6.2	.7	5.4	.3	0	23	2.9	4.8		0	35
6/20	0800	13.85U 2.74L	426	62	2.9	1.3	2.7	.2	0	15	2.1	3.8		0	34
7/25	0930	13.0 U 2.43L	326	70	2.2	.6	2.7	.3	0	12	3.3	1.0		.5	31
8/23	0850	13.34U 2.20L	274	70	2.7	.7	2.7	.3	0	13	1.1	2.1		0	28
9/26	1135	13.36U 1.84L	194	68	2.8	.6	3.5	.7	0	17	1.2	2.8		0	31
10/24	0915	11.95U 1.42L	121	58	3.7	.7	4.6	.3	0	22	1.0	2.8		0	39
11/21	0930	0.85L	33.5	58	4.9	.6	7.3	.9	0	31	3.7	2.1		0	41
12/20	0950	1.66L	146	44	4.7	1.0	6.2	.5	0	25	1.9	4.1		0	41

TABLE 190 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS - 1949

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample	Draw Down or G. H.	Depth or c.f.s.	Temperature Degrees	Parts per Million									
					Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
					SAN JOAQUIN RIVER AT TEMPLE SLOUGH										T11S,R13E,Sec.12
1/17	1410	1.53	31.7	38											90
2/21	1335	.50	.63	57											48
3/21	1410	.58	1.58	61											52
4/21	1300		342	70											55
5/23	1345	.64	2.61	78	9.6	1.3	11	.3	0	39	7.8	8.3		0	62
6/20	1305	.87	421.7	80											35
7/25	1410		322	81									0.0		35
8/23	1215		265	76	3.7	.9	4.5	.7	0	20	2.1	3.5		0	41
9/26	1545		196.4	74	3.7	.8	4.9	.5	0	21	2.0	3.5		0	39
10/24	1340		111	63			5.2					4.5			
11/21	1240			59			10					8.3			70
12/20	1310		167	45			5.9					5.9			48
					SAN JOAQUIN RIVER AT HEAD OF CHAMBERLAIN SLOUGH										T9S,R13E,Sec.31
2/23	1120	.58		56	18	3.0	13	4.1	0	74	4.5	21		0	120
3/22	1050	.83	19.1	59											60
4/20	1205	.60	8E	66											130
					POSO DRAIN ABOVE BELMONT DRAIN CROSSING										T9S,R12E,Sec.31
1/18	1150		7.52	40	31	18	70	1.4	0	110	75	88		1.2	380
2/21	1455		18.3	54											250
3/22	0945		34.8	56	27	12	52	2.2	0	70	60	75		1.6	300
4/22	1015		58.8	70											240
5/23	1520		62.9	77	34	13	68	1.7	0	110	100	65		0	360
6/20	1510		87.2	76											250
7/26	0710		43.0	72											214
8/23	1430		33.5	76	28	12	64	1.0	0	99	82	68		.7	340
9/27	0940		8.17	66											360
10/24	1505		3.36	63			57					66			364
11/21	1405		4.20	61			100					130			623
12/20	1415		3.58	48			100					140			595
					SALT SLOUGH AT SAN LUIS RANCH										T9S,R11E,Sec.7
1/18	1325	2.38	67.4	43	53	38	210	3.4	0	150	240	270		0	940
2/21	1630	2.19	54.3	58	62	42	230	4.8	17	120	250	320		1.8	1000
3/22	1155	3.12	152.0	57											460
4/21	1400	3.34	167.0	72											320
5/24	1025	3.01	142.0	73	34	17	84	.9	0	99	88	110		0	400
6/25	0700	3.01	138	73	24	12	49	.2	0	83	52	60		0	280
7/26	0830	2.00	40.4	70	29	14	94	1.5	0	99	67	120		0	390
8/23	1545	2.03	39.9	80	33	18	96	.7	0	110	76	140		0	460
9/27	1100	1.87	27.5	67	41	24	130	1.5	0	170	110	160		0	580
10/25	1055	1.67	14.3	58			250					360	0.5		1330
11/22	1020	1.96	31.1	55			200					280			1050
12/21	0950	1.41	46.3	38			140					190			700
					BEAR CREEK NEAR MOUTH										T8S,R11E,Sec.6
1/18	1000	2.33	54.0	39	22	8.6	43	1.7	7.1	160	10	22		.9	230
2/21	1030	2.19	47.3	50											230
3/22	1610	4.49	340	56	14	7.6	16	1.9	0	95	15	7.8		1.8	170
4/21	1545	1.58	25	80											240
5/24	1505	3.43	196	77	14	5.2	27	.2	0	100	16	5.5		0	150
6/25	1300	1.41	10.6	84	26	14	62	1.5	29	140	26	41		0	280
7/26	1305	1.33	10.4	84	25	8.7	75	.3	0	200	26	42		0	290
8/23	0930	1.50	16.9	69	21	10	56	.7	0	200	19	28		0	260
9/27	1610	1.43	13	70	21	11	51	1.4	0	180	16	29	0.1	0	250
10/25	1505	1.16	3.84	62			94					81			
11/22	1425	1.39	13.2	58			50					37			329
12/21	1410	2.17	13.1	47			62					39			350
					SAN JOAQUIN RIVER AT FREMONT FORD										T7S,R9S,Sec.24
1/18	1310	59.08	170	39	46	28	170	4.0	0	150	180	210		0	750
2/23	1425	58.76	113	56	65	39	190	10	0	110	180	320		1.2	990
3/22	1500	60.66	475	59	20	12	41	2.2	0	97	46	47		2.5	260
4/20	1450	59.30	182	68	37	17	86	1.2	0	99	76	130		0	410
5/24	0940	60.24	399	71	22	10	51	1.9	0	100	40	59		1.6	270
6/23	0915	58.97	156	74	35	16	90	1.9	0	110	70	120		0	420
7/29	1620	58.22		82	62	33	200	1.5	0	150	150	320		0	910
8/23	1200	58.25	52	74	52	28	160	1.5	0	150	120	260		1.1	750
9/27	1500	58.36	52	69	47	26	140	2.1	0	180	98	200		.9	640
9/21	1100	58.53	90.2	73			120					160			679
10/26	1115	57.87	19.4		120	70	400	2.6	0	190	290	670		0	1700
11/28	1100	58.10	44.7		76	42	250	3.1	0	190	210	400		0	1100
12/22	1130	58.28	60.1	43	56	34	180	1.7	0	170	160	270		0	850

TABLE 190 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS - 1949

DATA COPIES FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample	Draw down or G. H.	Depth or c.f.s.	Temperature Degrees	Parts per Million										
					Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
SAN JOAQUIN RIVER ABOVE MOUTH OF MERCED RIVER T7S,R9E,Sec.3															
1/19	1150		265	41	45	36	180	.9	0	160	190	220		0	770
2/24	1200		200	57	63	43	220	9.6	0	150	220	310		1.8	1000
3/23	1220		570	57	19	12	51	1.7	0	110	30	57		2.3	290
4/20	1310		200	68	51	26	130	1.4	0	110	130	180		0	600
5/24	1515		372	76	24	11	57	1.0	0	110	48	63		1.6	290
6/23	1315		e194	80	37	24	120	.2	0	110	110	170		0	570
7/27	0940			78	76	49	270	3.8	0	150	250	430		1.9	1300
8/23	1315			77			230					350	0.4		1120
9/21	1240			73			180					240			910
10/28	1100						580					910			2940
11/28	1400						370					560			1820
12/28	1135						300					440			1540
MERCED RIVER AT STEVINSON DRAIN T6S,R9E,Sec.36															
1/18	1530	1.66	145	49	18	6.6	30	1.0	17	110	4.5	16		1.4	170
2/23	1630	1.57	147	60	16	6.8	28	13	9.5	120	9.5	17		1.8	170
3/22	1630	4.62	698	56	12	4.5	10	1.9	0	64	9.5	9.2		1.1	99
4/20	1535	1.68	175	69	15	6.1	21	.7	0	98	8.6	12		0	150
5/24	1110	3.00	398	71	7.7	2.8	8.6	.7	0	48	3.7	4.1		1.2	67
6/23	1000	2.30	234	73	14	3.9	23	.2	0	79	7.8	17		0	130
7/27	1130	1.45	129	75	18	5.8	42	1.5	0	89	12	53		2.1	210
8/23	1535	1.84	200	76			24					15	0.0		140
9/21	1500	1.69	182	75			26					16			175
10/26	1230	1.34	125				32					24			203
11/28	1545	1.40	138				30					16			196
12/28	1110	1.50	140				59					76			343
SAN JOAQUIN RIVER BELOW MOUTH OF MERCED RIVER (AT HILLS FERRY BRIDGE) T7S,R9E,Sec.3															
1/19	1120	2.41		41											500
2/24	1140	2.20	347	57											650
3/23	1200	4.30	1268	56	16	8.7	28	1.9	0	69	35	33		3.2	180
4/20	1235	2.45	379	68											400
5/24	1435	3.38	770	76											190
6/23	1300	2.60	428	76	24	13	67	1.5	0	89	54	84		0	320
7/27	0950	1.90	201	76											514
8/23	1430	2.22	278	75			78					110			441
9/21	1400	2.28	282	73			81					100			448
10/26	1410	1.80	141				120					160	0.2		623
11/28	1445	1.94	189				150					150			770
12/28	1215	2.04	214				134					180			700
VIVIAN SLOUGH AT NORTH LINE OF SECTION 16 (AT OLLINGERS PUMP) T6S,R9E,Sec.16															
2/21	1450			56	34	13	110	15	0	180	20	160		0	450
3/24	1025			56											430
4/25	1445			63											960
5/18	1030			67.5	42	13	170	4.1	0	210	35	240		0	620
6/28	1410			79											460
7/20	1610			79	16	6.4	42	1.0	0	110	7.8	46	0.1	.9	210
8/24	1040			71			77					94			371
9/22	1025			72			92					110	0		441
10/25	1320			56.5			44					57			245
11/29	1145			57			61					87			343
12/28	1320			50			230					360			1050
PATTERSON DRAIN AT SAN RAMON LAKE T5S,R8E,Sec.27															
1/20	0935		e.25	41											2000
2/24	1300			59	180	100	220	.3	0	260	890	150		.7	1800
3/23	1300			59											1900
4/20	1440			66											1600
5/24	1600			73	55	35	130	2.4	0	180	220	130		0	720
6/24	0630			68											940
7/28	1140			74									0.5		909
8/24	1040			63			180					200			1120
9/26	1255			67			140					160			840
10/28	1040						220					200			1400
11/30	1230			56			270					250			1750
12/29	1120						250					170			1610
SAN JOAQUIN RIVER AT PATTERSON WATER COMPANY INTAKE T5S,R8E,Sec.15															
1/20	0920	36.81		41	38	26	130	1.7	0	150	130	150		.7	570
2/24	1245	36.62		59	44	29	140	2.2	9.5	150	140	180		.9	630
3/23	1315	39.30		57	19	8.6	36	2.2	0	86	30	42		1.8	220
4/20	1450	36.46		69	33	17	86	1.7	0	120	72	110		0	390
5/24	1620	38.17		76	18	7.6	41	1.4	0	97	27	42		1.9	220
6/24	0650	36.52		72	29	16	92	1.0	0	120	72	110		0	420
7/28	1120	35.45		77	45	23	140	2.1	0	140	110	190		2.3	630
8/24	1050	35.90		73			120					150	0.2		574
9/26	1245	36.02		69			110					150			595
10/28	1030	35.78					170					250			910
11/30	1245	35.98					160					220			840
12/29	1110	36.08					150					210			840

e - Estimated

TABLE 190 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS - 1949

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample	Draw Down or G. H.	Depth or c.f.s.	Temperature Degrees	Parts per Million									
					Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
					SAN JOAQUIN RIVER NEAR LAIRD SLOUGH BRIDGE							T4S,R7E,Sec.25			
1/20	1040	27.32		42	40	26	130	.9	0	160	130	150		.7	570
2/24	1435	27.00		61	50	33	140	7.6	33	130	150	190		.7	640
3/23	1435	30.02		57											220
4/20	1550	27.13		70	46	25	100	1.7	7.1	130	99	150		.4	490
5/24	1715	28.96		76											250
6/24	0750	27.33		72	40	20	98	1.9	26	110	91	120		0	450
7/28	1045	26.13		75	52	30	140	2.8	0	180	150	190		1.4	710
8/24	1140	27.72		73			120					160			658
9/26	1130	26.74		68			110					140			623
10/27	1645	26.47					170					240			980
11/30	1140	26.65		58			160					220			910
12/29	1250	26.78					150					220			840
					SAN JOAQUIN RIVER AT WEST STANISLAUS I. D. DIVERSION							T4S,R7E,Sec.10			
1/20	1015	24.75		39	36	24	110	1.4	0	160	93	140		.5	500
2/24	1400	24.20		60	51	34	140	.5	9.5	150	150	190		1.4	660
3/23	1410	27.00		60	25	12	51	1.0	0	110	40	57		1.6	260
4/20	1525	24.50		69											530
5/24	1700	26.75		76	21	10	48	1.2	0	110	33	50		2.3	240
6/24	0730	23.44		72	34	20	94	1.5	0	130	88	120		0	460
7/28	1100	22.80		75	53	35	140	2.6	0	180	130	200		2.5	710
8/24	1125	23.35		74			130					170			700
9/26	1145			69			130					170			700
10/27	1700						190					270	0.5		1050
11/30	1155			58			170					250			980
12/29	1235	24.70					150					210			840
					TUOLUMNE RIVER AT TUOLUMNE CITY							T4S,R8E,Sec.7			
1/20	1339	29.24	802	41	18	5.2	31	.3	0	62	2.1	62		.7	180
2/24	1500	28.34		60	28	9.7	49	15	0	100	8.2	97		1.4	290
3/23	1500	31.30	1805	53	12	4.8	15	2.4	0	47	6.2	30		1.2	120
4/21	1245	29.09	736	67	24	7.0	34	.2	12	69	4.1	60		0	200
5/25	1120	27.90	348		38	13	68	2.2	0	130	7.0	130		2.1	400
6/24	0805	27.86		71	32	13	71	.2	26	92	8.6	120		0	350
7/28	1030	27.68		74	43	14	82	1.2	0	150	9.0	150	0.1	3.2	460
8/24	1155	27.91		73			80					140			518
9/22	1225	27.66	293	76			80					150			525
10/27	1635	29.65					26					49			196
11/30	1125	29.62		58			23					44			175
12/29	1300	29.40					29					54			210
					SAN JOAQUIN RIVER AT EL SOLYO PUMPS							T3S,R7E,Sec.29			
1/21	1015	19.87		44	29	14	66	1.7	0	97	51	93		1.6	330
2/25	1225	18.84		60	40	20	87	7.2	9.5	110	60	140		1.4	440
3/24	1215	22.38		57	15	7.2	25	.7	0	68	17	36		1.2	160
4/21	1045	18.84		65	24	11	48	.7	0	92	27	77		0	250
5/25	0950	19.53			33	12	59	1.5	0	120	34	84		1.9	320
6/24	0825	18.20		73	41	20	91	1.9	0	130	52	150		0	500
7/25	1510	17.16		78	53	20	110	2.1	0	150	42	200		2.8	600
8/25	1315	17.68		75			110					170			637
9/22	1155	17.85		75			100					160			609
10/27	1340	19.41					63					98			392
11/28	1515	19.22		60			86					140			511
12/29	1315	19.42					62					110			434
					STANISLAUS RIVER AT BRET HARTE PUMP							T3S,R7E,Sec.9			
1/21	0950	23.85	462	41	11	4.2	4.0	0	0	54	3.3	2.1		0	66
2/25	1300	20.88	147	62	27	11	18	2.4	0	150	9.9	12		1.6	220
3/24	0915	26.08		52	14	6.1	6.6	.5	0	71	7.4	4.9		1.1	96
4/21	0925	21.70		66	18	8.1	12	.2	0	100	8.2	7.6		.2	130
5/25	0900	23.97			11	4.6	5.6	.5	0	60	4.5	1.4		1.6	84
6/24	1145			74	19	6.9	14	.2	0	110	5.8	8.3		0	140
7/25	0940	21.28	201	73	22	9.5	16	1.5	0	130	11	11		2.8	160
8/25	1000	21.25	169	72			15					8.3	0.1		154
9/22	0700	20.58	100	72			16					9.0			182
10/27	1000						15					12			161
11/29	1110	21.22	199	59			12					6.9			140
12/29	1600	21.30					14					8.3			182
					SAN JOAQUIN RIVER NEAR VERNALIS							T3S,R6E,Sec.13			
1/21	1405	7.99	2189	42	24	12	48	1.7	7.1	75	39	68		.5	240
2/25	1240	6.58		60	41	19	81	13	31	93	56	130		1.4	440
3/24	0945	10.70	4636	53	14	6.8	22	.7	0	66	14	30		1.2	150
4/21	1000	6.92		65	29	12	42	.9	0	97	26	70		0	250
5/25	0910	7.98			22	9.9	42	.9	0	94	21	60		1.9	230
6/24	1015	6.58	947	73	37	14	67	1.0	9.5	120	35	110		0	370
7/25	1250	5.55	548	76	41	17	76	1.9	0	150	29	140		2.5	440
8/25	1140	5.88		75			85					130	0.2		532
9/22	0840	5.82	712	73			89					140			504
10/27	1145	7.10					52					93			336
11/29	1400	7.00	1386	60			64					100			399
12/29	1350	7.11	1501				61					100			399

TABLE 190 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS - 1949

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample	Draw Down or G. H.	Depth or c.f.s.	Temperature Degrees	Parts per Million										
					Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
					SAN JOAQUIN RIVER AT BANTA CARBONA I.D. DIVERSION							T2S,R6E,Sec.34			
1/21	1045			43	23	13	54	1.4	0	92	42	74		.5	250
2/25	1410			61	65	32	130	0	26	210	160	150		1.8	700
3/24	1015			54											140
4/21	1020			65	27	11	40	.9	0	83	28	66		0	230
5/25	0930														220
6/24	0850			72	35	15	67	1.5	0	130	36	110		.9	360
7/25	1440	8.60		80	44	19	84	1.7	0	150	39	150		2.1	480
8/25	1200	9.30		75			91					150			581
9/22	1130	9.10		75			93					140			553
10/27	1315	10					62					100		.1	406
11/29	1455	10.10		61			64					97			406
12/29	1335	10.20					100					120			658
					SAN JOAQUIN RIVER AT MOSSDALE BRIDGE							T2S,R6E,Sec.3			
1/11	1430				28	14	63	1.0	0	95	42	100		1.6	310
2/10	1245	.95		44	27	14	56	1.7	0	93	47	79		1.8	280
3/15	1300			55	15	8.6	21	1.0	0	70	18	26		1.2	150
4/22	1345			70	27	12	47	1.4	0	97	24	78		1.6	270
5/26	0950	3.28		72	25	10	43	.7	0	99	23	60		0	250
6/14	0930	5.00		76	16	5.8	25	.2	0	58	16	39		0	150
7/21	0955	.90		74			95					160			
8/19	1150	.40		75			80					140			525
9/19	1550	1.40		74			86					130			525
10/17	0910	1.96		64			50					84			308
11/17	1510			60			60					93			378
12/15	1405	2.05		48			57					100			392
					SAN JOAQUIN RIVER AT BRANDT BRIDGE							T1S,R6E,Sec.9			
3/15	1330	5.7		55	16	7.6	21	.5	0	69	17	26		1.2	150
6/13	1025	7.1		75	14	6.1	24	1.5	0	57	13	37		0	130
7/21	0935	3.92		76			100					160			539
9/19	0930	4.7		74			89					150			574
12/15	1445	6.5		47			58					97			392
					SAN JOAQUIN RIVER AT GARWOOD BRIDGE							T1N,R6E,Sec.16			
1/10	1150				30	15	72	2.4	0	110	53	110		1.2	360
2/10	1205	4.00		44	31	14	69	5.5	0	110	51	100		1.4	340
3/15	1420			56	13	6.2	23	.9	0	71	18	20		1.1	150
4/25	0955			66	22	10	34	1.9	0	99	20	53		1.8	220
5/26	0825	3.50		72	16	7.0	28	2.1	0	80	12	37		1.9	170
6/13	1000	4.60		76	13	6.6	23	0	0	54	12	32		0	130
7/21	0915			76			88					100			
8/19	0910			72			72					120			462
9/19	1420	3.6		74			91					140			525
10/17	1225	3.6		65			77					130			490
11/17	1007	1.60		58			60					87			357
12/15	0955	2.7		47			59					97			364
					CALAVERAS RIVER NEAR STOCKTON							T2N,R6E,Sec.24			
3/17	1230	2.00		57	14	7.3	4.7	.9	0	65	8.2	3.5		1.8	96
					STOCKTON SHIP CHANNEL AT BURNS CUT-OFF							T1N,R5E,Sec.1			
1/10	1120	5.40		43	31	16	69	4.7	0	100	54	110		1.6	350
2/10	1100				31	16	62	2.4	0	110	46	95		1.1	320
3/17	1315	4.20		57	20	8.3	22	.5	0	85	19	26		.9	160
4/25	0915	3.56		64	24	11	41	2.6	0	97	28	65		2.6	250
5/24	0945	3.00		70	12	5.2	20	1.7	0	57	12	28		1.2	130
6/13	0930	5.65		77	17	7.5	33	.9	0	74	16	50		0	220
7/21	0850	2.57		76			56					79			
8/19	0930	2.20		74			58					94			378
9/19	1500	5.1		75			87					140			525
10/17	1250	5.10		66			98					160			610
11/17	0933	2.43		60			60					97			392
12/15	0930	3.5		50			60					120			392
					MIDDLE RIVER AT SANTA FE RAILROAD							T1N,R4E,Sec.15			
3/16	1130			57	34	16	67	1.9	0	97	70	100		1.2	390
6/13	1445			78	18	6.1	30	.2	0	63	21	44		0.0	220
7/21	1245			77			40					46			
9/19	1350			73			57					78			329
12/15	1025			48			70					120			462
					OLD RIVER AT CLIFTON COURT FERRY							T1S,R4E,Sec.21			
1/11	1250	4.28			33	17	77	3.6	0	110	59	120		1.9	390
2/10	1355	4.65		43	35	18	75	2.9	0	88	65	130		.5	390
3/16	1255	4.11		57	15	8.8	22	1.2	0	70	21	28		0	160
4/22	1545			64	23	12	42	1.5	0	86	26	68		1.1	250
5/26	0900	4.33		70	15	6.2	30	.7	0	69	19	35		0	180
6/13	1120			76	15	7.0	30	.7	0	59	16	44		0	160
7/21	1040			76			70					110			
8/19	1240			73			79					140			525
9/19	1015	3.15		72			100					160			602
10/17	1015	1.92		64			86					140			530
11/17	1300	3.29		58			60					100			392
12/15	1140	3.26		47			58					94			385

TABLE 190 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS - 1949

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample	Draw Down or G. H.	Depth or c.f.s.	Temperature Degrees	Parts per Million									
					Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
OLD RIVER AT VICTORIA ISLAND BRIDGE T1N,R4E,Sec.16															
3/16	1215			56	21	10	29	1.2	0	76	33	44		0	210
6/13	1400	3.50		77	19	7.5	32	.9	0	69	19	48		0	170
7/21	1210	3.20		76			50					73			
9/19	1230	2.9		72			100					110			630
12/15	1105	3.7		48			61					110			385
ROCK SLOUGH AT CONTRA COSTA CANAL INTAKE T2N,R3E,Sec.34															
1/10	1400	2.50		38	53	25	93	1.6	0	97	160	140		11	590
2/14	1105	.25		44	47	25	89	1.2	0	57	130	160		3.5	550
3/16	1150	1.00		57	44	24	84	1.9	0	120	99	140		1.8	530
4/25	1055	-0.5		67	24	13	40	1.4	0	85	40	59		1.2	250
5/24	1550	1.40		76	16	7.9	30	2.4	0	63	27	48		.9	200
6/13	1325	.10		78	18	9.3	33	.7	0	69	26	47		0	180
7/21	1125	.10		76	18	9.1	32	.9	0	74	29	45		.9	200
8/19	1350	.80		78	21	12	45	1.2	0	91	34	68		.7	250
9/19	1130	-0.6		72	24	15	62	1.5	0	100	41	93		1.1	310
10/17	1235			63	34	19	78	1.5	0	130	58	120		0	390
11/17	1057	0		58	37	17	81	1.9	0	120	72	120		0	455
12/16	1350	2.70		50	32	18	74	1.9	0	110	59	110		.2	380
MOKELUMNE RIVER AT WOODBRIDGE T4N,R6E,Sec.28															
2/15	1400	5.10		46	6.4	2.1	4.8	.7	0	28	8.2	4.2		0	50
5/25	1415	4.25		72	6.0	1.7	3.7	.2	0	29	2.9	3.5		0	46
7/22	0900			74			3.4					1.4			
8/19	1030			66			1.8					2.1			29
11/17	0945	7.19		56			2.0					3.1			28
COSUMNES RIVER AT McCONNELL STATION T6N,R6E,Sec.20															
2/15	1500	27.58		42	14	6.8	6.9	.5	0	71	14	5.7		.9	110
5/25	1550	33.35		73	4.5	1.4	2.5	.7	0	25	1.6	2.1		0	43
11/17	1020	31.13		50			4.1					2.8			63
MOKELUMNE RIVER AT NEW HOPE BRIDGE T4N,R4E,Sec.15															
2/15	1315	.32		46	12	5.8	6.6	1.0	0	56	16	5.7		.9	110
5/25	1340	.80E		74	5.2	1.6	4.6	0	0	30	2.9	2.1		0	56
7/22	0930	.12		74			8.9					17			
8/17	0920	.02		70			2.5					46			217
11/17	1600	2.90		57			2.6					3.1			36
MOKELUMNE RIVER AT CENTRAL LANDING T5N,R4E,Sec.20															
1/10	1130			38	21	10	29	1.0	0	86	28	41		2.0	190
2/14	1330			45	15	8.6	15	1.6	0	74	18	19		0	130
3/10	1120				15	6.0	12	.2	0	56	17	13		1.1	120
4/26	1100			60	8.0	3.0	4.1	.5	0	36	6.2	4.1		0	71
5/23	1305			65	11	5.7	13	1.4	0	56	13	16		.7	110
6/15	1140			71	13	6.6	17	.2	0	68	16	19		0	120
7/21	1604			72			34					40			224
8/17	1030			70			28					33			224
9/19	1005			70			26					22			203
10/17	1030			62			17					19			154
11/21	1540			57			38					61			287
12/16	1055			50			24					33			217
SAN JOAQUIN RIVER NEAR WEBB POINT (OPPOSITE MOKELUMNE RIVER MOUTH) T3N,R4E,Sec.19															
2/14	1400			44	22	13	26	1.7	0	82	33	40		1.4	190
3/10	1230				15	11	23	.3	0	60	31	39		1.8	200
4/26	1110			64	13	7.0	14	1.0	0	57	14	24		.9	120
5/23	1255			68	14	6.8	20	2.1	0	60	18	31		.9	150
6/15	1150			74	16	6.6	22	.9	0	62	21	27		0	140
7/21	1615			71			40					45			
8/17	1045			72			44					65			294
9/19	1015			70			47					66			308
10/17							44					65			287
11/21	1550			58			39					59			294
12/16	1045			50			36					58			308
SAN JOAQUIN RIVER AT ANTIOCH T2N,R2E,Sec.18															
1/10	1300	2.30		40	18	13	44	1.0	0	71	31	74		1.6	240
2/14	1145	.85		44	26	17	47	1.7	0	86	54	75		2.1	290
3/16	1045	.18		58	22	12	29	1.4	0	73	38	50		.9	240
4/25	1135	1.13		63	11	6.7	26	1.4	0	64	20	26		1.6	110
5/24	1530	1.50		69	12	6.2	17	2.2	0	54	18	26		.5	130
6/13	1150	.85		77	16	12	54	.7	0	65	28	89		0	250
7/21	0730	.84		70			350					630			
8/22	0930			68			430					750			2100
9/20	0820			70			180					300			910
10/17	1315			63			280					490			1190
11/17	1200	2.78		58			130					230			665
12/16	1310	3.20		50			320					590			1610
KAWEAH RIVER AT McKAY POINT EAST QUARTER CORNER T18S,R27E,Sec.4															
1/25	1015		55	40	20	3.3	9.2	1.7	0	76	5.8	13		0	110
6/6	1400		584	64	5.6	.9	2.5	.7	0	22	2.9	2.4		0	37
TULE RIVER AT NORTH QUARTER CORNER (WORTH BRIDGE) T22S,R28E,Sec.3															
1/25	1150		56	42	45	4.4	23	12	0	200	12	18		0	210
6/6	1000		50	69	27	5.2	13	.9	0	120	4.5	6.2		0	140

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

SACRAMENTO–SAN JOAQUIN WATER SUPERVISION

1949

SCALE 1 0 5 10 15 20 25 30 35 40 MILES

LEGEND

- POINTS OF DIVERSION
- SALINITY OBSERVATION STATIONS
- STREAM GAGING STATIONS
- DRAINAGE PUMPING PLANTS
- SACRAMENTO-SAN JOAQUIN DELTA AREA

N

SHASTA RES. · KESWICK RES. · STONY GORGE RES. · EAST PARK RES. · BLACK BUTTE RES. · INDIAN VALLEY RES. · CLEAR LAKE · LAKE BERRYESSA · LAKE HENSHAW · LAKE TAHOE · LAKE ALMANOR · LAKE OROVILLE · FRENCH LAKE · BUCKS LAKE · LAKE DAVIS · LAKE VALLECITO · LAKE ALPINE · PARDEE RES. · CAMANCHE RES. · NEW HOGAN RES. · SALT SPRINGS RES. · LAKE TULLOCH · DON PEDRO RES. · LA GRANGE RES. · EXCHEQUER RES. · MERCED FALLS · LAKE MCCLURE · LAKE MCSWAIN · LAKE YOSEMITE · HENSLEY LAKE · MILLERTON LAKE · PINE FLAT RES. · KINGS RIVER · KAWEAH RIVER · TULE RIVER · KERN RIVER · KERN LAKE · BUENA VISTA LAKE · TULARE LAKE BED · SAN FRANCISCO BAY · SAN PABLO BAY · SUISUN BAY · PACIFIC OCEAN

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