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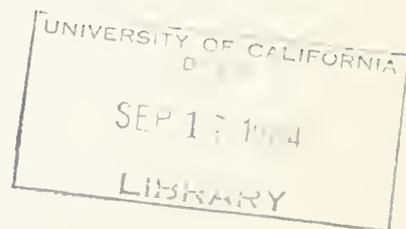


THE RESOURCES AGENCY OF CALIFORNIA
Department of Water Resources

BULLETIN No. 94-1

LAND AND WATER USE IN
TULE RIVER
HYDROGRAPHIC UNIT

FEBRUARY 1964



HUGO FISHER
Administrator
The Resources Agency of California

EDMUND G. BROWN
Governor
State of California

WILLIAM E. WARNE
Director
Department of Water Resources

State of California
THE RESOURCES AGENCY OF CALIFORNIA
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PREVIOUS SERIES 94 BULLETINS

Bulletin 94 series is being published by the Department of Water Resources for the information and use of all interested agencies and the general public. Earlier bulletins in this series are:

Bulletin No. 94-1, "Land and Water Use in Tule River Hydro-Unit", (Preliminary Edition)

Bulletin No. 94-2, "Land and Water Use in Trinity River Hydro-graphic Unit", (Preliminary Edition)

Bulletin No. 94-4, "Land and Water Use in Smith River Hydro-graphic Unit", (Preliminary Edition)

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WILLIAM E. WARNE
Director of
Water Resources

EDMUND G. BROWN
GOVERNOR OF
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THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

1120 N. STREET, SACRAMENTO
December 24, 1963

Honorable Edmund G. Brown, Governor,
and Members of the Legislature
of the State of California

Gentlemen:

I have the honor to transmit Bulletin No. 94-1, the first of a series of reports of the Department of Water Resources which present detailed basic data relative to land and water use and apparent water rights within certain hydrographic units of the State. This report, "Land and Water Use in Tule River Hydrographic Unit", presents results of studies conducted pursuant to legislation sponsored by Senator Edwin J. Regan and codified under Section 232 of the Water Code.

The preliminary edition of this bulletin was published in March 1962 and was subsequently distributed for review. In February 1963, the Department of Water Resources held a public hearing to receive comments from interested individuals and agencies on findings set forth in the bulletin. After consideration of these comments, necessary revisions were made. Pertinent comments received regarding the preliminary edition have been included as an appendix to the bulletin.

The information contained in this series of reports will provide a basis for future estimates of the amount of water which originates within each watershed, the amount which can be used beneficially within each area, and the amount of surplus or deficiency, if any. The completed series will provide invaluable reference material relating our water resources to land classification and use.

The data presented in this bulletin will help concerned interests determined how to best develop and use the water resources of the Tule River Hydrographic Unit. The bulletin discusses history, natural features, climate, and economy of the unit. Maps of present land use and land classification illustrate the text.

Sincerely yours,

A handwritten signature in cursive script that reads "William E. Warne".

Director

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

EDMUND G. BROWN, Governor
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WILLIAM E. WARNE, Director, Department of Water Resources
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by the
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Engineer

ACKNOWLEDGMENT

The Department of Water Resources gratefully acknowledges information contributed by the numerous water users and residents of the Tule River Hydrographic Unit and various agencies of the federal, state, and local governments.

Special mention is made of the helpful cooperation of the Tule River Soil Conservation District.

FOREWORD

In 1956, the State Legislature declared:

"... that in providing for the full development and utilization of the water resources of this State it is necessary to obtain for consideration by the Legislature and the people, information as to the water which can be made available for exportation from the watersheds in which it originates without depriving those watersheds of water necessary for beneficial uses therein...."

The Department of Water Resources was, therefore, authorized and directed to conduct such investigations as necessary to compile this information. To do so, the department began its statewide inventory of water resources and water requirements as outlined in the authorizing legislation (Water Code Section 232)..

For purposes of this inventory, the State has been divided into major hydrographic areas. These areas, in turn, have been subdivided into hydrographic units generally comprising watersheds of individual rivers. Basic data, consisting of land and water use, classification of lands, and streamflow measurements, are collected for each hydrographic unit. Results of this inventory will be presented in two series of reports covering (1) land and water use, and (2) water resources and water requirements.

The data on land and water use, together with land classification, are being published as the Bulletin 94 series; one for each hydrographic unit. The bulletins are first published in preliminary form, after which public hearings are held in the areas covered by the bulletins. Final editions of the bulletins are then published containing revisions and pertinent comments resulting from the hearings. This report is a final report covering the Tule River Hydrographic Unit and is the first in the 94 series. As the data relative to particular hydrographic units are published they become available for general studies and project investigations, not only by the department, but by all other parties concerned with the watersheds covered. When completed, this series of bulletins will provide detailed data for the whole State.

A second series of reports, each covering one or more hydrographic units, will include determinations of the available water resources and future requirements of those areas. The water resources will be determined from the records of older stream gaging stations and a number of new stations mainly on smaller streams not previously measured. The determination of water requirements will be based on land use patterns projected for specific points of time. These projections, in turn, will be based on the land and water use and land classification data, such as contained herein, and other available information.

Although the data developed by this inventory are to be used throughout the department's planning activities, they are most urgently needed for the staging of water projects. For this reason, the development of these data and their application to the timing of projects were combined in the Coordinated Statewide Planning Program. Under this program, determinations of the quantities of water available, and the time, place, and magnitude of the future water needs of the entire State are combined in the formulation of a sequence of projects to meet those needs. An interim staging report will be published in 1963-64.

CHAPTER I - INTRODUCTION

This bulletin presents basic data on land and water use in Tule River watershed above the San Joaquin Valley floor. This watershed is designated herein as the Tule River Hydrographic Unit. The data cover present land use, classification of lands, systems used to divert Tule River and tributary surface waters, histories of diversions, water rights pertinent to each diversion, purpose and extent of use of diversions, seasonal quantities of water diverted during 1957-58, and an estimate of present consumptive use of water in the unit. A general description and a brief history of the area are also included.

These basic data were gathered during the period from 1956 to 1958 in compliance with Chapter 61, Statutes of 1956, as amended by Chapter 2025, Statutes of 1959, and codified in Section 232 of the Water Code of the State of California. This legislation provides for an inventory of water resources and water requirements of the State. This is the first of a series of bulletins to be prepared under this authorization. The text of Section 232, with a discussion of its history and implications, is included in this bulletin as Appendix A.

These data will provide the basis for future determination of the quantities of water reasonably required for future beneficial use within the Tule River Hydrographic Unit. Preliminary estimates of these quantities were published in Department of Water Resources Bulletin No. 82, "Upper Tule River Reconnaissance Investigation", November 1960. The final determination

will be based on estimates of future (1) land use, (2) economic patterns, (3) population, (4) industrial and agricultural development and (5) recreational needs.

The data presented herein have been reviewed in preliminary form by the Tulare County Board of Supervisors, the Tule River Soil Conservation District, and local water users. These groups and individuals submitted suggested changes which were reviewed in the field and adjusted where the original data were found to be incorrect.

Organization of Report

This bulletin consists of five chapters, five appendixes and three plates. Chapter I contains a general description of the Tule River Hydrographic Unit. Chapter II, "Water Use", presents data on surface water diversion systems, related apparent water rights, measurements of quantities of water diverted, and an analysis of consumptive use and irrigation efficiency. Chapter III, "Land Use", describes the history of land use within the unit, and sets forth tables of present land use. Maps prepared in connection with Chapters II and III delineate the areas of various present land uses and the locations of diversion systems. Chapter IV, "Land Classification", includes a tabulation of lands classified with regard to their potential for irrigated agriculture and for recreational purposes. Maps prepared for this chapter delineate the respective classes of land grouped into several major categories. Chapter V, "Summary", summarizes the report.

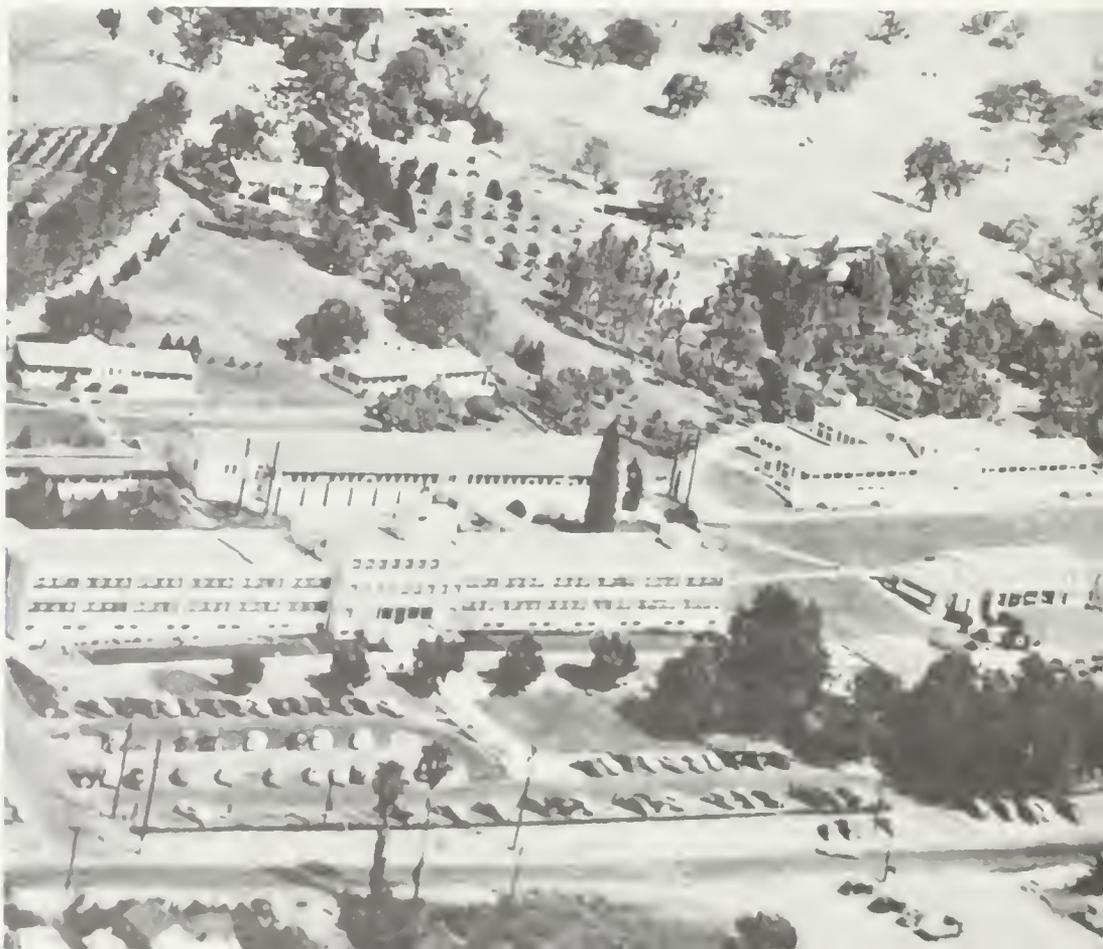
Appendix A presents the text of Section 232 of the California Water Code and a discussion of the pertinent responsibilities and work program of the Department of Water Resources. Appendix B is a bibliography of publications pertinent to the Tule River Hydrographic Unit. Appendix C presents details of certain diversions. The diversions are arranged alphabetically by owner or operating entity. Appendix D presents a short summary of California water law, a review of litigation involving water rights in the Tule River Hydrographic Unit, and a tabulation of applications to appropriate water in the unit. Appendix E presents pertinent comments received at the public hearing held in Springville, California, together with those written comments which were submitted to the Director of the Department of Water Resources.

General Description of Area

The Tule River Hydrographic Unit, shown on Plate 1, "Location of Unit", lies in south-central Tulare County, within the Tulare Lake drainage basin. The unit, with an area of 392 square miles, is drained by the Tule River and its three major tributaries, the North Fork, Middle Fork, and South Fork. These three forks and the Tule River meander on a generally westerly course toward Tulare Lake, a playa now modified by levees and largely reclaimed for farming. The annual and monthly flows of the river are extremely variable, with many



Success Dam,
April 1961



Tulare and Kings
Counties Hospital,
Springville

periods of no recorded flow. As the result of frequent diversions along the course of the river, the permeable alluvium of the river bed, and the infrequency of heavy runoff, surface waters seldom reach Tulare Lake.

The Tule River Hydrographic Unit is bounded by the watersheds of the Kaweah River on the north, the Kern River on the east, and Deer Creek to the south and southwest, as shown in detail on Plate 2, "Land and Water Use". Success Dam, now under construction by the U. S. Corps of Engineers, at the eastern edge of the San Joaquin Valley floor about five miles east of Porterville, forms a part of the boundary to the southwest.

For purposes of convenience and utility in reporting data, the unit has been subdivided into six subunits. General locations of these subunits are shown on Plate 1. The area of each is listed in Table 1.

TABLE 1
AREAS OF SUBUNITS IN
TULE RIVER HYDROGRAPHIC UNIT

Subunit	: Area : in acres	: Area : in square miles
Middle Fork	54,100	85
Springville	21,400	33
North Fork	59,100	92
Success	36,400	57
Reservation	65,100	102
South Fork	<u>14,600</u>	<u>23</u>
TOTAL	250,700	392

Historical and Present Development

The earliest activity of white man in the Tulare Lake Basin was the trapping of fur-bearing animals about 1830. Prior to that time Indians, mostly of the Yokuts tribe, were the only inhabitants. In 1856, at the time farming in the general area began to develop, the first Indian reservation was established just east of Porterville. It is estimated that the Indian population at that time was about 2,000. In 1873 the Indian reservation was moved to its present Tule River location. At the current time, about 320 Indians have claim to the reservation, but only about one-half of these are in residence.

Agricultural development in the Tule River Hydrographic Unit started in the late 1850's, and has been the largest single commercial enterprise. Mining, lumbering, and recreation have also been pursued on a commercial basis.

Springville, located about 16 miles east of Porterville at an elevation of about 1,100 feet, was named for a soda spring located about one mile below the junction of the North and Middle Forks of Tule River. The waters of the spring, which are still flowing, were noted in early days for their agreeable taste and curative properties. The original settlement in the area was located about one mile below Springville, and was named "Daunt" after William A. Daunt, a pioneer settler who opened a store there in the 1860's. The first post office was located at the store and also named "Daunt".

The earliest map of Springville was recorded in 1871, and the map of a later addition to the town was filed by A. M. Coburn in 1891. While the prospective value of the spring was one of the inducements for the purchase of lots in the Coburn Addition, the vision of a famous "spa" did not materialize. However, Mr. Coburn built a box factory and planing mill and sold lots and lumber on easy terms to his employees. Consequently, a number of houses were built and the nucleus of a town was started. In 1890 the post office was moved to Springville, and in about 1895 the post office name was changed to "Springville".

Mining activity in the area has been sporadic. Much of the area is still unexplored geologically and mineral resources have not been tapped to any great extent. During World War I, Tulare County was a major producer of domestic magnesite. A significant portion of this ore was mined from the upper Tule River area. Other mineral deposits in the area include copper, gold, manganese, tungsten, uranium, thorium, zinc, lead, silver, barite, clay, graphite, limestone, and sand and gravel. Most of the mineral deposits, with the exception of sand and gravel, are now of insufficient commercial value or in such inaccessible areas that their present development is impracticable. Mining therefore, except for a few prospects, is at a standstill.

The mountains in the eastern portion of the Tule River Hydrographic Unit contain much pine, fir, and giant sequoia saw timber. Two of the first lumber mills were built

in the 1860's in the northeastern portion of the unit by James R. Hubbs and Nathan Dillon. Lumbering has continued to the present day. Recently, there were two moderate-sized lumber mills and an additional small mill operating in or near Springville. Now, however, both of the larger mills have moved from the area, reportedly because the stumpage charge was too high for profitable operation and highway regulations held log truck loads to an unprofitable minimum size. One of the mills moved to the Tule River Indian Reservation, where a private logging road was constructed connecting the area near Camp Nelson with an existing road along the South Fork Tule River. The remaining small mill continues in operation immediately below Springville.

Early promiscuous cutting of giant sequoias prompted the people of the area to petition the federal government to protect the timber. As a result, a national forest preserve was established in 1893. A portion of this preserve later became Sequoia National Forest which includes most of the timber resources of Tulare County and constitutes a large portion of the mountainous terrain in this unit. Sequoia National Park, the southern portion of which is within the watershed of Tule River, was established in 1890. No roads extend to this undeveloped portion of the park. A 470-acre parcel of timberland, now known as Balch Park, was donated to Tulare County in 1923. This land is relatively undeveloped at present, but contains one of the largest of the giant sequoias called "Old Methuselah".

For many years, recreation has been a commercial enterprise in the mountainous area of the Tule River Hydrographic Unit. In 1884, Andrew Jackson Doty built the Mountain Home Resort near the location of Balch Park. After stage service was inaugurated, it was estimated that some 800 guests visited the resort each summer. Several hundred others visited J. J. Doyle's Summer Home Resort on the North (Doyle) Fork of Middle Fork Tule River, and John Nelson's Camp Nelson Resort on the South (Nelson) Fork of Middle Fork Tule River. The mountain resorts declined in the early days of the automobile because of poor roads, and Mountain Home Resort was closed in 1908. It is now part of Mountain Home State Forest.

Improvements in roads and automobiles have increased the popularity of this mountainous area. The recreational potential has also been enhanced by development of camp sites by the United States Forest Service and establishment of Moorehouse Springs State Fish Hatchery. Quaking Aspen Camp, near the Kern River divide, is the jumping-off point for parties packing into the upper Kern River country. A highway has been suggested between Quaking Aspen Camp and Lone Pine or Olancho. Such a highway would open a large recreational area presently inaccessible by automobile and would cut about 200 miles off the trip from Porterville to Lone Pine.

Most of the water supply in the Tule River Hydrographic Unit has been obtained from unregulated stream flow and is used chiefly for irrigation and for generation of

hydroelectric power at two powerplants. The first diversion for irrigation was by Sardis Wilcox (Wilcox-South Fork Ditch) for irrigation of potatoes in 1858. The Tule Powerhouse of the Southern California Edison Company began operation in 1909, and the Tule River Powerhouse of the Pacific Gas and Electric Company was placed in service in 1914.

There are a large number of small reservoirs in the unit, used either primarily for stockwatering or for storage incidental to a direct stream diversion, but there are no existing large size reservoirs. However, Success Dam, which is being constructed by the United States Corps of Engineers, will create a reservoir of 80,000 acre-foot capacity. The dam is to be 150 feet in height above a stream bed elevation of about 540 feet. Success Dam and Reservoir is primarily a flood control project to control floods on the valley floor in the vicinity of and downstream from Porterville. However, there will be a nominal conservation benefit of new water resulting from a saving in excessive evaporation from Tulare Lake.

Tule River water which flows out of the hydrographic unit serves to supply direct diversions outside the unit, to recharge ground water in the San Joaquin Valley, and to supply water to Tulare Lake in occasional flood periods. Inflow to Tulare Lake is now regulated by Pine Flat Reservoir on the Kings River and Isabella Reservoir on the Kern River, and will be further regulated by Success Reservoir on the Tule River and by Terminus Reservoir on the Kaweah River.

The present population of the Tule River Hydrographic Unit is estimated to be 2,000 in addition to about 250 patients of Tulare and Kings Counties Hospital. In addition to the hospital patients about 1,000 people reside in Springville, the largest community in the area.

Natural Features

The Tule River rises in the massive granitic rocks of the Sierra Nevada at a maximum elevation of about 10,000 feet, and flows to an elevation of about 540 feet at Success Dam. For the most part the terrain of the Tule River watershed is very rugged and mountainous. Valley and foothill lands constitute on the order of one percent and six percent, respectively, of the total area. Some of the less steeply sloping, wooded mountain lands, above 5,000 feet elevation, are suitable for home sites. Agriculture, the largest single commercial enterprise in the unit, is largely confined to lands below 2,000 feet in elevation. Approximately one-fifth of the agricultural lands are dry-farmed; four-fifths are irrigated. Major irrigated crops are pasture and subtropical orchard. Lumbering and recreation are also important local activities.

Soils of the Tule River Hydrographic Unit have been derived from rocks of the western slope of the Sierra Nevada. These rocks are principally Mesozoic granitic intrusives with

some pre-Cretaceous metamorphic rocks in the southwestern portion of the unit, principally along the South Fork Tule River and in the vicinity of Success Dam. The soils may be segregated into three broad groups; residual soils, Recent alluvial soils, and older flood plain soils.

The residual soils of the rolling-hill and mountainous portions of the unit were formed in place from the weathering and decomposition of parent rocks. Most of these soils are coarse-textured and well-drained. Soil depths vary from very shallow and rocky in the low-elevation, low-rainfall foothills located in the western portion of the unit to very deep on the timbered, high-rainfall, high-elevation, mountainous areas to the east.

A number of relatively small and irregular bodies of deep well-drained coarse-textured alluvial fan soils occur along the existing stream channels. Agricultural development on these soils has been limited because of the hazards of erosion and flooding from the adjacent stream courses.

The soils occurring at lower elevations, on the smooth to gently undulating lands southwest of Springville, were formed from older alluvial flood plain materials. These soils are characteristically fine-textured and have moderately dense subsoil clay layers.

Climate

The climate of the Tule River Hydrographic Unit is characterized by long, dry summers and cool, rainy winters.

Lumber Mill on
Tule River
Indian Reservation



Tule River
Hydrographic Unit
viewed from the
South Fork Tule River
(looking northeast)

From 85 to 90 percent of the precipitation occurs from November through April. There is some summer thundershower activity at the higher elevations, but the total precipitation from these storms constitutes only a small percentage of the annual total. At higher elevations most of the precipitation occurs as snow, the average winter snow line elevation being about 6,500 feet. Annual precipitation varies from about 15 inches at lower elevations in the western portion of the unit between Porterville and Springville to somewhat in excess of 50 inches at an elevation of 8,000 feet in the eastern portion.

Several precipitation stations of long record are located within or near the Tule River Hydrographic Unit. Table 2 shows the range in mean annual precipitation and its correlation with elevation in and adjacent to the unit.

TABLE 2

MEAN ANNUAL PRECIPITATION AT SELECTED STATIONS
IN OR NEAR TULE RIVER HYDROGRAPHIC UNIT

Location	:Elevation, : in feet	: Mean annual precipitation, : in inches of depth*
Porterville	393	10.71
Springville Ranger Station	1,050	17.65
Tule River Intake (Southern Califor- nia Edison Co.)	2,450	30.51
Springville Tule Headworks (Pacific Gas and Electric Company intake near Camp Wishon)	4,070	36.98

*Mean period 1905-1955. "Mean Period" is a period which is believed to represent conditions of water supply and climate over a long period of years.

Mean annual temperature at lower elevations in the Tule River Hydrographic Unit is about 60° F., decreasing with increasing elevation.

The growing season varies from approximately 250 days in the vicinity of Porterville and Springville to about 130 days in the high mountain meadows in the eastern part of the unit. Summer frosts are not uncommon at these meadows.

Water Resources

The water resources of the Tule River Hydrographic Unit comprise the flow in the Tule River and its tributaries and a limited amount of ground water which has been developed for irrigation in Frazier Valley and along the North Fork Tule River. Small amounts of ground water have been developed throughout the unit for domestic purposes.

There are several stream gaging stations located on the Tule River. The locations of these stations are shown for reference purposes on Plate 2. The station "Tule River near Porterville" has been inundated by Success Reservoir, but the upstream station "Tule River near Springville" which was placed in operation in 1957, measures essentially the same streamflow. Following construction of Success Dam, the location of the station "Tule River at Worth Bridge" was moved upstream to the dam and is now known as "Tule River below Success Dam". The new location is not shown on Plate 2. As is pointed out in the discussion of the Statewide Water Resources and Water Requirements Program in Appendix A, the station

"North Fork Tule River at Springville" was constructed as part of this investigation in February 1957.

This brief description of water resources is limited to summarizing the records of one of the stream gaging stations to indicate the general characteristics of runoff in the unit, and to compare runoff in 1957 with average conditions.

The long record from 1901 to 1958 of flow in Tule River, which was measured at "Tule River near Porterville", is illustrative of runoff conditions in the unit. About two-thirds of the Tule River Hydrographic Unit is above the location of this station.

It is of interest to note that, on the average, 86 percent of the annual runoff at this location occurs between January and June and that the runoff in the maximum month of record, March 1943, exceeded the total annual flow in 31 of the 57 years of record.

Runoff in the Tule River in the 1956-57 year at this station was 53,460 acre-feet or 52 percent of the average. Runoff during the period June through October, when flow in the river is usually most critical as regards its adequacy to supply the demands placed upon it within the unit, was 8,900 acre-feet or about 63 percent of the average in 1957. During this period, runoff at the station exceeded runoff for the corresponding period in 25 of the 57 years of record. The flow recorded in the month of June 1957 exceeded the corresponding flow in 27 of the 57 years of record.

Similarly the runoff during the months of July, August, September, and October 1957 exceeded the runoff during the corresponding months in 18, 22, 26, and 40 years, respectively, of the total 57 years of record. Thus, during the summer of 1957, runoff in Tule River was fairly close to the average.

Pertinent information obtained from the record of the station "Tule River near Porterville" is summarized in the following table:

	<u>Acre-feet</u>	<u>Percent of average</u>	<u>Cubic feet per second</u>
Average runoff for period of record, 1901-02 through 1957-58	103,500	100	
Runoff in minimum year of record, 1930-31	13,930	13.5	
Runoff in maximum year of record, 1905-06	340,000	329	
Runoff in driest 6- month period of record, June - November 1931	320		
Runoff in wettest 6- month period of record, January - June 1906	297,000		
Runoff in maximum month, March 1943	92,440		
Maximum instantaneous flow of record, November 19, 1950			25,500
Minimum instantaneous flow of record; parts of 1934, -35, -47, -50, -55, -56			0

Local Public Agencies Concerned with Water Development

Two local public agencies in the Tule River Hydrographic Unit are engaged in water development or similar fields. The Springville Public Utility District operates a municipal water supply system for residents of Springville. The Tule River Soil Conservation District was formed in 1955 to promote erosion control, to foster good irrigation practices, and generally to aid agriculture by utilizing the services of the federal Soil Conservation Service. The district covers some 237,000 acres, constituting almost the entire unit. While not specifically engaged in water development, the district has assisted farmers in the construction of many small water conservation reservoirs.

CHAPTER II - WATER USE

Present water requirements in the Tule River Hydrographic Unit are met almost entirely by diversion of surface runoff, but ground water supplies a limited portion of the needs. For this investigation a survey was made of the systems established for the diversion of stream flow. These diversions are shown on Plate 2. Survey data reported herein include diversion locations, descriptions, uses, amounts of water diverted, and water rights information relating to diversions. Diversions of water for all purposes are reported, with the exception of those which involve less than approximately 10 acre-feet per season.

Quantities of water diverted were measured in order to further describe the diversion systems. The measured quantities do not necessarily represent average diversions. In general, the amounts of water diverted are greatly affected by the available stream flow. Such flow in the Tule River during the summer of 1957 was fairly close to average. Factors other than available water supply, such as economic factors, may also affect the degree to which any diversion record represents typical operating conditions. No attempt was made to assess these factors. Generally the diversion quantities reported are the actual amounts of water taken from the respective sources, and therefore include the recoverable and irrecoverable losses incidental to the primary uses, which may be consumptive, such as irrigation, or nonconsumptive, such as the production of hydroelectric power.

The location of water wells and the measurement of their production were not covered in this investigation. However, the areas of lands irrigated by water from all sources, including underground sources, were determined in the land use survey. Consumptive use of water from all sources was estimated by applying average unit use factors to the acreages reported in these surveys. The results are presented later in this chapter. The limited acreage irrigated by ground water is shown in the tables in Chapter III, and is delineated on Sheets 2 and 3 of Plate 2.

The only urban water service in the unit is that provided the community of Springville by the Springville Public Utility District through "Springville Pipe". This diversion is described later in this chapter and in Appendix C. Most of the rural domestic uses are supplied by small, individually-owned wells.

Water Rights

Data were obtained with respect to apparent water rights in connection with the surface water diversions described herein. These rights may be based on appropriation or on riparian status, and may have been defined by adjudication proceedings. The California law of water rights, including both surface and underground water, is described briefly in Appendix D.

Water rights are rights in property which, because of their often obscure establishment, are frequently the subject of controversy and litigation. Many of the water rights in the Tule River Hydrographic Unit have been adjudicated by legal actions involving determinations of the rights to the use of water, and others have been defined by private agreements. Three major suits have, to a degree, established the rights of a number of water users within and downstream from the unit. Although the decrees involve different parties and are not completely compatible, they do provide the basis for priorities of diversion which, in practice, apparently provides a reasonably satisfactory apportionment of the waters. These actions are further described in Appendix D.

Most of the water use in the unit is based on riparian rights or on appropriative rights established prior to 1914, when the Water Commission Act was passed. Such appropriative rights were initiated by actual diversion and beneficial use of water, or by posting notice of an intended appropriation at the point of diversion and recording such notice in the office of the recorder of the county. Since the passage of the Water Commission Act, 31 applications for a total diversion of 4.219 cubic feet per second and 2 applications for total storage of 47 acre-feet per annum have been granted licenses or permits. Four more applications, two for diversion and storage at Success Dam, and two for diversion of small quantities for domestic use, make a total of 37

currently valid applications, but these latter applications had not been acted upon as of the date of publication of this report. All the applications are tabulated in Appendix D, Table D-1. Action on 21 additional applications was pending during the period of this investigation, but in a decision rendered by the State Water Rights Board on June 30, 1961, all of the applications were denied. Nineteen of these were for storage and two were for direct diversion for domestic purposes. Most of the storage applications were for small farm reservoirs, many of which have been constructed.

Surface Water Diversions

During the survey an attempt was made to locate and obtain data with respect to all diversions of more than 10 acre-feet per year. All diversions actually in use in 1957, plus those which had been used within the preceding five years, were included. The date of last use of discontinued diversions, if known, is recorded herein. Direct diversions, as well as those involving significant surface storage, were located. All reservoirs which had surface areas of about three or more acres were mapped. Three acres is approximately the minimum area which can be determined with reasonable accuracy by the methods utilized. Reservoirs located along and operated in conjunction with canals and ditches are shown on the land and water use maps, but are not considered as separate systems

and are not assigned location numbers. Similarly, supplies obtained from small, intermittent streams intercepted by canal systems, which add to the primary diverted supply, are not classed as separate diversions.

In situations where water users have made efficient use of water by rediverting field runoff or spill collected from their own upstream diversion systems, the point of rediversion is neither located on the maps nor assigned a number. If return flow from another water user's operation is rediverted, or if there is doubt as to the origin of the water, the diversion is delineated and assigned a number. Diversion systems of water companies or groups of water users are considered as single units; individual customer distribution points are not shown on the maps.

A total of 69 stream diversions were located in the Tule River Hydrographic Unit in 1957. These may be categorized by primary use as follows:

<u>Primary use</u>	<u>Number of diversions</u>
Irrigation and/or stockwatering	60
Urban water supply (Springville)	1
Recreation (fish hatchery and resort)	2
Hydroelectric power production	5
Export for irrigation outside of unit	<u>1</u>
TOTAL	69

Points of diversion and main canals or pipelines used to convey water from them are delineated on the four sheets of Plate 2, which cover parts of Townships 19 through 22 South, respectively. The diversions are listed in Table 3.

Numbering System for Surface Water Diversions

Surface water diversions are numbered to indicate their approximate location by township, range, and section within the federal land survey system. In this report, each section is subdivided into 40-acre plots and lettered as shown in the legend on each sheet of Plate 2. Diversions are numbered within each of these 40-acre plots according to the order in which they were located. For example, diversion 20S/29E-14J1, shown on Sheet 2 of Plate 2 as "14J1", is the first diversion located in the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 14 in Township 20 South, Range 29 East, Mt. Diablo Base and Meridian (MDB&M).

Descriptions of Surface Water Diversions

Description, history, and other information relating to surface water diversions were obtained by field inspection, interview with water users or their representatives, and reference to prior reports and official records. The data in Table 3 are arranged by diversion location number within each subunit. An alphabetical index of diversion owners and diversion names is included at the end of this chapter. The index lists the location of each diversion by subunit, and the references to map and page numbers on which the diversion data appear.

The purpose or purposes of each diversion, the quantity of water diverted during the period from April 1957 through March 1958, the extent of use, such as the number of acres irrigated, and the method of application of water are included in Table 3. If the purpose listed is not the usual use for that diversion, notation is made in the remarks. The extent of domestic use is specified only when five or more connections are served. Stockwatering of less than 10 head of livestock is considered to be a domestic use. The extent of irrigation use is based on the land use survey described in Chapter III.

The type of water right under which the respective diversions are considered to be made is indicated in Table 3 as the "apparent water right". The determination of this item is based upon the best information available from the owner, from files of the State Water Rights Board, from court decrees and other official records, and from other sources. The actual amount of the right, if established and known, and a reference to the source of data are also included. Although this information is believed to be accurate, it is emphasized that it is not based on sworn claims or testimony and should in no way be construed to represent a conclusive determination of water rights.



Canyon of the South
Fork Tule River at
the Tule River Indian
Reservation Boundary



Southern California
Edison Company
Diversion 20S/30E-26D1
on South Fork of
Middle Fork Tule River

Diversions for which water rights have been adjudicated are listed in Table 3 as "adjudicated". Those based on appropriative rights which have not been adjudicated, are listed as "appropriative". Those neither adjudicated nor appropriated, for which the area of use is apparently riparian are listed as "riparian". Diversions listed as adjudicated or appropriative may also be riparian, although no attempt was made in such cases to determine the riparian status.

In the case of an adjudicated right, the amount of the decreed right is tabulated. For an appropriative right the amount tabulated is that found in the filing, if any, or in the application, or in the latest permit or license which may have been issued in connection therewith. The reference given for an appropriation initiated after the effective date of the Water Commission Act (1914) is the number of the application on file with the State Water Rights Board. For appropriations prior to 1914, the reference, if known, is the book and page number of the official county record in which the filing is recorded. Such filings were made in accordance with Sections 1410 and 1422 of the Civil Code as enacted in 1872, which preserved the priority of a diligent appropriator from the time of filing and enabled him to prevail over a concurrent nonstatutory appropriator.

Detailed information with respect to diversions, which could not be adequately presented in Table 3, is included in Appendix C. Footnotes in Table 3 refer to items which are described in that appendix.

TABLE 3

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Location number and/or Plate 2 sheet number	Division name and/or owner	Source	Water use April 1957 - March 1958		Amount diverted in acre-feet	Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use		Type	Amount	Reference			
<u>M. D. B. & M.</u>						Middle Fork Subunit					
20S/30E-26D1 (Sheet 2)	Tule Powerhouse Conduit; Southern California Edison Company	South (Nelson) Fork of Middle Fork Tule River	Power	2,500 kw installed generating capacity*	23,580*	Approp.	(**)	(**)	1909	Gravity; concrete and rubble dam 6 feet high, 125 feet long, with 7.0 miles of 108-inch diameter semi-circular metal flume and penstock.	Reported amount diverted includes all water diverted by 20S/30E-26D2. Combined supply used for purpose indicated.**
20S/30E-26D2 (Sheet 2)	Tule Powerhouse Conduit; Southern California Edison Company	North Fork of Middle Fork Tule River	Power	(*)	(*)	Approp.	(**)	(**)	1939	Gravity; concrete and rubble dam 45 feet long with 300 feet of 108-inch diameter semi-circular metal flume connecting with conduit from 20S/30E-26D1.	Details of use and amount diverted reported under 20S/30E-26D1.**
20S/31E-7Q1 (Sheet 2)	Tule River Powerhouse Conduit; Pacific Gas and Electric Company	North Fork of Middle Fork Tule River	Power	4,800 kw installed generating capacity	23,500*	Approp.	5,000 MI	Bk. B of Water Rts., Pg. 311a	1911	Gravity; concrete dam 6 feet high, 20 feet long, with 8- by 50-foot earthfill wing dam and 3.8 miles of conduit consisting of covered concrete canal, flume, tunnel, wood-stave pipe, and penstock.	Reported amount diverted includes all water diverted by 20S/31E-18B1 and 20S/31E-18D1. Combined supply used for purpose indicated.**
20S/31E-18B1 (Sheet 2)	Tule River Powerhouse Conduit; Pacific Gas and Electric Company	Hossack Creek	Power	(*)	(*)	Approp.	1,000 MI	Bk. B of Water Rts., Pg. 33a	1903	Gravity; concrete and rock dam 8 feet high, 15 feet long, with redwood flume connecting with 20S/31E-7Q1.	Details of use and amount diverted reported under 20S/31E-7Q1.**
20S/31E-18D1 (Sheet 2)	Tule River Powerhouse Conduit; Pacific Gas and Electric Company	Summit Meadow Springs and North Fork of Middle Fork Tule River	Power	(*)	(*)	Approp.	3.0 cfs	A-11,68b	1919	Gravity and pump; small concrete diversion structure at springs located about 100 feet north of river, 4-inch pipe to 7- by 75-foot concrete diversion dam with 75-foot earthfill wing dam and 150-hp electric-powered pump on river. Eleven hundred feet of 18-inch pipe connects pump with conduit from 20S/31E-7Q1.	Details of use and amount diverted reported under 20S/31E-7Q1.**
20S/31E-27U1 (Sheet 2)	Camp Nelson Water Company	Belnap Creek	Domestic Beer.	210 summer homes Swimming pool	150	Approp.	25 MI**	(**)	1932	Gravity; small concrete diversion structure with 0.7 mile of 4-inch pipe to a 65,000-gallon tank.	(**)
20S/31E-27Q1 (Sheet 2)	Camp Nelson Resort J. W. Greer	Belnap Creek and spill from 20S/31E-27U1	Irrig. Stock.	27 acres by flooding --	60	Approp.	75 MI*	Bk. A of Water Rts., Pg. 163a Bk. 472 of Off. Rec., Pg. 297a	About 1890	Gravity; concrete dam 5 feet high, 10 feet long, with 1.0 mile of earth ditch and 0.5 mile of pipe. Spill from 20S/31E-27U1 enters ditch about 0.4 mile from dam.	former owners: John W. Nelson, Charles B. Smith. Water right consists of 100 MI appropriation less first 25 MI sold to Camp Nelson Water Company (Diversion 20S/31E-27U1) in 1932.

* - See remarks.

** - For additional information see Appendix C. *Detailed Descriptions of Certain Surface Water Diversions.* For lettered footnotes, see last page of table.

TABLE 3 (Continued)

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Location number and/or Plot 2 sheet number	Diversion name and/or owner	Source	Water use April 1957 - March 1958		Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount			
M D B & M					Middle Fork Subunit (Continued)					
20S/31E-30R1 (Sheet 2)	Moorehouse Springs Fish Hatchery; California State Department of Fish and Game	Moorehouse Springs Tule River	Fish hatchery	Trout culture	700	Adjud.	--	1945	Gravity; concrete-boxed spring with 600 feet of 8-inch pipe.	Land leased from Riverside Cement Company.
20S/30E-31E1 (Sheet 2)	Akin Ditch W. F. Bielebach	Middle Fork Tule River	Irrig. Stock.	27 acres by sprinkler	289	Adjud.	50 MI Par. 10 ^c	1884	Gravity; concrete dam 4 feet high, 60 feet long, with 1.0 mile of 12- and 18-inch pipe and earth ditch.	Former owners: James M. Akin, Ruben L. Hudson.
20S/30E-31E2 (Sheet 2)	Elster-Webb (Rutherford) Ditch W. F. Humbley	Middle Fork Tule River	Irrig. Stock.	91 acres by flooding and furrow	344	Adjud.	60 MI Par. 31 ^c	Prior 1915	Gravity; masonry dam with 2.3 miles of earth ditch and flume.	Diversion also known as Rutherford Ditch. Former owners: George W. Fink, Orin J. Webb, Charles A. Elster. Portion of amount diverted supplements 20S/30E-31E1. Reported amount diverted is total for period of irrigation 5/1/57 - 11/27/57 only.
20S/30E-31E1 (Sheet 2)	Long Canyon Ditch W. F. Humbley	Long Canyon Creek	Irrig.	11 acres by flooding	38	Approp.	0.54 cfs A-9931b	1910	Gravity; concrete and masonry dam 8 feet high, 24 feet long, with 0.4 mile of earth ditch.	Area irrigated received supplemental supply from 20S/30E-31E2.
21S/31E-1D1 (Sheet 3)	Mt. Whitney Ditch; Mt. Whitney Ditch and Water Company	Middle Fork Tule River	Irrig. Stock.	2.1 acres by flooding, furrow, and sprinkler	1,465	Adjud.	3.38 cfs Par. VIII ^d	About 1880	Gravity; rock and sheet-metal dam 2 feet high, 30 feet long, with 6.3 miles of earth ditch and pipeline.	Former owners: John R. Hubbs, Frank Conlee, Andrew J. Dohy. Portion of reported water right exercised by diversion through Springville Pipe, Diversion 21S/30E-6D ₂ .
21S/31E-2F1 (Sheet 3)	Walker Ditch A. J. Stillison	Tule River	Irrig. Stock.	17 acres by flooding	227	Adjud.	26.67 MI ^f Par. (*)	1871	Gravity; concrete dam about 6 feet high, with 0.4 mile of earth ditch. Dam also used for 21S/29E-2E ₂ .	Diversion also referred to as Talley Ditch. Former owners: Walker, A. M. Coburn, Louis Heber, Henry Talley, Frank Talley, Eva Sechrest, W. W. Bowen. The two water right amounts reported are 2/3 of those adjudicated to the Walker Ditch by Par. 18 ^b , Case No. 702 ₂ , and Par. 3 Case No. 1801 ₂ , respectively.
21S/31E-2F2 (Sheet 3)	Frank N. Kibler	Tule River	Irrig. Stock.	10 acres by sprinkler	75	Adjud.	4.0 MI ^g Par. 19 ^c	Prior 1916	Gravity; concrete dam about 6 feet high, with 0.1 mile of earth ditch and ramp. Dam also used for 21S/29E-2E ₁ .	Former owners: C. A. Davidson, S. L. Gaynabin. Case No. 7001, decreed 5.0 cfs for power of which 2.0 MI could be used for irrigation. Power right not now exercised.

* - See Par. 19^c.

** - For additional information see Appendix C, "Detailed Description of Certain Surface Water Divisions," Part referred to in text, see last page of table.

TABLE 3 (Continued)

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN TULE RIVER HYDROGRAPHIC UNIT

Location number and plot 2 sheet number	Diversion name and/or owner	Source	Water use April 1957 - March 1958		Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount			
215/29E-11 (Sheet 1)	Jabara-Born Ditch	Tule River	Irrig. Recr. Stock.	693 acres by flooding, furrow, and sprinkler* Fishing ponds	2,525*	Adjud. Adjud. Adjud.	1.32 cfsf Par. VIII 10.0 cfsf Par. XIII 6.0 cfsf Par. 26c 6.0 cfsf Par. 4e	1871	Gravity; rock dam with 8.0 miles of earth ditch and pipeline.	Amount diverted used to irrigate 66 acres jointly with 215/29E-14B1 (Successor Subunit) in addition to the reported area irrigated.**
215/29E-11E1 (Sheet 3)	Pleasant Valley Ditch; Pleasant Valley Canal Co.	Tule River	Irrig. Stock.	714 acres by flooding, furrow, and sprinkler	2,755*	Adjud. Adjud. Adjud.	13.64cfsf Par. VIII 5.0 cfsf Par. 22c 6.0 cfsf Par. 1 & 2e	About 1870	Gravity; concrete dam 3 feet high, 25 feet long, with 8.0 miles of earth ditch.	Reported amount diverted includes water for the Volney Baker right owned by Hugh T. Gordon.**
215/29E-11H1 (Sheet 3)	Walter M. McNab and Claude A. Rouch	Tule River	Irrig. Stock. Recr.	47 acres by furrow and sprinkler Fishing in reservoir	93*	Adjud. Riparian	(*)	Prior 1870	Gravity, pump and storage; small dam and 0.1 mile of earth ditch to 15-hp electric-powered pump and alternate waterwheel-driven pump with 0.3 mile of 6-inch pipe and 10-acre-foot reservoir.	Former owners: Clyde Baker, A. V. Wood. Reported amount diverted is that by electric-powered pump only. Waterwheel pump lifts a portion of the ditch flow required for its operation. Predecessor was mentioned in Case No. 1801B as being entitled to a reasonable riparian use but no diversion entitlement was specified.
215/30E-10L1 (Sheet 3)	Duncan Ditch Squaw Stock Farm	Tailrace of Tule Powerhouse (30E)	Irrig. Stock.	120 acres by flooding	760*	Adjud.	90 MI	About 1860	Gravity; short 12-inch steel pipe and a 2-inch steel pipe from Tule Powerhouse tailrace, and 1.1 miles of earth ditch.	Former owners: Harry E. Sickles, Charles A. Elster. Diverts from Tule Powerhouse tailrace in lieu of direct diversion from Middle Fork Tule River. Reported amount diverted is total for period July 1957 - March 1958 only.
215/30E-10L2 (Sheet 3)	Springville Pipe Tulare County	Tailrace of Tule Powerhouse (30E)	Munic.	About 1,250 persons	322*	(**)	(**)	1924**	Gravity; 200 feet of 16-inch and 1.0 mile of 12-inch pipe from Tule Powerhouse tailrace to water treatment plants.	Of the amount diverted, 90 acre-feet were used by Tulare and Kings Counties Hospital and 232 acre-feet were used by Springville Public Utility District.**
195/29E-10L1 (Sheet 1)	Flax-Cole Ditch W. A. McCulloch	Kramer Creek	Irrig. Stock.	18 acres by furrow and flooding, 100 head	72*	Riparian	---	About 1860	Gravity; rock dam 1 foot high diverts to ditch from 195/29E-24M1.	Former owners: James Flax, Frank Flagg, P. Flagg, Roberts, Walter Street, Brown, Helman Bank of Los Angeles. Reported amount diverted includes all water diverted by 195/29E-24M1. Combined supply used for the purposes indicated.
195/29E-10L1 (Sheet 1)	Dillon Ditch (spring) Harry C. Scruggs	Spring tributary to North Fork Tule River	Irrig. Stock.	20 acres by flooding and sprinkler 60 head	794	Riparian	---	About 1880	Gravity; collection system diverts water from numerous springs to Dillon Ditch which also receives water from 195/30E-19C1.	Former owners: George Dillon, Lloyd Kather. Normally used in conjunction with 195/30E-19C1 which was washed out in 1955 and not replaced until 1958.

* - One acre-foot.
** - For additional information see Appendix E, "Detailed Descriptions of Certain Surface Water Diversions."
For lettered footnotes, see last page of table.

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Location number and/or Plot 2 sheet number	Diversion name and/or owner	Source	Water use April 1957 - March 1958		Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted acre-feet	Type	Amount			
North Fork Subunit (Continued)										
M. D. B. & H.										
198/29E-24N1 (Sheet 1)	Flagg-Cole Ditch W. A. McCulloch	North Fork Tule River	Irrig. Stock.	(*) --	Approp.	--	--	About 1860	Gravity; concrete dam 6 feet high, 15 feet long, with 0.9 mile of earth ditch.	Former owners: James Flagg, Frank Flagg, P. Flagg, Roberts, Walter Strute, Brown, Helman Blank of Los Angeles. Details of use and amount diverted reported under 198/29E-23M1.
198/29E-25N1 (Sheet 1)	Arthur O. Griswold	Springs and unnamed tributary to North Fork Tule River	Irrig. Stock.	Not meas.	Adjud.	30 MI	Par. 8c	1888	Gravity; small concrete diversion structure with 0.5 mile of pipe.	Former owners: Joe Street, F. C. Meddick.
198/29E-26N1 (Sheet 1)	Roy K. Cole	Kramer Creek	Irrig. Stock.	8 acres by flooding 80 head	Riparian	--	--	About 1900	Gravity; rock dam about 2 feet high with 0.9 mile of earth ditch.	Former owners: Flagg, Leo, Douglas Osborne.
198/29E-26F1 (Sheet 1)	Bryan and Mildred Jones	Tributary to North Fork Tule River	Irrig. Stock. Domestic (p)	9 acres by sprinkler 400 head	Approp.	45 af storage	A-15289b	1953	Storage and pump; earth dam 25 feet high, 450 feet long, 65-acre-foot reservoir, with 5-hp pump, pipeline, and 3-acre-foot secondary reservoir.	Reported amount diverted is that pumped from reservoir. In addition a large portion of stored water was used for stockwatering and lost by evaporation and seepage. Reservoir filled in May 1957 and was full again in March 1958.
198/29E-26G1 (Sheet 1)	Ralph B. Urmy	Kramer Creek	Irrig.	4 acres by flooding	Riparian	--	--	About 1870	Gravity; rock and earth dam with 0.7 mile of earth ditch.	Former owners: Short, Murphy, Federal Land Bank, A. G. Plumb.
198/29E-25L1 (Sheet 1)	Brundage Ditch Roy Corzine W. C. Hart A. O'Connor	North Fork Tule River	Irrig. Stock.	46 acres by flooding and sprinkler* 60 head	Adjud.	2.75 cfs 2.75 cfs	Par. VIIIb Par. 21c	About 1900	Gravity; rock dam 2 feet high, 20 feet long, with 1.3 miles of earth ditch.	Former owner: T. J. Brundage. Amount diverted used to irrigate 34 acres jointly with 198/30E-18d in addition to the reported area irrigated.
198/29E-25N1 (Sheet 1)	Almsworth Ditch A. O. Griswold	North Fork Tule River	Irrig. Stock.	13 acres by flooding 30 head	Adjud.	1.0 cfs	Par. 21c	About 1900	Gravity; rock dam with 0.2 mile of pipeline and earth ditch.	Former owner: M. P. Palmer.
198/30E-17G1 (Sheet 1)	Clyde Osborn	North Fork Tule River	Irrig. Domestic (p)	21 acres by flooding	Riparian	--	--	About 1880	Gravity; concrete dam 3 feet high, 20 feet long, with 0.5 mile of 8-inch pipe and 0.2 mile of earth ditch.	Former owners: A. P. Dillon, Stewart, Osborn, Beama.
198/30E-17N1 (Sheet 1)	Dawson Miller	North Fork Tule River	Irrig. Poultry Domestic (p)	14 acres by flooding 11,000 turkeys	Approp.	--	--	1889	Gravity; concrete dam 4 feet high, 30 feet long, with 0.6 mile of 8- and 10-inch pipe.	Former owner: Charles G. Greig.
198/30E-18L1 (Sheet 1)	Carl Walters	North Fork Tule River	Irrig. Domestic (p) Stock.	10 acres by sprinkler 20 head	Riparian	--	--	1947	Pump; 1.5-hp electric motor with 400 feet of 3-inch pipe to 19,000-gallon tank.	Reported amount diverted is total for April - December 1957 only.

* - See remarks.

** - For additional information see Appendix C, "Detailed Descriptions of Certain Surface Water Diversions." For lettered footnotes, see last page of table.

TABLE 3 (Continued)

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Location number and Plot 2 sheet number	Diversion name and/or owner	Source	Water use April 1957 - March 1958		Amount diverted acre-feet	Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use		Type	Amount	Reference			
<u>M.D.B. & M.</u>											
205/29E-301 (Sheet 2)	James Evending*	Tributary to North Fork Tule River	(*)	(*)	None	(q)	--	--	Prior 1952	Gravity and storage; earth dam, 17-acre-foot reservoir.	Ownership changed to Valmer K. McElmin June 1958. Applicant's 19615 ⁹ filed by Valmin for irrigation of 67 acres. Not used in 1957.
205/29E-301 (Sheet 2)	Norman B. and Cora M. Harris	Tributary to North Fork Tule River	(*)	No record	--	(q)	--	--	1955	Gravity and storage; earth dam, 46-acre-foot reservoir with pipeline to sprinkler.	Application 16666 ⁹ filed for irrigation of 20 acres and for stockwatering.
205/29E-101H (Sheet 1)	Holand R. Killian	Tributary to North Fork Tule River	(*)	(*)	None	(q)	--	--	1955	Gravity and storage; earth dam, 30-acre-foot reservoir.	Application 16704 ⁹ for 205/29E-101H and -101I filed for irrigation of 20 acres and for stockwatering. Not used in 1957.
205/29E-101I (Sheet 2)	Holand R. Killian	Tributary to North Fork Tule River	(*)	(*)	None	(*)	--	--	1955	Gravity; earth dam and conduit to reservoir of 205/29E-101H.	Combined with 265/29E-101I in Application 16704 ⁹ .
205/29E-101J (Sheet 2)	Ph. Fish Ditch Earl D. Kinyon	North Fork Tule River	Irrig. Stock.	% acres by flooding. ⁹ 250 head	698	Adjud.	170 MI ¹⁰	Par. 6, 20c	About 1860	Gravity; rock and sandbag dam with 0.7 mile of earth ditch.	Former owners: Phyllis, John McKiearnan, J. K. Kramer, E. D. Kinyon, W. A. McLagan, W. R. Carrothers, W. F. Ewer. Area irrigated received supplemental supply from ground water. Apparent water right claim includes 50 MI adjudicated to W. F. Ewer in Par. 20, Case No. 7004.
205/29E-131H (Sheet 2)	Ed Eames	Bear Creek	Irrig. Stock.	7 acres by flooding	78	Riparian	--	--	1874	Gravity; wood dam with 0.3 mile of earth ditch.	Former owners: Gus Millenhouse, Sherman, R. Gilbert, Wes Green.
205/29E-131P (Sheet 1)	Ed Eames	Bear Creek	Irrig. Stock.	12 acres by flooding	76	Riparian	--	--	1874	Gravity; rock and mortar dam with 0.5 mile of earth ditch, flume and pipe.	Former owners: Gus Millenhouse, Sherman, R. Gilbert, Wes Green.
205/29E-141J (Sheet 2)	Clemmie Gill	Hickman Creek	Irrig. Stock.	16 acres by flooding 250 head	137	Riparian	--	--	1859	Gravity; concrete dam 2 feet high, 10 feet long, with 0.3 mile of earth ditch.	Former owners: Gill, Williams, Kincaid.
205/29E-301I (Sheet 2)	F. C. Neas	North Fork Tule River	Irrig. Stock.	60 acres by flooding 100 head	641	Adjud.	2.0 cfs	Par. 25c	1874	Gravity; rock dam with 1 mile of earth ditch.	Former owners: Charles Lumbo, Clements, Telford, C. E. Nevas.
205/29E-301J (Sheet 1)	John E. Bace	Springs tributary to Bear Creek	Irrig. Domestic	17 acres by sprinkler (p)	Not meas.	Approp. Approp.	0.138 cfs 2 at storage	A-9961b A-12600b	1876	Gravity and pump from springs adjacent to area of use.	Former owner: Harper.
205/29E-301I (Sheet 1)	Henry Jett-Luff	Bear Creek	Irrig.	7 acres by sprinkler	Not meas.	Approp.	0.08 cfs A-13499b 0.02 cfs A-14683b	A-6880b	1931	Gravity; earth dam 1 foot high, 12 feet long, with 0.5 mile of 4-inch pipe.	Former owner: J. H. Garner.

* - See Remarks.

** - For additional information see Appendix 2, "Detailed Descriptions of Certain Surface Water Diversions."

For lettered footnotes, see last page of table.

TABLE 3 (Continued)

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Location number and/or Plate 2 sheet number	Diversion name and/or owner	Source	Water use April 1957 - March 1958		Apparent water right		Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted (acre-feet)	Type			
15/25-481 (Sheet 3)	William C. Berry	Springs tributary to Bear Creek	Irrig.	13 acres by furrow	Not meas.	(n)	---	Storage and gravity; earth dam 40 feet high, 250 feet long at 1 1/2-acre-foot reservoir, with 0.2 mile of 1.5-inch pipe, and supplemental collection system of 3-inch and 1.5-inch pipe from two nearby springs.	Former owner: Planchon.
15/25-481 (Sheet 3)	W. J. Cox Estate, et al.	Tule River	Irrig. Domestic	31 acres by flooding (p)	708	Adjud. Adjud.	Par. VIII ^d Par. 3 ^c	Gravity; concrete dam 3 feet high, 150 feet long, with 1.9 miles of earth ditch.	Former owners: O. A. Wilcox, H. A. Wilcox, William G. Hooper, L. O. Brough, Sarah E. McFarland. The lands irrigated by this diversion are within the high-water line of Success Reservoir now under construction.
15/25-481 (Sheet 3) (Export)	Pioneer Ditch; Pioneer Water Company	Tule River	Export*	(*)	5,685	Adjud.	Par. VIII ^d	Gravity; concrete dam 8 feet high, 50 feet long, with earth ditch to Porterville area.	Former owner: Pioneer Land Company. Water exported outside of Tule River Hydrographic Unit for use in Porterville area.
15/25-481 (Sheet 3)	Hugh T. Gordon	Tributary to Campbell Creek*	(*)	(*)	None	(q)	---	Gravity and storage; earth dam 20 feet high, 450 feet long, with 47.5-acre-foot reservoir, 10-hp pump to sprinklers.	Reservoir also receives water from Pleasant Valley Ditch (15/25-481). Application 10/17/58 filed for irrigation of 43.4 acres. Used only to store water from Pleasant Valley Ditch in 1957. Dam installed in 1958.
215/25-481 (Sheet 3)	Crabtree-Akin Ditch; J. J. Hunsy; John C. Moore; Walter Mitt	Tule River	Irrig. Stock.	1/1 acres by flooding and sprinkler; Fishing ponds	896*	Adjud. Adjud. Adjud.	Par. VIII ^d Par. XIII ^d Par. 17 ^c Par. 10 ^a	Gravity; rock dam with 3.0 miles of earth ditch.	Former owners: A. P. Osborn, H. W. Halburton, H. W. Crabtree, S. R. Mathewson, W. F. Wecker, C. H. Jones, M. F. Slayden, W. E. Crabtree, James A. Akin, Emma Akin. Amount diverted used to irrigate 66 acres jointly with 215/25-481 (Springsville Subunit), in addition to the reported area irrigated. In addition to the reported amount diverted an estimated 225 acre-feet of runoff and return flow entered ditch below measuring point.
15/25-481 (Sheet 3)	Clement-Bauer Ditch; W. W. Reinhardt	Tule River	Irrig. Stock.	1/4 acres by furrow and sprinkler	260*	Adjud. Adjud.	Par. XIII ^d Par. 16 ^c	Gravity; wood dam with 1.4 miles of earth ditch.	Former owners: A. P. Osborn, C. S. Clement, Elan Manier. Of the amount diverted 104 acre-feet were used by K. L. McClellan. Ralph Wardlaw and Leland Crook also normally irrigate from the ditch, but did not do so in period reported.

* - See Appendix.

** - For additional information see Appendix. *Detailed descriptions of Certain Surface Water Diversions. For lettered footnotes, see last page of table.

TABLE 3 (Continued)

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Location number and/or Plate 2 sheet number	Diversion name and/or owner	Source	Water use April 1957 - March 1958		Apparent water right		Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type			
M D B & H									
21S/29E-15N2 (Sheet 3)	Walter A. Mitt	Tributary to Tule River*	(*)	(*)	None	--	1955	Gravity and storage; earth dam, 30-acre-foot reservoir.	Reservoir also receives water from Graham-born Ditch (21S/29E-22N) and Crutcher-Main Ditch (21S/29E-14N1). Reservoir stocked with fish. Application 1/24/57 filed for irrigation of 42 acres. Not used in 1957.
21S/29E-17N1 (Sheet 3)	Vincent Ditch William J. Aston Garland Country Norman D. Roberts	Tule River	Irrig. Stock.	117 acres by flooding and sprinkler	1,013	Adjud.	1869	Gravity; concrete dam about 2 feet high, 25 feet long, with 2.5 miles of earth ditch.	Former owners: George H. B. Vincent, Sena Wallace, E. F. Wallace, Frank Harkley, Badgeral, C. H. Smithing, Todd, C. J. Byers. Portion of the lands irrigated by this diversion are within the high-water line of Success Reservoir now under construction.
21S/29E-18N1 (Sheet 3)	Hose Ditch Arthur Wardlaw	Tule River	Irrig. Stock.	101 acres by flooding	2,360	Adjud.	1873	Gravity; concrete dam with 1.5 miles of earth ditch.	Former owners: Ross, John Moore, Marksbury, Ann B. Wardlaw, James Wardlaw. Portion of the lands irrigated by this diversion are within the high-water line of Success Reservoir now under construction.
21S/29E-19N1 (Sheet 3)	Foot's Ditch Doris Krusche Arthur Wardlaw	Tule River	Irrig. Stock.	23 acres by flooding	966	Adjud.	1871	Gravity; polyethylene-covered rubble dam with 0.4 mile of earth ditch.	Former owners: Foote, W. H. Truener, Anna B. Wardlaw, James Wardlaw. The lands irrigated by this diversion are within the high-water line of Success Reservoir now under construction.
21S/29E-21N1 (Sheet 3)	J. J. Hanzel	Graham Creek	Stock. Recr.	Fishing in reservoir	30	(n)	1947	Gravity and storage; dam with 0.5 mile of earth ditch to 45-acre-foot reservoir.	
22S/29E-12N1 (Sheet 4)	Agency Ditch Tule River Indian Reservation	South Fork Tule River	Domestic Irrig.	Scattered small pastures	Not meas.	Adjud.	1890	Gravity; rubble masonry dam 4 feet high, 40 feet long, with 0.8 mile concrete-lined ditch.	(**)
22S/29E-14N1 (Sheet 4)	South Tule Ditch; South Tule Independent Ditch Company	South Fork Tule River	Irrig. Stock.	(*)	(*)	(*)	1896	Gravity; concrete dam 3 feet high, 25 feet long, with 0.8 mile of 12-inch pipe to junction with ditch from 22S/29E-15N1 (South Fork Subunit).	Amount diverted, details of use, and water right data reported under 22S/29E-15N1 (South Fork Subunit). **

* - See remarks.

** - For additional information see Appendix C, "Detailed Descriptions of Certain Surface Water Diversions." For lettered footnotes, see last page of table.

TABLE 3 (Continued)

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN TULE RIVER HYDROGRAPHIC UNIT

Location number and sheet number	Diversion name and/or owner	Source	Water use April 1957 - March 1958		Apparent water right			Indicated date of operation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount			
11-72-11 (Sheet 1)	W. J. D. Hill Charles T. Hill Hilton	South Fork Tule River	Irrig. Stock, Domestic (p)	7 acres by flooding*	335*	Adjud.	3,421 cfs Par. VIII d	Gravity; rock and sandbar dam with 1.1 miles of earth ditch.	Former owners: Sardinia, Alford, Hilcox. Diversion and irrigation terminated in June 1957 when ditch was severed by relocation of State Highway 190. The lands irrigated by this diversion are within the high-water line of Success Reservoir now under construction.	
11-72-11 (Sheet 1)	W. J. D. Hill Charles T. Hill Hilton	South Fork Tule River	Irrig. Stock, Domestic (p)	7 acres by flooding*	106*	Adjud.	(n) Par. 13c	Gravity; concrete dam 3 feet high, 80 feet long, with 0.2 mile of earth ditch.	Diversion formerly known as Crabtree and Bolden Ditch. Former owners: Miller, Bolden, Crabtree, J. P. Fynn, A. J. Wain, Claude Dunham. Amount diverted used to irrigate 100 acres jointly with 223/246-44DI and 225/246-501 in addition to the reported area irrigated.	
11-72-11 (Sheet 1)	W. J. D. Hill Charles T. Hill Hilton	South Fork Tule River	Irrig. Stock, Domestic (p)	17 acres by flooding	431	Adjud.	(l) Par. 9c	Gravity; rock dam with 1.1 mile of earth ditch.	Former owners: Hilton, Henderson, Henry M. King, William King.	
11-72-11 (Sheet 1)	W. J. D. Hill Charles T. Hill Hilton	South Fork Tule River	Irrig. Stock, Domestic (p)	9 1/2 acres by flooding and furrow*	2,670*	Adjud.	6 cfs Par. VIII d Par. 12c	Gravity; concrete dam 3 feet high, 50 feet long, with 10.3 miles of earth and concrete-lined ditch.	Reported amount diverted includes all water diverted by 223/246-44DI (See previous Subunit). Considered supply used or irrigated 100 acres jointly with 223/246-501 in addition to reported area irrigated.	

* - See page 11.
** - For additional information see Appendix, "Description of Certain Surface Water Diversions."
p. 11 and 12, pages 109 and 110, page 111.

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Footnotes

- a - Tulare County Records.
- b - Refers to applications to appropriate water filed with State Water Rights Board.
- c - Poplar Irrigation Company v. Howard, No. 7004, Tulare County Superior Court, September 11, 1916.
For additional information concerning this case, see Appendix D.
- d - Glover v. Mitchell, No. 5480, Tulare County Superior Court, May 9, 1910. Stated amount of apparent water right claim referenced by Paragraph XIII is for diversion during the 22-day period March 19 to April 10 each year for domestic purposes and to irrigate gardens only. The amount referenced by Paragraph VIII is for diversion during the remainder of each year. For additional information concerning this case, see Appendix D.
- e - Jones v. Pleasant Valley Canal Company, No. 18018, Tulare County Superior Court, July 31, 1933.
For additional information concerning this case, see Appendix D.
- f - Reported adjudicated water rights are not additive; see section of Appendix D on "Mitigation Concerning Local Water Rights".
- g - Paragraph 16, Poplar Irrigation Company v. Howard, supra, entitles the owners of the Clement-Manier Ditch to divert from Tule River not in excess of 5.0 cfs for power and to use cumulatively 2.0 cfs of the amount diverted when the flow in the river exceeds 80 cfs at the head of Porter Slough but, to use cumulatively only 1.25 cfs when the flow is less than 80 cfs. (This diversion is no longer used to generate power.)
- h - Paragraph 4, Poplar Irrigation Company v. Howard, supra, entitles the owners of Foote Ditch to divert from Tule River 85 MI (1.7 cfs) at all times and an additional 45 MI, for a total of 130 MI (2.6 cfs), when: (1) the flow in the river exceeds 114½ cfs at the head of the Pioneer Ditch, or (2) the flow in the river at head of Porter Slough exceeds 80 cfs, and the flow in Pioneer Ditch does not exceed 27½ cfs, and the flow in Campbell and Moreland Ditch does not exceed 7 cfs.
- i - Paragraph 9, Poplar Irrigation Company v. Howard, supra, entitles the owners of King Ditch to divert 25 MI (0.5 cfs) from South Fork Tule River when there is 15 cfs or less flowing in the South Fork above the head of South Tule Ditch (225/29E-15C1), or 1.5 cfs when the flow exceeds 15 cfs.
- j - Paragraph 12, Poplar Irrigation Company v. Howard, supra, entitles the owners of South Tule Ditch to divert 5 cfs from South Fork Tule River when the flow in Tule River at the head of Porter Slough is 100 cfs or less, 10 cfs when the flow is 100 to 500 cfs, and an unlimited amount when the flow exceeds 500 cfs.
- k - Paragraph 3, Poplar Irrigation Company v. Howard, supra, entitles the owners of the Wilcox Ditch to divert from Tule River 6.5 cfs on 20 days of each month, but limits the diversion to 25 MI (0.5 cfs) for the remaining days.
- m - Paragraph 13, Poplar Irrigation Company v. Howard, supra, entitles the owners of Miles Ditch to divert for use 2.5 cfs from South Fork Tule River for 14 days of any 30-day period.
- n - Insufficient information to determine type of water right.
- p - Domestic use by less than 5 families or connections.
- q - The appropriate application for this diversion, pending at the time of this survey, was denied by the State Water Rights Board on June 30, 1961.

Records of Surface Water Diversions

Periodic or continuous measurements of surface water diversions were made by the Department of Water Resources during portions of 1957 and 1958 wherever it was feasible to measure the flows. Most of the diversions for nonagricultural uses, and some of those used for agriculture, were operated throughout the year. Substantially all diversion measurements were started by April 1957, prior to the commencement of intensive irrigation, and the measurements were continued through March 1958 in order to obtain a complete season's record. The measurements were classed as estimates when data were incomplete or uncertain. A few diversions were located at a late stage in the survey but no measurements or estimates of these were attempted. Results of the measurement program are summarized in Table 4. When feasible, measurements of each diversion were made at a location above the area of first use as close to the diversion intake as possible, but below any regulatory spill. Exceptions are noted in the table.

The measured quantity of water diverted totalled some 77,000 acre-feet, distributed as follows: 47,100 acre-feet for power production; 23,100 acre-feet for irrigation and stockwatering; 322 acre-feet for urban uses; 150 acre-feet for domestic supply at a resort; 700 acre-feet for operation of a fish hatchery; and 5,680 acre-feet exported from the unit via Pioneer Ditch.

Determinations of diverted quantities were made primarily by measurement of open channel flow and testing of pumps. Periodic current meter measurements of open channel flow were made during the diversion season to obtain channel ratings. Water surface stage was recorded either by weekly observations of staff gage or with continuous water-stage recorder, from which quantities of flow were calculated. Existing weirs were used whenever available. These observations were supplemented by readings taken by water users and interviews were held to determine possible abrupt changes in operation between readings.

Seasonal totals in Table 4 are based on various methods listed in the column "Method of Observation and Calculations". The data, however, were sometimes not sufficiently detailed to justify a breakdown into monthly values. These cases are indicated by dashes. Where the monthly data were sufficiently reliable, monthly values are shown. When the diversion for a given period is known to have been zero, it is so indicated. Notations regarding extent of irrigation period indicate the overall period of irrigation, but not necessarily that daily or continuous irrigation was practiced throughout the period. Notations that a stream source was dry at a certain time indicate that the source was essentially dry, in that stream flow was so low as to make diversion infeasible.

Index to Surface Water Diversions

For convenience of the reader, an alphabetical index of diversion owners and diversion names, along with the subunit location of each diversion and reference to maps and page numbers on which data concerning each appear, is shown in Table 6, which appears at the end of this chapter.

Imports and Exports

There are no surface water supplies imported to Tule River Hydrographic Unit from areas outside the unit. There may be a small net export or import to the irrigated land supplied by ground water in the Success Subunit in Frazier Valley, as shown on Sheet 3 of Plate 2. The owner of these lands irrigates lands which lie both inside and outside the unit with ground water obtained from wells located on both sides of the boundary.

The only significant export from the unit is that made by the Pioneer Water Company, which diverts water at location 21S/28E-26Q1 through Pioneer Ditch, as described in Table 3 and in Appendix C. Use of water from this diversion is made entirely outside the unit in the vicinity of Porterville. In addition, about eight acres of land which were irrigated by water from Wilcox (South Fork) Ditch in 1957 lie just outside the unit. This land is now within the construction area of Success Dam and Reservoir.

TABLE 4

MONTHLY RECORDS OF SURFACE WATER DIVERSIONS
TULE RIVER HYDROGRAPHIC UNIT
April 1957 - March 1958

Location Number	Diversion name or owner	Use	Point of measurement or estimate	Method of observation and calculation	Amount diverted, in acre-feet												Remarks	
					1957													
					Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar		Total
Middle Fork Subunit																		
208/210-211	Water use for irrigation	Irrigation	At intake	Depth-flow relationship and water-stage recorder	210	230	220	2070	1610	1000	1650	1850	221	0	0	0	2190	Reported amounts include diversions from the two low-rain points indicated. Also included is an unmeasured release from conduit at 5/1/57 - 6/1/57 - 6/2/57/57. Source dry 7/14/57 - 9/15/57.
208/210-212	Tule River Powerhouse Conduit (Pacific Gas and Electric Company)	Power	U.S. Gas station, P. G. & E. Company's Conduit near Springville, 0.5 mile below intake	Depth-flow relationship and water-stage recorder	2710	4090	3560	1560	1020	835	952	988	1250	1370	2090	3080	23,500*	Reported amounts for use diversions from the three diversion points indicated.
208/210-213	Camp Nelson Water Company	Domestic and recreation only	At storage tank above area of spill	Estimated	0	0	0	0	0	0	0	0	0	0	0	0	150	
208/210-214	Camp Nelson Resort	Irrigation and stockwatering, May-November only	Below point of release of spill from 2/8/57-2/11	Estimated	0	0	0	0	0	0	0	0	0	0	0	0	60	
208/210-215	Woodhouse Ferry Fish Hatchery	Fish hatchery	At intake	Estimated	0	0	0	0	0	0	0	0	0	0	0	0	700	
Springville Subunit																		
208/205-2121	Akin Ditch	Irrigation for period 5/2/57 - 11/25/57 and stockwatering	0.5 mile below intake	Depth-flow relationship and staff gage	0	36	33	37	37	27	28	30	25	24	12	0	289	
208/205-2122	Washburn Ditch	Irrigation for period 5/1/57 - 11/27/57 and stockwatering	0.4 mile below intake	Depth-flow relationship and staff gage	0	66	52	41	38	64	58	25	0	0	0	0	344	Reported diversion total is for period of irrigation 5/1/57 - 11/27/57 only.
208/205-2123	Long Canyon Ditch	Irrigation for period 6/1/57 - 11/15/57	At area of use	Depth-flow relationship and staff gage	13	6	12	1	0	0	4	2	0	0	0	0	38	Diversion out for repair 5/1/57 - 6/8/57 and 6/14/57 - 6/22/57. Source dry 7/14/57 - 9/15/57.
213/295-211	Mr. Whitney Ditch	Irrigation, industrial, stockwatering, domestic	0.2 mile below intake	Depth-flow relationship and water-stage recorder	122	160	172	192	227	227	179	63	28	50	26	19	1,448*	Regulatory spill downstream from point of measurement was estimated and deducted from measured quantities and the difference reported thereon. Total estimated spill is 113 acre-feet.
213/295-271	Walker Ditch	Irrigation for period 5/15/57 - 11/14/57 and stockwatering	500 feet below intake	Depth-flow relationship and staff gage	14	42	28	32	33	28	33	17	0	0	0	0	227	
213/295-272	Frank K. Kibler	Irrigation for period 4/1/57 - 10/28/57 and stockwatering	At pump	Pump test and power records	1	1	5	6	6	5	1	0	0	0	0	0	25	
213/295-211	Whitcomb-Ditch	Irrigation, recreation, stockwatering	0.2 mile below intake	Depth-flow relationship and water-stage recorder	284*	318	355	381	368	253	219	188	80	41	22	30	2,529*	Amount reported for April is for period 4/10/57 - 4/30/57 only.
213/295-1111	Pleasant Valley Ditch	Irrigation, stockwatering	0.3 mile below intake	Depth-flow relationship and water-stage recorder	172	172	395	443	429	331	334	151	87	77	70	94	2,755*	Regulatory spill downstream from point of measurement was estimated and deducted from measured quantities and the difference reported thereon. Total estimated spill is 184 acre-feet.

* - See remarks
** - Estimated
- - Monthly value unknown

TABLE 4 (Continued)
MONTHLY RECORDS OF SURFACE WATER DIVERSIONS
TULE RIVER HYDROGRAPHIC UNIT
April 1957 - March 1958

Cont. Number	Diversion name or owner	Use	Point of measurement or estimate	Method of observation and calculation	Amount diverted, in acre-feet												Remarks	
					1957													
					Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Total	
Springville Subunit (continued)																		
215/29E-1111	Walter M. Meib and Claude A. Bouch	Irrigation at Okawville, recreation	At electric pump	Pump test and power records	0	5	6	22	27	24	9	0	0	0	0	0	93*	Additional underrun and amount pumped by waterwheel-powered pump.
215/29E-001	Duane Ditch	Irrigation for period 9/30/57 and stockwatering	0.3 mile below intake from Tule Powerhouse tailrace	Depth-flow relationship and staff gage	-	-	-	248	243	205	10	8	9**	9**	8**	20	760*	Reported diversion total is for period 7/1/57 - 3/31/58 only.
193/29E-001	Springville Pile	Municipal	At treatment plants	Water records	11*	21*	59*	81*	70	45	11	7	6*	3	3*	2*	322*	Amount for April - July and September - March partially estimated.
North Fork Subunit																		
193/29E-001	Flag-Cole Ditch	Irrigation for period 4/1/57 - 8/24/57, and stockwatering	3/4 mile below -20KI, 0.6 mile below -20KI	Depth-flow relationship and staff gage	25	2	17	25	3	0	0	0	0	0	0	0	72	Other than 1957-58, all water diverted from this source created by flow in upper reaches of Tule River. Source ceased to flow in March 1958.
193/29E-001	Dillon Ditch (Springs)	Irrigation for period 3/1/57 - 10/18/57, and stockwatering	0.2 mile below intake	Katadict and staff gage	55*	79*	92*	70**	41	27	35	63	73**	78**	41*	105**	794	
193/29E-001	Boy E. Cole	Irrigation for period 4/22/57 - 7/25/57, and stockwatering	At area of use 0.6 mile below intake	Staff gage	5*	9	6	6	0	0	0	0	0	0	0	0	26	Source ceased to flow 7/20/57.
193/29E-001	Bryan and Mildred Jones	Irrigation, stockwatering, domestic	At pump from reservoir	Katadict	0	0	1*	2*	2*	0	0	0	0	0	0	0	5*	Reported amount diverted is that pumped from reservoir. In addition a large portion of stored water was lost by evaporation and seepage. Reservoir filled with water in March 1958. Source ceased to flow in March 1958.
193/29E-001	Walsh B. Umy	Irrigation for period 3/31/57 - 6/30/57	0.4 mile below intake	Depth-flow relationship and staff gage	6	6	5	0	0	0	0	0	0	0	0	0	17	Source ceased to flow 6/30/57.
193/29E-001	Brundage Ditch	Irrigation, stockwatering	0.3 mile below intake	Depth-flow relationship and staff gage	108	103	93	33	4	0	0	0	2**	7**	5**	54**	624	
193/29E-001	Almworth Ditch	Irrigation for period 6/20/57 - 10/1/57, and stockwatering	0.2 mile below intake	Depth-flow relationship and staff gage	0	0	6	5	6	7	5	0	0	0	0	0	29	
193/29E-001	Clyde Caborn	Irrigation for period 4/2/57 - 11/2/57, and domestic	At area of use 500 feet below intake	Depth-flow relationship and staff gage	21	22	21	22	22	21	22	21	22	22	20	22	258	
193/29E-001	Dawson Miller	Irrigation for period 2/15/57 - 10/15/57, poultry watering, domestic	Wear pipe terminal	Depth-flow relationship and staff gage	18**	18**	17	9	6	2	4	3	5**	8**	6**	6**	100	Three domestic users ascertained, two of which are above point of measurement.
193/29E-001	Carl Sellers	Irrigation, domestic, stockwatering	At pump	Pump test and source flow operation	0	0	3	6	8	2	0	0	0	-	-	-	19*	Reported diversion total for April - December 1957 only.
193/29E-001	Derrinton Ditch	Irrigation, stockwatering	At intake	Depth-flow relationship and staff gage	-	12**	132	170	56	42	64	172	83	43	10	0	764*	Reported diversion total for May 1957 - March 1958 only.

* See remarks
** Estimated
- Monthly value unknown

MONTHLY RECORDS OF SURFACE WATER DIVERSIONS
TULE RIVER HYDROGRAPHIC UNIT
April 1957 - March 1958

Location number	Diversion name or owner	Use	Point of measurement or estimate	Method of observation and calculation	Amount diverted, in acre-feet												Total	Remarks
					1957													
					Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar		
<u>North Fork Subunit (continued)</u>																		
193/208-3211	Gilbert Millin	Irrigation for period 4/1/57 - 10/9/57	0.2 mile below intake	Depth-flow relationship and staff gage	11	7	25	21	19	5	1	0	0	0	0	0	89*	Regulatory spill downstream from 7/15/57 to 8/19/57. Estimated and deducted from measured quantities and the difference reported herein. Total estimated spill is 31 acre-feet. Source dry 7/15/57 - 11/3/57.
203/208-271	Bailey Ditch	Irrigation for period 1/2/57 - 1/15/57 and stockwatering	0.4 mile below intake	Depth-flow relationship and staff gage	85	65	89	17	0	0	0	3	2	1	1	0	263	
203/208-1111	Pharis Ditch	Irrigation for period 1/1/57 - 3/31/58 except when source dry and stockwatering	0.4 mile below intake	Depth-flow relationship and staff gage	72	97	95	14	0	0	6	51	50	70	101	142	698	Source dry 7/26/57 - 10/15/57.
203/208-1371	Ed Essee	Irrigation for period 4/1/57 - 8/19/57 and stockwatering*	At area of use	Depth-flow relationship and staff gage	20	21	20	16	1	0	0	0	0	0	0	0	78	Beas Creek ceased to flow 8/19/57.
203/208-1372	Ed Essee	Irrigation for period 4/1/57 - 8/19/57 and stockwatering	At area of use	Depth-flow relationship and staff gage	20	21	20	12	3	0	0	0	0	0	0	0	76	Beas Creek ceased to flow 8/19/57.
203/208-1411	Clemmie Gill	Irrigation in January, 1957 and for period 4/10/57 - 12/12/57 and stockwatering	At area of use	Depth-flow relationship and staff gage	20	26	15	1	2	3	4	11	10	6	15	24	137	
203/208-2310	F. C. Nequa	Irrigation for period 4/8/57 - 7/28/57 and stockwatering*	Near intake	Depth-flow relationship and staff gage	165	227	199	50	0	0	0	0	0	0	0	0	641	Source ceased to flow 7/29/57.
<u>Success Subunit</u>																		
215/258-2171	Allison Ditch	Irrigation (approximately one-third of time) for period 5/23/57 - 10/6/57, and domestic	0.2 mile below intake	Depth-flow relationship and staff gage	78	81	47	78	38	29	57	55	57	57	63	68	708	
215/258-2611	Pioneer Ditch	Export	0.8 mile below intake	Depth-flow relationship and water-stage recorder	803	947	998	447	0	30	254	234	217	607	692	456	5,685	Water is exported from Tule River Hydrographic Unit.
215/208-1481	Crabtree-McIn Ditch	Irrigation prior to 4/1/57 to about 11/20/57, recreation, stockwatering	Near Intake	Depth-flow relationship and staff gage	125	111	114	152	117	10	50	83	44	23	9	0	896*	In addition to diversion amount reported, an estimated 25 acre-feet of runoff and return flow entered ditch 1 1/2 feet below measuring point.
215/208-1391	Clement-Meiler Ditch	Irrigation for period 4/9/57 - 10/15/57, and stockwatering	At each of three delivery pumps from ditch	Pump tests, power records, and hours of operation	11	23	51	56	51	44	24	0	0	0	0	0	260	
215/208-1701	Vincet Ditch	Irrigation, stockwatering	0.2 mile below intake	Depth-flow relationship and staff gage	38	40	36	46	47	45	74	101	135	179	151	119	1,013	
215/208-1811	Hens Ditch	Irrigation for period 3/10/57 - 11/28/57 and stockwatering	Near Intake	Depth-flow relationship and staff gage	265	451	342	332	212	219	261	207	1	9	19	42	2,340	

* See remarks
** Estimated
- Monthly value unknown

TABLE 4 (Continued)

MONTHLY RECORDS OF SURFACE WATER DIVERSIONS
TULE RIVER HYDROGRAPHIC UNIT
April 1957 - March 1958

Local number	Divers or owner	Use	Point of measurement or estimate	Method of observation and collection	Amount diverted, in acre feet												Remarks	
					Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar		Total
<u>Success Subunit (continued)</u>																		
218/76-1021	Yoste Ditch	Irrigation for period 7/1/57 - 11/29/57 and stockwatering	Near intake	Depth-flow relationship and staff gage	11.0	21.6	15.0	16.7	7.2	7.6	7.2	7.3	0	0	0	0	96.6	
213/76-1021	J. J. Menged	Stockwatering, recreation	at reservoir	Estimated from change in storage	-	-	-	-	-	-	-	-	-	-	-	-	3.0	
<u>Reservation Subunit</u>																		
<u>South Fork Subunit</u>																		
213/76-1021	Wilcox (South Fork) Ditch	Irrigation	500 feet below intake	Depth-flow relationship and staff gage	1.23	13.2	8.0*	0	0	0	0	0	0	0	0	0	33.5	See Diversion 223/76-1021 (South F. #4 subunit)
213/76-1021	Blake Ditch	Irrigation for period March, 1957 - 11/22/57 (except when flow at source was very low), and stockwatering	At area of use	Depth-flow relationship and staff gage	-	-	5.7	2.2	0	0	0	2.6	0	0	0	0	10.5*	Diversion amount reported is for period June, 1957 - March, 1958 only and includes undetermined amount of spill returned to South Fork Tule Ditch. See Diversion 223/76-1021. 13 Gate No. 7006. Flow in source because very low 7/17/57
223/76-1021	Flung Ditch	Irrigation, stockwatering, domestic	At area of use	Depth-flow relationship and staff gage	5.8**	5.1**	6.6	5.1	2.9	2.2	3.5	4.2	3.1**	4.3**	1.5**	7	4.31	Diversion ceased 4/21/57 when ditch was severed by highway relocation.
223/76-1021	South Tule Ditch	Irrigation, stockwatering	0.2 mile below -1501 intake	Depth-flow relationship and water-stage recorder	2.08	3.34	4.64	4.42	3.16	2.85	2.86	1.15	6.2	8.7	5.1	4.0	2,670*	Diversion amount reported is for period June, 1957 - March, 1958 only and includes undetermined amount of spill returned to South Fork Tule Ditch. See Diversion 223/76-1021. 13 Gate No. 7006. Flow in source because very low 7/17/57. Reported amounts represent total diversions from the two points indicated, and include 78 acre-feet released 0.2 mile below source of Flung Ditch during period 7/19/57 - 10/8/57 for diversion at Blake Ditch (223/76-1021).

* See Remarks
** Monthly value unknown

Consumptive Use

In the Tule River Hydrographic Unit, the largest quantity of water diverted from the Tule River and its tributaries is for power production, but by far the largest consumptive use of water is by irrigated agriculture. Consumptive use is defined as water consumed by vegetative growth in transpiration and building of plant tissue, and water evaporated from adjacent soil, from water surfaces, and from foliage. It also includes water similarly consumed and evaporated by urban and nonvegetative types of land use. Consumptive use of water involved in the operation of the two powerplants in the unit is negligible, consisting primarily of evaporation from canal surfaces. Much of the water diverted to Tule River Powerhouse of the Pacific Gas and Electric Company is rediverted by the Southern California Edison Company for its Tule Powerhouse. Water from the tailrace of the latter plant is in turn rediverted downstream for agricultural purposes.

As previously indicated, a substantial portion, but not all, of the water diverted in the unit was measured or estimated during the investigation. About 23,100 acre-feet of water were diverted for irrigation and stockwatering during the 12 months from April 1957 through March 1958. Of this total some 19,700 acre-feet were diverted during the months of April through November, the approximate period of irrigation during 1957. If it is assumed that the stockwatering use during this

period was a negligible proportion of the total, then the average diversion rate for the 3,720 acres irrigated by these diversion systems was 5.3 acre-feet per acre. The average seasonal diversion rates of individual systems varied from about 2 to 40 acre-feet per acre, but for the larger systems the rates vary from 3.4 to 7.5 acre-feet per acre.

The total seasonal consumptive use of applied water by crops on the afore-mentioned 3,720 acres of land, is estimated to have been 10,000 acre-feet. This is based on: (1) unit consumptive use values published in State Water Resources Board Bulletin No. 2, "Water Utilization and Requirements of California", June 1955, and tabulated below; (2) the crop distribution, described in Chapter III; and (3) a correction for 387 acres of these lands which did not receive a full irrigation. The average value of consumptive use of applied water on these lands (excepting those which received partial irrigation) is 2.8 acre-feet per acre.

<u>Crop</u>	<u>Unit consumptive use of applied water in acre-feet per acre</u>
Mixed, native, and meadow pasture	3.1
Field crops	2.0
Citrus and deciduous orchards	2.1

The total seasonal consumptive use of applied water by all irrigated crops in the unit (3,890 acres), is estimated to have been 10,400 acre-feet in 1957. This value was derived in a manner similar to that described in the previous paragraph.

Diversions for urban purposes in Springville totalled 322 acre-feet from April 1957 through March 1958. Based on values presented in Bulletin No. 2, it is estimated that about one-half, or 160 acre-feet of this amount, was consumptively used and one-half was available for reuse. Domestic consumptive use outside of Springville for the same period is estimated to have been about 130 acre-feet, based on a population of 1,000 and assuming the same rate of use as in Springville.

Water for recreational purposes in the Tule River Hydrographic Unit is used at summer homes, at a State Fish Hatchery, and at agricultural reservoirs which are incidentally used for fishing. About 150 acre-feet of water were supplied to a group of 210 summer homes at Camp Nelson in 1957. It is estimated that the total consumptive use of the approximately 350 summer homes in the unit was about 100 acre-feet. An estimated total of 700 acre-feet of water was diverted to the Moorehouse Springs Fish Hatchery during the period from April 1957 through March 1958. This use is essentially non-consumptive. The consumptive use of water by evaporation from agricultural reservoirs used for fishing has not been estimated, but is considered to be among those losses associated with the primary agricultural use.

The estimated consumptive use of applied water in areas of Tule River Hydrographic Unit which received water service during the 12-month period from April 1957 through March 1958 is summarized in the following tabulation:

<u>Purpose</u>	<u>Estimated consumptive use of applied water (in acre-feet)</u>
Hydroelectric power production	Negligible
Irrigation	10,400
Domestic	290
Recreation	<u>100</u>
Approximate total	10,800

Irrigation Efficiency

Farm irrigation efficiency is defined as the ratio of consumptive use of applied irrigation water to the total amount of water delivered to the farm, and is commonly expressed as a percentage.^{1/} Farm irrigation efficiency in the Tule River Hydrographic Unit may be derived from the values of applied water and consumptive use pertaining to the 3,720 acres of crops irrigated by the measured diversions. Because of ditch losses, not all of the 19,700 acre-feet of water diverted for irrigation actually reached the areas of use to become available for application to crops.

The few measurements of diversion ditch losses, which were made in 1957, indicate that such losses amount to 15 percent or more of the total diversions. If it is assumed that water losses between the points of measurement and the areas of use are 15 percent, the average amount of water applied to these crops was 16,700 acre-feet during the 1957 irrigation period. Comparison of the value of consumptive

^{1/} $\frac{CU}{D - L}$ Farm irrigation efficiency may be derived by where CU = Consumptive Use, D = total quantity of water diverted, and L = ditch losses.

use of applied water (10,000 acre-feet) with the value of applied water (16,700 acre-feet) indicates that the average farm irrigation efficiency is about 60 percent.

Inspection of the records indicates that the efficiency of irrigation in the spring was much lower than the seasonal average value as a consequence of the greater availability of water and the lower consumptive requirements of crops at that time of the year. Similarly, the efficiency in the late summer and fall was correspondingly higher than the average.

Records of runoff in the Tule River and its tributaries afford a means of assessing the overall effectiveness of irrigation in the Springville, Success and South Fork Subunits, which include all the irrigated lands in the Tule River Hydrographic Unit except for those relatively small areas in the North Fork and Middle Fork Subunits. The overall effectiveness of irrigation may be measured as the ratio of the consumptive use of applied water by crops in these subunits to the total consumptive use by irrigated crops and all other vegetation receiving moisture supplied either by direct application or by water lost incidentally to this application. This ratio is calculated to be 76 percent for the period from June through November 1957, based on (1) unit values of consumptive use of applied water

published in Bulletin No. 2, and (2) inflow and outflow as determined from runoff records, corrected as necessary for diversions above or below the stations.

The detailed inflow-outflow calculation to determine total consumptive use satisfied by the overall irrigation operation is set forth in Table 5. The approximate difference of 9,100 acre-feet between inflow and outflow for the foregoing subunits from June through November 1957 represents the total consumptive use of water applied therein for irrigation purposes. The entire irrigation period from April through November was not used in this calculation because there was considerable rainfall during April and May, and it was not feasible to measure the runoff originating in these subunits.

Available records indicate that, on the average, irrigated crops utilize about 78 percent of the total growing season consumptive use of applied water during the period from June through November. Thus the calculated consumptive use of applied water for the approximately 3,200 acres of irrigated crops in the three subunits listed in Table 5 is 6,900 acre-feet from June through November. This total is based on the average value of 2.8 acre-feet per acre with a correction for 57 acres which were not fully irrigated. The ratio of 6,900 to 9,100, a measure of the overall effectiveness of this irrigation operation, is 76 percent.

TABLE 5
 CALCULATION OF TOTAL CONSUMPTIVE USE
 OF SURFACE WATER USED FOR IRRIGATION IN
 SUCCESS, SPRINGVILLE AND SOUTH FORK SUBUNITS
 FROM JUNE THROUGH NOVEMBER 1957

Month: 1957	Inflow in acre-feet										Outflow in acre-feet									
	No. of Middle Tule R. plus Conduit:	So. Fk. Middle Fk. Tule R. above:	No. Fk. Tule R. at Springville:	So. Fk. for King & near Success:	Corrections: Tule R. at Springville:	So. Fk. for King & Tule R. Success:	Total Tule R. at Springville:	Total Tule R. at Worth:	Pioneer: Ditch:	Bridge:	Total Tule R. at Springville:	Total Tule R. at Worth:	Pioneer: Ditch:	Bridge:	Total Tule R. at Springville:	Total Tule R. at Worth:	less out- flow in acre-feet			
June	4,850	1,910	1,370	1,330	550	10,010	7,140	998	8,138	1,872										
July	1,650	848	30	159	490	3,177	421	447	868	2,309										
Aug.	1,080	595	25	0	311	2,011	44	0	44	1,967										
Sept.	914	560	11	0	254	1,739	25	30	55	1,684										
Oct.	1,070	832	63	218	313	2,496	975	254	1,229	1,267										
Nov.	1,110	875	274	485	157	2,901	2,360	234	2,594	307										
Correction to outflow for Springville consumptive use																				
Correction to outflow for diversions outside unit between Success Dam and Worth Bridge																				
															+ 136	-200				
															22,334	13,264	9,070			
Approximate Total June - November consumptive use of applied water for irrigation																				
																	9,100			

TABLE 6
INDEX TO SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Diversion name or owner	Location number	Subunit	References	
			Plate 2 Sheet No	Text and appendixes Page No.
Agency Ditch Tule River Indian Reservation	22S/29E-12J1	Reservation	4	35, C-16
Ainsworth Ditch Griswold, Arthur O.	19S/29E-35N1	North Fork	1	31, 42, 67
Akin Ditch Biedeback, William F.	20S/30E-32E1	Springville	2	29, 41, 66, C-13
Aston, William J.	See Vincent Ditch			
Avery, Carl	See Graham-Osborn Ditch			
Avery, Omer	See Graham-Osborn Ditch			
Bace, John E.	20S/30E-3E1	North Fork	2	33, 68, D-15, D-15
Bailey Ditch Killian, Roland R.	20S/29E-2F1	North Fork	2	32, 43, 67, D-12
Barton, Hildor	See Graham-Osborn Ditch			
Berry, William C.	20S/30E-10L1	North Fork	2	34, 68
Biedeback, William	See Akin Ditch			
Brockman, Bill	See Graham-Osborn Ditch			
Brundage Ditch Corzine, Ray Hart, W. C. O'Connor A.	19S/29E-35L1	North Fork	1	31, 42, 67
California State Department of Fish and Game	See Moorehouse Springs Fish Hatchery			
Camp Nelson Resort Greer, J. W.	20S/31E-27Q1	Middle Fork	2	28, 41, 66, C-3
Camp Nelson Water Company	20S/31E-27J1	Middle Fork	2	28, 41, 47, C-3
Chappel Ditch Tule River Indian Reservation	22S/30E-7F1	Reservation	4	36, C-16
Clement-Manier Ditch Pennington, William W.	21S/29E-15N1	Success	3	34, 37, 43, 69, D-12
Cole, Roy K.	19S/29E-26D1	North Fork	1	31, 42, 67
Corzine, Ray	See Brundage Ditch			
Costa, George	See Graham-Osborn Ditch			
Coughtry, Garland	See Vincent Ditch			

TABLE 6 (Continued)
INDEX TO SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Diversion name or owner	Location number	Subunit	References	
			Plate 2 Sheet No.	Text and appendixes Page No.
Crabtree-Akin Ditch Hanggi, J. J. Moore, John C. Witt, Walter A.	21S/29E-14B1	Success	3	24, 43, 68, D-12, D-13
Cranmore, Emory	See Graham-Osborn Ditch			
Dennison Ditch; Dennison Ditch Company	19S/30E-18R1	North Fork	1	32, 42, 67, C-4
Dickey, C. B.	19S/30E-19N1	North Fork	1	32, 67
Dillon Ditch Scruggs, Harry C.	19S/29E-24J1 19S/30E-19C1	North Fork North Fork	1 1	30, 42, 67 32
Duncan Ditch Sequoia Stock Farm	21S/30E-6D1	Springville	3	30, 42, 66, C-11, C-13
Eames, Ed	20S/29E-13P1 20S/29E-13P2	North Fork North Fork	2 2	33, 43, 68 33, 43, 68
Elster-Webb (Rutherford) Ditch Rumbley, W. F.	20S/30E-32E2	Springville	2	29, 42, 66, C-11, C-13
Everding, James	20S/29E-2E1 20S/29E-2M1 20S/29E-2N1	North Fork North Fork North Fork	2 2 2	32, 67 32 33
Fees, John	See Graham-Osborn Ditch			
Flagg-Cole Ditch McCulloch, W. A.	19S/29E-23K1 19S/29E-24N1	North Fork North Fork	1 1	30, 42, 67 31, 42, 67
Foote Ditch Krusche, Doris Wardlaw, Arthur	21S/29E-19D1	Success	3	35, 37, 44, 69
Gill, Clemmie	20S/29E-14J1	North Fork	2	33, 43, 68
Gill, Vernon	See Graham-Osborn Ditch			
Gordon, Hugh T.	21S/29E-4L1	Success	3	34
Gould, Ralph	See Graham-Osborn Ditch			
Graham-Osborn Ditch Avery, Carl Avery, Omer Barton, Hildor Brockman, Bill Costa, George Cranmore, Emory Fees, John Gill, Vernon Gould, Ralph Jesinghouse, John Reed, Wilson Remer, A. B.	21S/29E-2L1	Springville	3	30, 41, 68, C-5 D-12

TABLE 6 (Continued)
INDEX TO SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Diversion name or owner	Locotion number	Subunit	References	
			Plate 2 Sheet No.	Text and appendixes Page No.
Greer, J. W.	See Camp Nelson Resort			
Griswold, Arthur O.	19S/29E-25N1 See also Ainsworth Ditch	North Fork	1	31, 67
Hanggi, J. J.	21S/29E-24D1 See also Crabtree-Akin Ditch	Success	3	35, 44
Hart, W. C.	See Brundage Ditch			
Henderson, Alice	See King Ditch			
Holston, Charles T.	See Niles Ditch			
Hunter Ditch Tule River Indian Reservation	22S/30E-3M1	Reservation	4	36, C-16
Jesinghouse, John	See Graham-Osborn Ditch			
Jones, Bryan and Mildred	19S/29E-34F1	North Fork	1	31, 42, 67, D-16
Kibler, Frank K.	21S/29E-2F2	Springville	3	29, 41, 66
Killian, Roland R.	20S/29E-10H1	North Fork	2	33
	20S/29E-10J1	North Fork	2	33
	See also Bailey Ditch			
King Ditch Henderson, Alice	22S/29E-10N1	South Fork	4	36, 37, 44, 69
Kinyon, Earl D.	See Phariss Ditch			
Krusche, Doris	See Foote Ditch			
Lawson, Otis H. and N. E.	19S/30E-33N1	North Fork	1	32, 67, D-15
Long Canyon Ditch Rumbley, W. F.	20S/30E-32M1	Springville	2	29, 41, 66, D-15
McCulloch, W. A.	See Flagg-Cole Ditch			
McGinnis, Velmer W.	See James Everding			
McNab, Walter M. and Rouch, Claude A.	21S/29E-11L1	Springville	3	30, 42, 66, 68
Miller, Dawson	19S/30E-17N1	North Fork	1	31, 42, 67
Moore, John C.	See Crabtree-Akin Ditch			
Moorehouse Springs Fish Hatchery California State Department of Fish and Game	20S/31E-30R1	Middle Fork	2	29, 41, 47
Mt. Whitney Ditch; Mt. Whitney Ditch and Water Co.	21S/29E-1B1	Springville	3	29, 41, 66, C-5, C-15

TABLE 6 (Continued)
INDEX TO SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Diversion name or owner	Location number	Subunit	References	
			Plate 2 Sheet No.	Text and appendixes Page No.
Mullin, Gilbert	19S/30E-32L1	North Fork	1	32, 43, 67
Negus, F. C.	20S/29E-23H1	North Fork	2	33, 43, 66
Niles Ditch Holston, Charles T.	21S/29E-30K1	South Fork	3	36, 37, 44, 69
Norris, Norman L. and Cora M.	20S/29E-3C1	North Fork	2	33
O'Connor, A.	See Brundage Ditch			
Osborn, Clyde	19S/30E-17G1	North Fork	1	31, 42, 67
Pacific Gas and Electric Company	See Tule River Powerhouse Conduit			
Pennington, William W.	See Clement-Manier Ditch			
Phariss Ditch Kinyon, Earl D.	20S/29E-11G1	North Fork	2	33, 43, 68
Pioneer Ditch; Pioneer Water Company	21S/28E-26Q1	Success	3	34, 40, 43, C-7
Pleasant Valley Ditch; Pleasant Valley Canal Company	21S/29E-11E1	Springville	3	30, 37, 41, 68, C-8, D-13
Ratzlaff, Henry	20S/30E-3N1	North Fork	2	33, 68, D-15
Reed, Wilson	See Graham-Osborn Ditch			
Remer, A. B.	See Graham-Osborn Ditch			
Roberts, Norman D.	See Vincent Ditch			
Rose Ditch Wardlaw, Arthur	21S/29E-18R1	Success	3	35, 43, 69
Rouch, Claude A.	See McNab and Rouch			
Rumbley, W. F.	See Elster-Webb Ditch and Long Canyon Ditch			
Rutherford Ditch	See Elster-Webb Ditch			
Scruggs, Harry C.	See Dillon Ditch			
Sequoia Stock Farm	See Duncan Ditch			
South Tule Ditch; South Tule Independent Ditch Company	22S/29E-14D1	Reservation	4	35, 37, 44, 69, C-9
	22S/29E-15C1	South Fork	4	36, 37, 44, 69, C-9
Southern California Edison Company	See Tule Powerhouse Conduit			
Springville Pipe Tulare County	21S/30E-6D2	Springville	3	20, 30, 42, C-15, D-13

TABLE 6 (Continued)
INDEX TO SURFACE WATER DIVERSIONS IN
TULE RIVER HYDROGRAPHIC UNIT

Diversion name or owner	Location number	Subunit	References	
			Plate 2 Sheet No.	Text and appendixes Page No.
Springville Public Utility District	See Springville Pipe			
Stillion, A. J.	See Walker Ditch			
Templeton, Carlos	See Wilcox (South Fork) Ditch			
Tulare County	See Springville Pipe			
Tule Powerhouse Conduit Southern California Edison Company	20S/30E-26D1 20S/30E-26D2	Middle Fork Middle Fork	2 2	10, 28, 41, 45, C-11 10, 28, 41, 45, C-11
Tule River Indian Reservation	See Agency Ditch, Chappel Ditch, and Hunter Ditch			
Tule River Powerhouse Conduit Pacific Gas and Electric Company	20S/31E-7Q1 20S/31E-18B1 20S/31E-18D1	Middle Fork Middle Fork Middle Fork	2 2 2	10, 28, 41, 45, C-6 10, 28, 41, 45, C-6 28, 41, 45, C-6, D-15
Urmy, Ralph B.	19S/29E-34G1	North Fork	1	31, 42, 67
Vincent Ditch Aston, William J. Coughtry, Garland Roberts, Norman D.	21S/29E-17M1	Success	3	35, 43, 69
Walker Ditch Stillion, A. J.	21S/29E-2F1	Springville	3	29, 41, 66, C-15
Walters, Carl	19S/30E-18Q1	North Fork	1	31, 42, 67
Wardlaw, Arthur	See Foote Ditch and Rose Ditch			
Wilcox (South Fork) Ditch Templeton, Carlos	21S/28E-25K1	South Fork	3	10, 36, 40, 44, 68
Wilcox Ditch Wilcox Estate, et al.	21S/28E-24F1	Success	3	34, 37, 43, 68
Witt, Walter A.	21S/29E-15N2 See also Crabtree-Akin Ditch	Success	3	35

CHAPTER III - LAND USE

A thorough understanding of the present water and land uses in the Tule River Hydrographic Unit is essential to the determination of future water requirements within the unit. The results of a survey of surface water uses and facilities were presented in Chapter II. The results of a survey of present land uses, are presented in this chapter. A brief summary of historical conditions is also included.

Historical Land Use

As previously noted, the earliest development in the Tule River Hydrographic Unit took place in the late 1850's. There is little information available to indicate the rate of development thereafter, but the period 1860-1880 was evidently one of rapid development, as indicated by the number of water diversion systems which were started then. The first survey of land use in the area was made in 1885 by the State Engineer, and since that time a number of similar surveys have been conducted. In all these surveys, however, the land uses in the Tule River Hydrographic Unit were included with those for larger areas, making it difficult or impossible to derive any developmental rates for this specific unit.

The most significant historical data reported in connection with these surveys pertain to the year 1901. They were published in 1902 by the U. S. Department of Agriculture, Office of Experiment Stations, in Bulletin No. 119.

The bulletin includes a summary of agricultural lands irrigated by diversions located within the boundaries of this unit. Not all diversion systems existing at that time were reported in Bulletin No. 119, but the 13 which were considered were used to irrigate a total of 977 acres. Twelve of these remain active and are now used to irrigate about 3,000 acres, of which a portion is located within the high-water line of Success Reservoir. On the basis of information contained in Bulletin No. 119, it is estimated that a total of about 1,500 acres of land were irrigated in the Tule River Hydrographic Unit in 1901. The survey indicated that the crops consisted of alfalfa, pasture, truck, deciduous and citrus fruits.

Present Land Use

A detailed land use survey was conducted in the Tule River Hydrographic Unit during the spring of 1957 as a part of this investigation. The mapped land uses fall into four broad groups: irrigated agriculture, dry-farmed agriculture, urban development, and recreational development. The various types of land use in 1957 are delineated on Sheets 1 through 4 of Plate 2. The areas of land use within each subunit are enumerated in Table 7.

The survey was accomplished by plotting field observations on aerial photographs taken in 1952 and 1956 at a scale of approximately 1:20,000. As the present use of

TABLE 7

LAND USE IN
TULE RIVER HYDROGRAPHIC UNIT, 1957
(In acres)

Subunit	Irrigated lands	Naturally irrigated meadowlands	Dry- farmed	Urban	Recreation	
					Residential	Parks
Middle Fork	27	197	0	12	275	1,195
Springville	587	9	2	204	0	0
North Fork	595	0	239	0	0	2,307
Success	2,688*	0	755*	23*	0	22*
Reservation	0	0	0	0	0	0
South Fork	<u>729</u>	<u>0</u>	<u>17</u>	<u>3</u>	<u>0</u>	<u>0</u>
TOTAL	4,626	206	1,013	242	275	3,524

*Includes lands within high-water line of Success Reservoir under construction in 1960.

each parcel of land was determined, it was delineated on the aerial photographs. Stereoscopes were used in conjunction with field observations to assist in this operation. The area was covered by automobile as completely as roads and trails permitted. This was supplemented by inspections on foot and studies of the photographs in areas not easily accessible. An example of an aerial photograph with land use data is shown on page 63.

After completion of field mapping on photographs, the delineations were transferred, at a scale of 1:24,000, to United States Geological Survey quadrangle sheets. This procedure was necessary to bring the various delineated areas to a common scale, since the scale of aerial photographs often varies widely, even on a single flight. An ozalid vellum print of each quadrangle sheet was then obtained, the delineated areas were cut out, and the pieces weighed on an analytical balance. The final acreage of each classification was determined by relating the weights to areas. Because of the large number of small parcels involved, this method was more expedient and more accurate than other available means of area determination. The areas of mapped lands are gross areas without reduction for roads, farmsteads, canals, and miscellaneous rights of way which occur within the mapped areas.

Giant Sequoia
in Balch Park

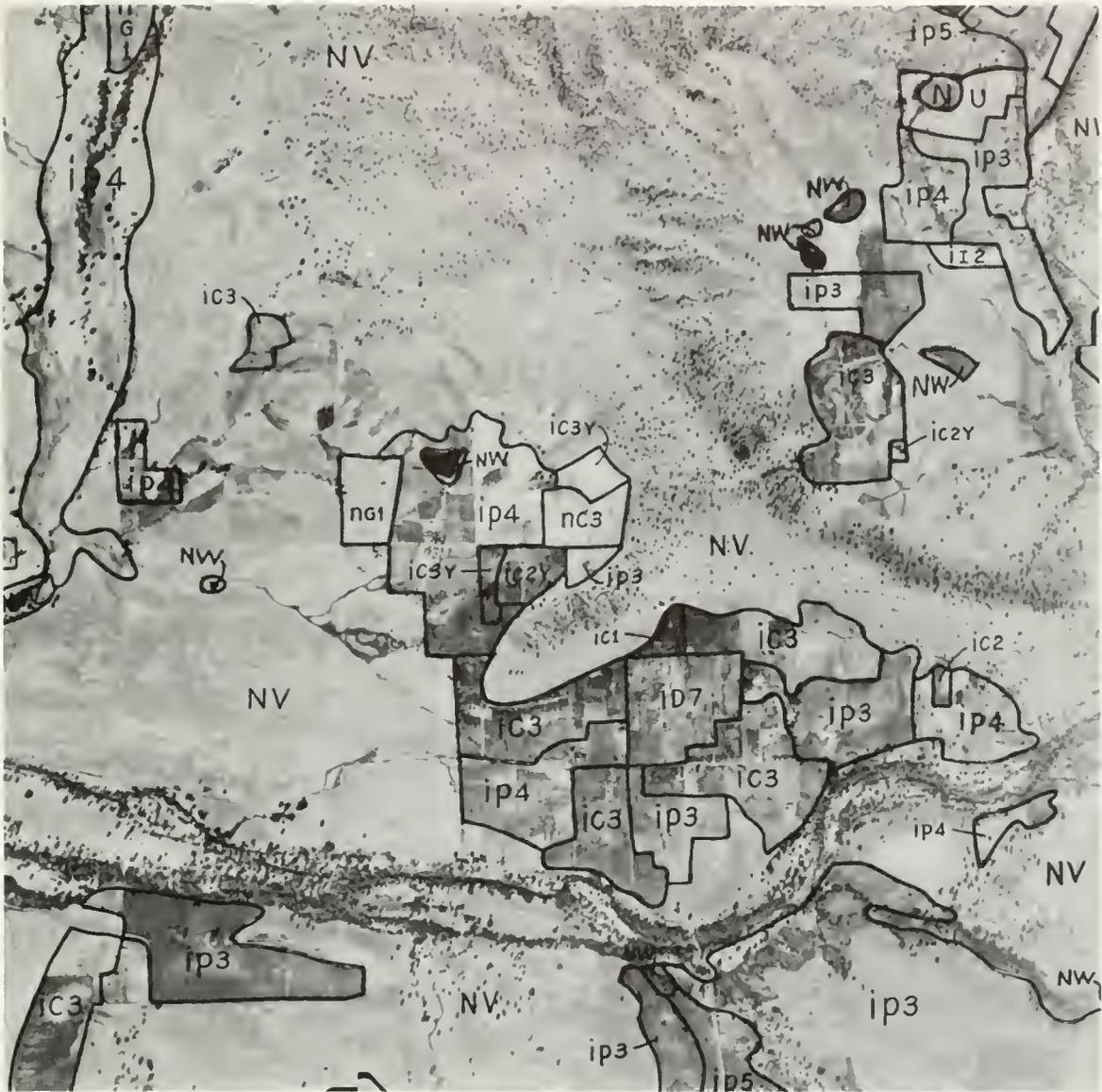


Pasture land near
Springville

Irrigated Lands

Irrigated lands, as designated in this report, include all agricultural lands which receive applied water. These lands are detailed in Table 8 by diversion and by subunit. Although the irrigated lands are tabulated under the name of the subunit within which the lands are located, it should be noted that the diversion serving the lands may originate in another subunit upstream and that a given diversion may serve lands in more than one subunit. These lands were delineated on the work maps by diversion service area and by crop irrigated; but the separate parcels are combined and shown on Plate 2 in three categories: (1) those which received a full irrigation in 1957, (2) those which received a partial irrigation due to lack of sufficient water supply to irrigate throughout the entire season in 1957, and (3) those lands usually irrigated but which were idle or fallow in 1957. The limited acreage irrigated by ground water is included in Table 8 and delineated on Sheets 2 and 3 of Plate 2. This acreage consists of 399 acres in three parcels (including one irrigated idle parcel) located in Success Subunit, which were irrigated entirely by ground water, and one parcel of 94 acres in the North Fork Subunit, which was irrigated by both surface and ground water.

In Table 8, irrigated lands are segregated into pasture, field crops, orchard, and other lands which are



Example of Land Use Delineated on Aerial Photograph

Symbols used on this photograph:

- | | |
|-------------------------------------|--------------------------------------|
| ip3 - irrigated mixed pasture | iD7 - irrigated plums |
| ip4 - irrigated native pasture | iI2 - irrigated idle - being cleared |
| ip5 - irrigated meadow pasture | nG1 - nonirrigated wheat |
| ic1 - irrigated grapefruit | U - urban |
| ic2 - irrigated lemons | NV - native vegetation |
| ic2Y - nonbearing irrigated lemons | NW - water surface |
| ic3 - irrigated oranges | |
| ic3Y - nonbearing irrigated oranges | |

ordinarily irrigated but which were idle or fallow during the year of survey. Pasture lands are further subdivided into mixed, native, and meadow pasture, the latter comprising native pasture lands having a high-water table induced by application of irrigation water. Orchard crops are subdivided into subtropical varieties, consisting mostly of citrus, with some olives and deciduous orchards. Field crops in 1957 consisted almost entirely of cotton.

Naturally Irrigated Meadowlands

In addition to the lands supplied by direct diversion of surface or ground waters, as described in the preceding paragraph, there are other lands which do not receive applied water, but which utilize water from a naturally high water table, such as mountain meadows or lands adjacent to streams. These are shown in Table 7 and on Plate 2 in a separate category designated "Naturally irrigated meadowlands".

Dry-farmed Lands

Dry-farmed lands are those cropped areas which do not receive water in excess of the natural precipitation, and lands that are normally planted to dry-farmed crops, but which at the time of the survey were either lying idle or tilled but not planted (i.e., fallow lands). Also included in this category are lands formerly dry-farmed but which were lying idle at the time of the survey. If lands of the latter type had been idle for a long enough period

to be covered with native vegetation, they were so mapped, and are included herein with "Other lands". Dry cattle range lands, which are indistinguishable from lands with native cover not used for grazing purposes, are similarly included with "Other lands". Water use in both cases is identical and is dependent upon precipitation.

Urban Lands

Urban lands include the total areas of cities and towns, small communities, and industrial areas which are large enough to be delineated. The acreages represent gross delineations, including streets and vacant lots. The criteria of the limiting density at community boundaries used in this survey is approximately one residence per two acres.

Recreational Lands

Lands placed in the recreational category include camp and trailer sites, resorts, and permanent and summer home developments in predominantly recreational areas, as well as motels and other commercial establishments which are necessary to service recreational areas. This category also includes parks located outside delineated urban areas. As in the case of urban lands, these areas, as delineated, are not necessarily fully developed.

TABLE 8

IRRIGATED LANDS IN
TULE RIVER HYDROGRAPHIC UNIT, 1957
(In acres)

Location number	Diversion or other source serving irrigated lands	Diversion name or owner	Pasture		Field crops	Orchard		Total lands irrigated	Irrigated: idle or fallow	Total
			Mixed	Native		Sub-tropical	Deciduous			
<u>M D B & M</u>										
20S/31E-27Q1		Camp Nelson Resort	—	27	—	—	—	27	—	27
Total Middle Fork Subunit										
			0	27	0	0	0	27	0	27
<u>Middle Fork Subunit</u>										
20S/29E-23H1 (North Fork Subunit)		F. C. Negus	23b	37b				60		60
20S/30E-32E1		Akin Ditch		27				27		27
20S/30E-32E2		Elster-Webb Ditch	50	41				91		91
20S/30E-32E2) 20S/30E-32M1)		Elster-Webb Ditch and Long Canyon Ditch		11				11		11
21S/29E-1B1		Mt. Whitney Ditch	100	76	4		41	221	5	226
21S/29E-2F1		Walker Ditch			17			17		17
21S/29E-2F2		Frank K. Kibler	10					10		10
21S/29E-11L1		Walter M. McNab and Claude A. Rouch	17				8	25		25
21S/30E-6D1		Duncan Ditch	—	120	—	—	—	120	—	120
Total Springville Subunit										
			200	312	21	0	49	582	5	587

TABLE 8 (Continued)

IRRIGATED LANDS IN
TULE RIVER HYDROGRAPHIC UNIT, 1957
(In acres)

Location number	Diversion name or owner	Mixed : Native : Meadow :	Pasture	Field : crops	Orchard	Total : lands : irrigated :	Irrigated ^a : Total
					Sub- : tropical : Deciduous :	lands : irrigated :	idle or : fallow :
<u>M D B & M</u>							
<u>North Fork Subunit</u>							
19S/29E-24J1	Dillon Ditch (Springs)		20			20	20
19S/29E-23K1	Flag-Cole Ditch		18			18	18
19S/29E-24N1							
19S/29E-25N1	Arthur O. Griswold		11			11	11
19S/29E-26D1	Roy K. Cole	8 ^b				8	8
19S/29E-34F1	Bryan and Mildred Jones	9				9	9
19S/29E-34G1	Ralph B. Urmey		4 ^b			4	17
19S/29E-35L1	Brundage Ditch		46 ^c			46	46
19S/29E-35LL1	Brundage Ditch and Dennison Ditch		34 ^d			34	34
19S/29E-35N1	Ainsworth Ditch		13			13	13
19S/30E-17G1	Clyde Osborn		21			21	25
19S/30E-17N1	Dawson Miller				14	14	14
19S/30E-18Q1	Carl Walters	7			3	10	10
19S/30E-18R1	Dennison Ditch	29	16		9	54	69
19S/30E-19N1	C. B. Dickey		5			5	5
19S/30E-32L1	Gilbert Mullin		14			14	14
19S/30E-33N1	Otis H. and N. E. Lawson				4	4	4
20S/29E-2E1	James Everding						18
20S/29E-2F1	Bailey Ditch	8 ^b	86 ^b			94	94

TABLE 8 (Continued)

IRRIGATED LANDS IN
TULE RIVER HYDROGRAPHIC UNIT, 1957
(In acres)

Division or other source serving irrigated lands	Location number	Diversion name or owner	Pasture		Field crops	Orchard		Total lands irrigated	Irrigated: idle or fallow	Total
			Mixed	Native		Sub-tropical	Deciduous			
<u>M D F & M</u>										
<u>North Fork Subunit (Continued)</u>										
21S/29E-11G1		Phariss Ditch		94 ^{b,e}				94		94
21S/29E-13F1		Ed Eames		7 ^b				7		7
21S/29E-13F2		Ed Eames		12 ^b				12		12
21S/29E-14J1		Clemmie Gill	16					16		16
21S/30E-3E1		John E. Bace				17		17		17
21S/30E-3W1		Henry Ratzlaff				7		7		7
21S/30E-10L1		William C. Berry				13		13		13
Total North Fork Subunit			77	401	0	0	67	545	50	595
<u>Success Subunit</u>										
21S/28E-4F1		Willcox Ditch		14			17	31	123	154
21S/28E-25K1 (South Fork Subunit)		Willcox (South Fork) Ditch	12 ^b	14 ^b				57		57
21S/29E-2L1 (Springville Subunit)		Graham-Osborn Ditch	649				13	683		683
21S/29E-2L1 (Springville Subunit)		Crabtree-Akin Ditch and Graham-Osborn Ditch	53				2	66		66
21S/29E-11E1 (Springville Subunit)		Pleasant Valley Ditch	169	220			249	714	33	747
21S/29E-11L1 (Springville Subunit)		Walter M. McNab and Claude A. Touch	22					22		22
21S/29E-14B1		Crabtree-Akin Ditch	73	7	11			91		91

TABLE 8 (Continued)

 IRRIGATED LANDS IN
 TULE RIVER HYDROGRAPHIC UNIT, 1957
 (In acres)

Diversion or other source serving irrigated lands	Pasture		Field crops	Orchard		Total lands irrigated	Irrigated ^a : idle or fallow	Total
	Mixed	Native		Meadow	Sut-			
Location number	Diversion name or owner							
<u>M D B & M</u>								
<u>Success Subunit (Continued)</u>								
21S/29E-15N1	Clement-Manier Ditch	55			39	94		94
21S/29E-17M1	Vincent Ditch		61	37		98	153	251
21S/29E-18R1	Rose Ditch	11	90			101		101
21S/29E-19D1	Foote Ditch	23				23		23
	Ground water supply	<u>7</u>	<u>---</u>	<u>101</u>	<u>7</u>	<u>115</u>	<u>284</u>	<u>392</u>
	Total Success Subunit	1,074	406	71	327	2,095	593	2,688
<u>Reservation Subunit</u>								
	Total Reservation Subunit	0	0	0	0	0	0	0
<u>South Fork Subunit</u>								
21S/29E-30K1	Niles Ditch	7				7		7
21S/29E-30K1	Niles Ditch and South Tule Ditch	4				4		4
22S/29E-14D1								
22S/29E-15C1	(Reservation Subunit)							
21S/29E-17M1	Vincent Ditch		8		11	19	59	78
	(Success Subunit)							
22S/29E-10N1	King Ditch			17		17		17
22S/29E-14D1	South Tule Ditch	<u>68</u>	<u>108</u>	<u>20</u>	<u>392</u>	<u>594</u>	<u>29</u>	<u>623</u>
22S/29E-15C1		79	116	37	404	641	88	729
	Total South Fork Subunit							

TABLE 8 (Continued)

IRRIGATED LANDS IN
TULE RIVER HYDROGRAPHIC UNIT, 1957
(In acres)

Location number	Diversion name or owner	Irrigated lands		Pasture	Field crops	Orchard	Sub-tropical	Deciduous	Total lands irrigated	Irrigated ^a idle or fallow	Total
		Mixed	Native								
		7	0	0	101	7	0	115	284		399
	Lands irrigated by ground water	1,423	1,262 ^e	129	73	773	115	3,775	452		4,227
	Lands irrigated by surface water	1,430	1,262	129	174	780	115	3,890	736		4,626
	TOTAL TULE RIVER HYDROGRAPHIC UNIT										

M. D. B. & M.

Summary:

- a - Land ordinarily irrigated, but idle or fallow in 1957.
- b - Received partial irrigation.
- c - 34 acres received partial irrigation.
- d - 17 acres received partial irrigation.
- e - 94 acres received supplemental supply of ground water.

Other Lands

All lands not included in the above categories are essentially in a native state. They total some 241,000 acres, or 96 percent of the area of the entire unit. These lands are to some extent used for commercial timber production, cattle range, fishing, hunting, and hiking. They also include scattered residences and other isolated uses covering areas of a few acres or less, which were too small to be separately mapped in this survey.

CHAPTER IV - LAND CLASSIFICATION

Results of a land classification survey conducted in the Tule River Hydrographic Unit in 1957 are presented in this chapter. Lands were not classified in this survey with respect to their potential use for urban development. The use of lands for urban purposes is closely related to population at any given time, and it is planned to defer designation of these lands until estimates of population and related economic studies are made in connection with determinations of future water requirements.

The former Division of Water Resources made a reconnaissance classification of lands of the State which was reported in State Water Resources Board Bulletin No. 2. In that report, the area of the Tule River Hydrographic Unit was included within a "Tule River" unit containing portions of the drainage areas of Deer Creek and White River. The data on agricultural lands reported herein are in considerably greater detail than the information in Bulletin No. 2. This bulletin also includes additional data on potential recreational lands.

Results of the land classification survey conducted in the Tule River Hydrographic Unit in 1957 are presented on Plate 3, "Classification of Lands", Sheets 1 through 4. The totals of areas in each classification are shown in Table 9.

Agricultural lands located within Success Reservoir below the normal high-water line elevation of 652.5 feet have not been classified as to irrigability.

Methods and Procedures

Lands were classified by field inspection, plotted on aerial photographs in the field, and the total area of each class was determined by methods similar to those previously described for the survey of present land use. An example of an aerial photograph with land classification data is shown on page 77.

Land Classification Standards

Irrigable agricultural lands have been classified, in accordance with their topographic characteristics, as V, H, or M lands. These symbols are defined as follows:

- V - These lands are level or slightly sloping and vary from smooth to hummocky or gently undulating relief. The maximum allowable slope is 6 percent for smooth, reasonably large-sized bodies lying in the same plane. As the relief increases and becomes more complex, lesser slopes are limiting. These lands are suitable for all climatically adapted crops.
- H - These are lands with greater slope and/or relief than those of the V class. They vary from smooth to moderately rolling or undulating relief. The maximum allowable slope is 20 percent for smooth, reasonably large-sized bodies lying in the same plane. As the relief increases and becomes more complex, lesser slopes are limiting.

- M - These are lands with greater slope and/or relief than those of the H class. They vary from smooth to steeply rolling or undulating relief. The maximum allowable slope is 30 percent for smooth, reasonably large-sized bodies lying in the same plane. As the relief increases and becomes more complex, lesser slopes are limiting.

These lands contain permeable soils with deep to medium effective root zones, and are free of rock, salinity, alkalinity, and are not limited by a high water table, unless modified by one or more of the following subsymbols:

- w - Lands with a high water table which, in effect, limits their present crop adaptability to pasture crops. Drainage and a change in irrigation practice would be required to affect the crop adaptability.
- s - Indicates the presence of an excess of soluble salts or exchangeable sodium in slight amounts, which limits the present adaptability of these lands to crops tolerant to such conditions. The presence of salts within the soil generally indicates poor drainage and a medium to high water table. Reclamation of these lands will involve drainage and the application of small amounts of amendments and some additional water over and above crop requirements in order to leach out the harmful salts.
- ss - Indicates the presence of an excess of soluble salts or exchangeable sodium in sufficient quantity to require the application of moderate amounts of amendments and some additional water over and above crop requirements in order to effect reclamation.
- sa - Indicates the presence of an excess of soluble salts or exchangeable sodium in sufficient quantity to require the application of large amounts of amendments and some additional water over and above crop requirements in order to effect reclamation.

- h - Indicates very fine textures, which make these lands best suited for production of shallow-rooted crops.
- l - Indicates fairly coarse textures and low moisture-holding capacities which, in general, make these lands unsuited for the production of shallow-rooted crops because of the frequency of irrigations required to supply the water needs of such crops.
- p - Indicates shallow depth of the effective root zone, which limits use of these lands to shallow-rooted crops.
- r - Indicates the presence of rock on the surface or within the plow zone in sufficient quantity to prevent use of the land for cultivated crops.

Urban and recreational lands have been classified as follows:

- U - The total area of cities, towns, and small communities presently used for residential, commercial, recreational and industrial purposes.
- RR - Existing and potential permanent and summer home tracts within a primarily recreational area.
- RC - Existing and potential commercial areas which occur within a primarily recreational area and which include motels, resorts, hotels, stores, etc.
- RT - Existing and potential camp and trailer sites within a primarily recreational area.
- RP - Existing and potential state and federal parks, racetracks, fairgrounds, and other very low water-using areas.

Miscellaneous lands include the following classes:

- F - Presently forested lands, or lands subject to forest management, which meet the requirements for irrigable land but which, because of climatic conditions and physiographic position, are better suited for timber production or some type of forest management program rather than for irrigated agriculture.



Example of Land Classification Delineated on Aerial Photograph
(See page 74 for symbol explanation)

- Vm - Swamp and marsh lands which usually support a heavy growth of phyreatophytes and are covered by water most of the time.
- N - Includes all lands which fail to meet the requirements of the above irrigable, urban and recreational, and miscellaneous classes.

Irrigable Lands

Irrigable lands are grouped in appropriate classifications according to their suitability for development under irrigated agriculture and to their crop adaptability. Presently irrigated lands are included within these classifications, but urban lands and recreational lands are not classed as to irrigability. In this survey, only physical characteristics of the land were considered. The characteristics of the soil were established by examination of road cuts, ditch banks, and the material from test holes, together with observations of the type and density of native vegetation and crops. The time element with respect to when the lands might be developed did not enter the determination, except that suitability for irrigated agriculture was necessarily considered in light of present agricultural technology.

There are many factors which influence the suitability of land for irrigation development. Soil characteristics and physiography are the most stable aspects of the land, and were therefore considered in classifying lands as to irrigability. Other aspects such as those economic factors related

to the production and marketing of climatically adapted crops, the location of lands with respect to a water supply, and climatic conditions were not considered in the basic classification. These latter factors are very important in estimating the nature of future cropping patterns and practices and will be given due consideration when estimates are made of future water requirements.

Urban Lands

As previously stated, the lands of the Tule River Hydrographic Unit were not classified with respect to their potential urban use. Therefore, only those lands devoted to urban uses in 1957 are designated herein as "urban" lands.

Recreational Lands

Present trends indicate an expanding rate of use and demand for recreational facilities throughout the State. In view of these trends and the ever-increasing population, it is recognized that there will be a demand for substantial land areas for recreational purposes. This is particularly true of the mountainous regions where this type of development is expanding rather rapidly at the present time. In the Tule River Hydrographic Unit the mountains in the eastern portion provide an important recreational potential.

Generally speaking, all mountainous lands are suitable for some recreational use such as hunting, fishing, and similar outdoor activities. However, for purposes of this

investigation, lands classified for recreational use were limited to those which are now, or in the future, may be used intensively for permanent and summer home tracts, camp and trailer sites, and parks outside of urban areas.

Home tracts and camp and trailer sites were classified by field observation. Primary considerations for both classifications were such physical factors as soil depth, slope, and rockiness; such aesthetic values as view, nearness to lakes or streams, or density and type of forest canopy suitable for the respective uses; and the plans of United States and State forest officials. An important factor in location of camp and trailer sites is the availability of an existing water supply, but isolation from existing roads did not influence site selection. Success Subunit is considered to have but a nominal recreational potential as a result of the construction of Success Dam and Reservoir, because of the probable large range in fluctuation of water level and the proposed small permanent water pool. The recreational potential of this subunit could be materially increased if a larger permanent water pool could be provided.

The total areas of federal and state parks, rather than the specific areas of potential intensive development therein, are delineated as recreational lands on Plate 3. For other parks only the present areas of intensive recreational use are delineated. The recreational lands delineated as park

Recreation in
the High Sierra



Recreation in
the High Sierra

areas are identical on both the land classification maps (Plate 3) and the present land use maps (Plate 2), since it was not possible to pinpoint additional future park development.

Miscellaneous Lands

Presently forested lands or lands best suited for forest management which are otherwise irrigable are classed as "F" lands, in areas where this is appropriate. However, no lands in the Tule River Hydrographic Unit were classified in this category.

No lands in the Tule River Hydrographic Unit were placed in the swamp and marsh (Vm) class. Lands which failed to meet the requirements of the previously described urban, agricultural, and recreational classifications total some 223,000 acres or 89 percent of the area of the unit.

TABLE 9
 CLASSIFICATION OF LANDS IN
 TULE RIVER HYDROGRAPHIC UNIT
 (in acres)

Subunit	Irrigable agricultural lands											Presently developed urban lands, 1957	Recreational lands								
	V	Vw	Vh	Vl	Vp	Vr	Vpr	H	Hp	Hr	Hpr		M	Mr	Mp	Mpr	Total	Rd	Rt	Rp	Total
Middle Fork	0	200	0	0	0	0	0	0	0	0	0	10	0	0	0	210	12	2,410	1,260	1,200	4,870
Springville	40	30	0	0	0	0	140	180	250	190	50	10	260	60	1,210	204	100	10			110
North Fork	220	0	0	0	0	150	2,370	20	650	70	360	10	80	0	3,930	0	310	1,800	2,310		4,420
Success	910	60	30	40	1,050	0	140	210	5,370	0	530	0	1,000	280	9,620*	14*	0	0	0	0	0
Reservation	0	0	0	0	0	0	140	150	90	0	0	0	140	40	560	0	0	40	0	0	40
South Fork	0	40	60	0	90	10	70	1,420	0	20	0	0	610	20	2,340*	3	0	0	0	0	0
TOTAL	1,170	330	90	40	1,140	160	140	2,930	7,140	990	810	4,20	2,090	400	17,870*	233*	2,820	3,110	3,510		9,440

* Excludes lands within high-water line of Success Reservoir under construction in 1960.

CHAPTER V - SUMMARY

The Tule River Hydrographic Unit comprises the 392-square mile (250,700-acre) watershed of the Tule River in south-central Tulare County above the San Joaquin Valley floor. Most of the terrain in the unit is very rugged and mountainous. Valley and foothill lands constitute only about seven percent of the total area. Agriculture, which developed initially in the late 1850's, is the largest single commercial enterprise in the unit. Approximately one-fifth of the presently developed agricultural lands are dry-farmed; four-fifths are irrigated. Major irrigated crops are pasture and subtropical orchard. Lumbering and recreation are also important local activities. The largest community in the unit is Springville, with a population of about 1,250.

Water Use

There were 69 diversions of water from surface streams located in the Tule River Hydrographic Unit in 1957 which equal or exceed the minimum size reported. Two significant hydroelectric powerplants are located in the unit, but most of the diversions (60 in 1957) are used for irrigation purposes.

Most of these diversions are based on riparian rights and on appropriative rights established prior to enactment of the Water Commission Act of 1914. Generally there are no official records of the riparian water rights,

except those records resulting from litigation. Many of the early appropriative rights are not of record, since those rights established prior to 1914 were based on actual diversion and use of water.

Since 1914 a total of 37 currently valid applications have been made for diversions in the unit. Permits or licenses have been granted for 33 of these applications. Two applications for diversion and storage at Success Dam and Reservoir and two for diversion of small quantities for domestic use are pending.

Of the total 3,890 acres of land irrigated in the unit in 1957, ground water was used to irrigate 115 acres and surface water was used to irrigate 3,775 acres.

The total consumptive use of applied water in the Tule River Hydrographic Unit for all purposes for the period from April 1957 through March 1958 is estimated to have been 10,800 acre-feet. Nearly all of the water diverted in the unit for power, irrigation and other purposes during the same period was measured during this investigation and amounted to some 77,000 acre-feet.

Irrigation is by far the greatest consumptive use of water in the unit, and for 1957 the consumptive use of water applied to irrigated crops is estimated to have been 10,400 acre-feet. Average farm irrigation efficiency is

estimated to be about 60 percent. The overall effectiveness of the combined irrigation operation of the many individual diversion systems, is estimated to be about 76 percent.

Land Use

The present use of land in the Tule River Hydro-graphic Unit, as indicated by the 1957 survey, is shown in Figure 1 as follows:

<u>Use</u>	<u>Area, in acres</u>
Agriculture	
Lands irrigated in 1957	3,890
Lands usually irrigated but idle or fallow in 1957	736
Naturally irrigated meadowlands	206
Dry-farmed lands	<u>1,013</u>
	5,845
Urban	242
Recreation	
Summer home areas	275
Parks	<u>3,524</u>
	<u>3,799</u>
Approximate total	9,900

The 9,900 acres represent 3.9 percent of the total area of the unit. Nearly all of the 3,524 acres of parks in the unit is located in an undeveloped portion of Sequoia National Park, leaving the actual area of intensive development at about 2.5 percent of the total acreage of the unit.

Land Classification

The results of the land classification survey conducted in 1957, as shown in Figure 2, are summarized on the following tabulation.

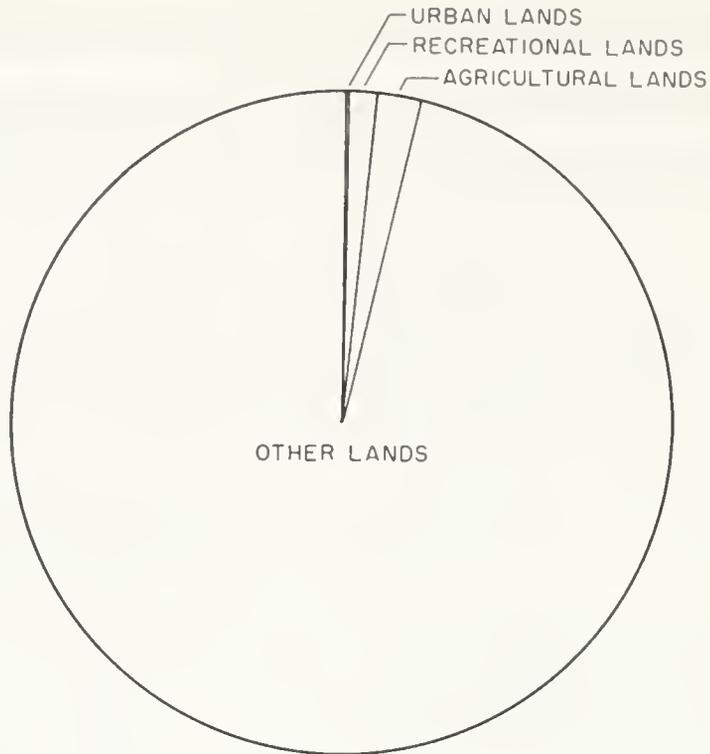


Figure 1
1957 LAND USE



Figure 2
CLASSIFICATION OF LANDS

<u>Classification</u>	<u>Area, in acres</u>
Irrigable agricultural lands	17,870*
Recreational lands	<u>9,440</u>
Approximate total	27,310

*Excludes irrigable lands within the area to be inundated by Success Reservoir.

The above figures represent 7.1 and 3.8 percent, respectively, of the total area of the unit.

About 96 percent of the irrigable lands are located in the Springville, North Fork, Success, and South Fork Subunits which contain substantially all the valley and foothill lands. Approximately 98 percent of the recreational lands are located in the higher mountainous areas of the Middle Fork and North Fork Subunits.

APPENDIX A

STATEWIDE WATER RESOURCES AND WATER REQUIREMENTS
PROGRAM

APPENDIX A

STATEWIDE WATER RESOURCES AND WATER REQUIREMENTS PROGRAM

California's major water problem today is that of development and delivery of supplemental water supplies to meet increasing water requirements throughout the State. The problem involves (1) the regulation of seasonal and cyclic fluctuation of stream flow to meet demand schedules in the areas of origin, and (2) the transmission of regulated surplus flows over long distances to areas of deficiency. The development and long distance transfer of water is currently accomplished by such major facilities as the federal Central Valley Project and the Colorado River Aqueduct of the Metropolitan Water District of Southern California. However, such development and transfer will be considerably broadened in scope by the State Water Facilities.

Consumptive water requirements of the State on a basin-wide basis were estimated in State Water Resources Board Bulletin No. 2, "Water Utilization and Requirements of California", June 1955. However, to provide for local water needs while considering specific export projects, more detailed information must be made available on present and projected future water requirements of the areas in which the projects are to be built. This will necessitate the considerably more detailed collection and analysis of data on hydrology, land use and land capability, and economics.

Recognizing that additional information is needed if the water needs of areas of origin are to be adequately protected in large-scale water development projects, the 1956 Legislature authorized an investigation to determine the water resources and water requirements of the respective watersheds in the State. The authorization is contained in Chapter 61, Statutes of 1956 as amended by Chapter 2025, Statutes of 1959. This legislation is codified in Section 232 of the Water Code as follows:

"232. The Legislature finds and declares that in providing for the full development and utilization of the water resources of this State it is necessary to obtain for consideration by the Legislature and the people, information as to the water which can be made available for exportation from the watersheds in which it originates without depriving those watersheds of water necessary for beneficial uses therein. To this end, the department is authorized and directed to conduct investigations and hearings and to prepare findings therefrom and to report thereon to the Legislature at the earliest possible date with respect to the following matters:

(a) The boundaries of the respective watersheds of the State and the quantities of water originating therein;

(b) The quantities of water reasonably required for ultimate beneficial use in the respective watersheds;

(c) The quantities of water, if any, available for export from the respective watersheds;

(d) The areas which can be served by the water available for export from each watershed; and

(e) The present use of water within each watershed together with the apparent claim of water right attaching thereto, excluding individual uses of water involving diversions of small quantities which, in the judgment of the Director of Water Resources, are insufficient in the aggregate to materially affect the quantitative determinations included in the report.

"Before adopting any findings which are reported to the Legislature, the department shall hold public hearings after reasonable notice, at which all interested persons may be heard".

For purposes of this investigation, the State has been divided into major hydrographic areas. These areas, in turn, have been subdivided into hydrographic units generally comprising watersheds of individual rivers. These watersheds will be field surveyed in some detail, and, where previous detailed studies have been made, the information will be brought up to date. Water resources and water requirements will be determined and reported in a bulletin for each of the hydrographic areas. Since it requires many years to gather sufficient data to make adequate analyses of water resources and water requirements, and, in order to make the data on present land and water use available when they are most useful, surveys of land and water use will be made and published separately for each of the hydrographic units. Bulletin No. 94-1, "Land and Water Use in Tule River Hydrographic Unit", is the first of a series reporting the results of these surveys.

At a future date, estimates, largely based on the land and water use surveys, will be made of quantities of water reasonably required for future beneficial uses in each watershed. The quantity of water potentially available for export from each watershed will be determined after allowances are made for the satisfaction of the local requirements and prior rights to divert water to other areas. For those watersheds in which no exportable water is available the

water supply deficiency will be determined. These estimates will be published as they become available, in such form as to make possible a county-by-county determination.

The calculations of future water requirements will be based, in part, on predicted future land uses derived from land uses derived from land classification surveys, economic studies, population forecasts, industrial and agricultural development, and recreational needs. Agricultural water requirements will be based on unit water use by the various predicted crop types; urban and recreational requirements on per capita water use values; fish and wildlife requirements on a minimum stream flow needed or on water demands for wildlife area; and industrial water requirements on measured water deliveries to various types and sizes of industries now existing. In forecasting future industrial development, water quality problems will be given full consideration.

Water resources will be determined from records of all stream gaging stations, including new stations which were established for this and other investigations of the department. The new stations were generally constructed on streams which originate in the smaller watersheds for which runoff data are necessary but for which no data have been available. In the Tule River Hydrographic Unit, one new station was added to the existing network of stations as part of this investigation. This station was installed on the North Fork Tule River at Springville on February 14, 1957.

APPENDIX B

REPORTS ON RELATED INVESTIGATIONS
AND OTHER REFERENCES

APPENDIX B

REPORTS ON RELATED INVESTIGATIONS
AND OTHER REFERENCES

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APPENDIX C

DETAILED DESCRIPTIONS OF
CERTAIN SURFACE WATER DIVERSIONS

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DETAILED DESCRIPTIONS OF
CERTAIN SURFACE WATER DIVERSIONS

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APPENDIX C

DETAILED DESCRIPTIONS OF CERTAIN SURFACE WATER DIVERSIONS*

This appendix presents additional data on certain surface water diversions which could not adequately be presented in Table 3 of the report.

Camp Nelson Water Company (Diversion 20S/31E-27J1; Middle Fork Subunit)

Camp Nelson Water Company, now a private company, was originally organized on March 9, 1932, as a mutual water company to supply water from Belknap Creek to the summer residents of Camp Nelson. On April 12, 1932, in a transaction recorded in Book 472 of Official Records of Tulare County at page 299, the company purchased from Charles B. Smith and Emma N. Smith, successors to John W. Nelson, the right to divert from Belknap Creek the first 25 miner's inches of the Smiths' right to 100 inches of water. The latter right is based on a filing made on August 9, 1889, by John W. Nelson to divert 100 miner's inches of water from the East (now called South or Nelson) Fork of the Middle Fork Tule River. This filing is recorded in Book A of Water Rights at page 165, Tulare County Records. The remaining 75 miner's inches of this filing is now claimed by the Smiths' successor,

*Legal references herein are to Tulare County Superior Court cases described in Appendix D.

J. W. Greer, the owner of Camp Nelson Resort, who exercises this right through diversion 20S/31E-27Q1.

The Camp Nelson Water Company began diversion of water from Belknap Creek in 1932, and presently supplies water to summer homes from May 1 through October 31 of each year.

Dennison Ditch Company (Diversion 19S/30E-18R1; North Fork Subunit)

The Dennison Ditch Company is a mutual water company formed on October 4, 1924, to supply water through the former Crook, Brundage and Slocum Ditch which was first used in 1869. Upon its formation the company issued 72 shares of stock. The original directors of the company were S. H. Rockwood, F. A. Crook, Mary A. Amick, Claribel C. Gavel, and Paul F. Schowalter.

The water rights of the owners of the Crook, Brundage and Slocum Ditch have been involved in Glover v. Mitchell and Poplar Irrigation Company v. Howard. According to the earlier suit, the water right was given as 1.25 cubic feet per second, the stated capacity of the ditch. In the later suit, the owners of the ditch were decreed the right to divert 2.25 cubic feet per second. It is understood that the present claim of water right by the Dennison Ditch Company is 144 miner's inches.

Graham-Osborn Ditch (Diversion 21S/29E-2L1; Springville Subunit).

This ditch is operated on a voluntary mutual basis by various people who have acquired appropriative water rights and have arranged to convey water through a common ditch. Since the construction of the original ditch in 1871, it has been enlarged and lengthened. At the present time, there are 12 users on the ditch, the same as in 1933, the time of the last adjudication case. The names of these users are listed under Graham-Osborn Ditch in the index, Table 6.

Mt. Whitney Ditch and Water Company (Diversion 21S/29E-1B1; Springville Subunit).

On March 18, 1893, the users of the J. R. Hubbs Ditch, through which water was first diverted in about 1880, organized the Mt. Whitney Ditch and Water Company, a mutual water company having 200 shares of stock. Of the users who formed the company, Frank Conlee, J. W. Gilstrap, J. R. Hubbs, Sr., J. W. Wheeler, and C. J. Walker were elected as the first directors.

In about 1924, Tulare County obtained 25 shares of the Mt. Whitney Ditch and Water Company stock and made arrangements with the Southern California Edison Company to divert water from its Tule Powerhouse tailrace in lieu of direct

diversion from Middle Fork Tule River. This water is conveyed to the Tulare and Kings Counties Hospital through Springville Pipe. This operation is further described in the subsequent paragraph on Springville Pipe.

Pacific Gas and Electric Company (Diversions 20S/31E-7Q1, 20S/31E-18B1, 20S/31E-18D1; Middle Fork Subunit).

The Pacific Gas and Electric Company as successor to the San Joaquin Light and Power Company, operates the Tule River Powerhouse located near the junction of North (Doyle) Fork of Middle Fork Tule River and South (Nelson) Fork of Middle Fork Tule River. The powerplant began operation on January 21, 1914, with its present installed capacity of 4,800 kilowatts developed under a gross head of 1,530 feet.

Water for the powerplant is obtained from three diversions. The main diversion (20S/31E-7Q1) is made from the North Fork of Middle Fork Tule River under an appropriative water right claim of 5,000 miner's inches (100 cubic feet per second) filed by A. G. Wishon on March 7, 1911, and recorded in Book B of Water Rights at page 311, Tulare County records. The second diversion (20S/31E-18B1) is from Hossack Creek (also called Ross Creek) under a water right claim of 1,000 miner's inches filed by A. G. Wishon on October 21, 1903, and recorded in Book B of Water Rights at page 33, Tulare County records. Water from Hossack Creek is diverted directly into the main conduit. The third

diversion (20S/31E-18D1) is from Summit Meadow Springs under an appropriative application for three cubic feet per second filed under provisions of the Water Commission Act on September 22, 1919, (Application No. 1458, License No. 469). Water from these mineral springs is piped to the North Fork of Middle Fork Tule River where it is mixed with river water taken under the North Fork claim and pumped to the conduit from the main diversion.

In addition to the above appropriations, the Pacific Gas and Electric Company also holds a number of other presently unexercised rights originally filed on by A. G. Wishon on the North and South Forks of Middle Fork Tule River and their tributaries.

In the judgment Poplar Irrigation Company v. Howard, essentially the only restriction placed upon the diversion of water from the Tule River and its tributaries for power generation by the San Joaquin Light and Power Company was the requirement that all water used was to be returned to the river above Success Bridge.

Pioneer Water Company (Diversion 21S/28E-26Q1; Success Subunit).

The Pioneer Water Company is a mutual water company formed on January 13, 1888, to supply water for irrigation of lands in the vicinity of Porterville outside the Tule River Hydrographic Unit. Upon its formation, the company issued

3,600 shares of stock. Water is conveyed through Pioneer Ditch which was built by Pioneer Land Company in about 1860.

Water rights of the Pioneer Water Company have been involved in several lawsuits including Glover v. Mitchell, in which the company was decreed a water right of 72 cubic feet per second.

Pleasant Valley Canal Company (Diversion 21S/29E-11E1; Springville Subunit).

The Pleasant Valley Canal Company is successor to the Pleasant Valley Ditch Company, which was organized on November 26, 1888, as a mutual water company with 50 shares of stock. The original directors of Pleasant Valley Ditch Company were D. D. Knupp, J. L. Patterson, J. L. Hoover, J. M. McKiernan, and A. F. Thompson. Pleasant Valley Canal Company is a mutual water company which was organized with 150 shares of stock on December 19, 1924. Pleasant Valley Ditch Company was dissolved on May 19, 1926.

The Pleasant Valley Ditch was first used in about 1870, but it was not until May 10, 1888, that the owners of the ditch made an appropriative filing. The filing, recorded in Book A of Water Rights at pages 154 to 155, Tulare County records, is to divert 1,200 miner's inches of water from the Tule River. This amount was

reduced by the subsequent adjudications as indicated in Table 3. The amount of six cubic feet per second permitted by the judgment in Jones v. Pleasant Valley Canal Company comprises two and one-half cubic feet per second for users under the Wheat and Baker right referred to in that judgment, and three and one-half cubic feet per second for users under the Pleasant Valley Canal Company right. The increase of one cubic foot per second over the amount permitted under the judgment in Poplar Irrigation Company v. Howard resulted from purchase of water rights by Pleasant Valley Canal Company in the 17-year interval between the two decrees. In addition to the six cubic feet per second, the ditch is used to convey water under the claim of Hugh T. Gordon as owner of the Volney Baker appropriative right to divert "enough water to irrigate 55 acres".

South Tule Independent Ditch Company (Diversions 22S/29E-15C1; South Fork Subunit and 22S/29E-14D1; Reservation Subunit).

The South Tule Independent Ditch Company is a mutual water company organized on November 6, 1895, with 480 shares of stock to supply water through the South Tule Ditch, which was first used in 1872. The members of the original board of directors were A. Rand, W. P. Putman, H. Lees, H. C. McCabe, and H. S. Witt. Because of excessive

channel losses occurring during periods of low flow in the reach of the South Fork Tule River immediately above the original point of diversion (22S/29E-15C1), the company in 1896 began to divert water to the ditch from a second point (22S/29E-14D1) located about 0.8 mile upstream just inside the western boundary of the Tule River Indian Reservation. An agreement between the company and the Indian Reservation establishing the priority of water rights between the two parties was signed in 1922. The agreement limits diversions by the Indian Reservation in accordance with the magnitude of stream flow, as described in the subsequent discussion of Tule River Indian Reservation diversions.

The South Tule Independent Ditch Company was a party to Glover v. Mitchell and Poplar Irrigation Company v. Howard. The Glover case set the right of the company at 16 cubic feet per second which was the stated carrying capacity of the South Tule Ditch. In the Poplar Irrigation Company case, the company was decreed a right on a sliding scale of magnitude dependent upon the flow in the Tule River. The decree allows the company to divert five cubic feet per second from the South Fork Tule River when the natural flow in the Tule River at the head of Porter Slough is 100 cubic feet per second or less, 10 cubic feet per second when the Tule River flow is 100 to 500 cubic feet per second, and any amount when the Tule River flow exceeds 500 cubic feet per second.

Southern California Edison Company (Diversions 20S/30E-26D1 and 20S/30E-26D2; Middle Fork Subunit).

The Southern California Edison Company, as successor to the Globe Light and Power Company, the Mt. Whitney Power Company, and the Mt. Whitney Power and Electric Company, operates the Tule Powerhouse (also called Tule Number 4) located on the Middle Fork Tule River about two miles above Springville. The effective capacity of the plant is 2,500 kilowatts under a head of 1,140 feet. The Globe Light and Power Company began operating the powerplant on September 14, 1909, and shortly thereafter on November 8, 1909, the company was acquired by the Mt. Whitney Power Company. At the time of transfer of ownership the name was changed to the Mt. Whitney Power and Electric Company. The Mt. Whitney Power and Electric Company was conveyed to the Southern California Edison Company on June 15, 1920.

The Southern California Edison Company acquired appropriative water rights relating to the present powerplant with the above title transfers. In addition, the company acquired presently unexercised rights on the Tule River downstream from the present plant through purchase of the Tulare County Power Company by the predecessor Mt. Whitney Power and Electric Company on August 2, 1915. These rights total over 400 cubic feet per second and evidently stem from original rights of A. M. Coburn, the Tulare County Power Company, and Charles A. Elster.

Water rights for the present powerplant stem from the following original filings:

Appropriation	Filing date	File reference*	
		Book	Page
100 cfs by William H. Henley	February 5, 1902	A	415-416
100 cfs by James W. Bursell	April 7, 1902	A	426-427
100 cfs by William H. Henley	July 26, 1902	A	436-438
100 cfs by James W. Bursell	September 26, 1902	A	443-445
50 cfs by James W. Bursell	September 16, 1904	B	72-73
50 cfs by William H. Henley	September 16, 1904	B	74
2,000 miner's inches (40 cfs) by Globe Light and Power Company	November 17, 1906	B	135-140
1,000 miner's inches (20 cfs) by Globe Light and Power Company	November 17, 1906	B	141-147

*Tulare County Water Rights Records.

In addition to the above recorded water claims, the Globe Light and Power Company on September 22, 1908, made an agreement with H. E. Sicles and Charles A. and Minnie A. Elster to divert 60 cubic feet per second of the latter's claimed water right through the powerplant provided the water was delivered from the tailrace to Duncan Ditch (owned at the time jointly by Sickles and Elster). Another agreement, made in 1915 by the Mt. Whitney Power and

Electric Company, allows the company to divert into its diversion canal 2.2 cubic feet per second of water and later release this amount at Flume No. 21 to supply the Akin and Elster-Webb (Rutherford) Ditches. This measure conserves water otherwise lost to evaporation and seepage in the long natural channel of the Middle Fork Tule River between the company's intake and the Elster-Webb intake.

The above appropriations and agreements were generally upheld in Poplar Irrigation Company v. Howard, the judgment of which stated that the Mt. Whitney Power and Electric Company could divert from the North (Doyle) and the South (Nelson) Forks of Middle Fork Tule River all the flow it elects for power generation at the Tule Powerhouse, plus domestic and livestock use and watering of up to three acres of lawn and garden at the powerhouse. The case also held the rights for Duncan Ditch, Elster-Webb (Rutherford) Ditch, and Akin Ditch to be 90, 60, and 50 miner's inches, respectively, the Duncan Ditch right to be taken from the Tule River Powerhouse tailrace.

The Poplar Irrigation Company case also held the Mt. Whitney Power and Electric Company, as successor to the afore-mentioned Tulare County Power Company, had the right (presently unexercised) to divert water from the Tule River for power generation, plus domestic and livestock use and watering of up to two acres of lawn and garden at a powerhouse of unspecified location, provided the water was returned to Tule River above Success Bridge.

The Southern California Edison Company now diverts water for use at the Tule Powerhouse from two sources: diversion 20S/30E-26D1 from the South Fork of Middle Fork Tule River about 500 feet above its confluence with Middle Fork Tule River, and diversion 20S/30E-26D2 from the North Fork of Middle Fork Tule River just below the Pacific Gas and Electric Company's Tule River Powerhouse tailrace. Diversion conduits from the two sources join to form a common conduit which has a stated capacity of 37 cubic feet per second.

A further agreement affecting operations of the Southern California Edison Company is that described below under Springville Pipe.

Springville Pipe (Diversion 21S/30E-6D2; Springville Subunit).

Water for domestic and municipal uses is conveyed to the Tulare and Kings Counties Hospital in Springville and to the Springville Public Utility District from the tailrace of the Southern California Edison Company's Tule Powerhouse through "Springville Pipe".

Tulare County owns 25 shares of stock in the Mt. Whitney Ditch and Water Company to supply the Tulare and Kings Counties Hospital. By agreement dated March 12, 1924, between the Southern California Edison Company and Tulare and Kings Counties, the counties may divert a portion of the

Mt. Whitney Ditch and Water Company right through a pipe in the Tule Powerhouse tailrace. Initially, Tulare County installed a 7-inch diameter pipe and in 1947 it installed the present system consisting of 200 feet of 16-inch pipe at the tailrace, reducing to a 12-inch pipe to its water treatment plants. Water for irrigation of lawns and gardens to the hospital grounds is supplied directly from the Mt. Whitney Ditch.

The Springville Public Utility District was organized in 1924 to serve water for domestic and municipal purposes to the inhabitants of Springville, who were previously served by Avon M. Coburn.

When the Springville Public Utility District was first formed, it obtained the right to 23.5 miner's inches of water from Mr. Coburn, which amount constituted his water right of 10 miner's inches in the Coburn Ditch and one-half of his two-thirds share of the 40 miner's inches adjudicated to Walker Ditch in Poplar Irrigation Company v. Howard. Initially, the point of diversion used by the district was the same as that of the Walker Ditch, however, in 1925 Tulare County agreed to permit the district to convey 10 miner's inches of water through Springville Pipe. The district does not exercise the remaining portion of its water right at this time.

Tule River Indian Reservation (Divisions 22S/29E-12J1, 22S/30E-3M1, 22S/30E-7F1; Reservation Subunit).

Water development on the Tule River Indian Reservation started when the reservation was established in 1873. In that year a portion of the 250 acres of land under cultivation was irrigated, and by 1920, 11 ditches were in use to divert water from the South Fork Tule River for domestic, stockwatering, and irrigation purposes. In 1920, 57 acres were irrigated and 77 acres were dry-farmed. A survey made in 1935 indicated that domestic water was supplied to about 250 people, about 1,000 head of livestock were watered, and 75 acres of land were irrigated. Areas of crops comprising the latter acreage were alfalfa (4 acres), barley (46 acres), garden (22 acres), and home orchard (3 acres).

In about 1922 some of the ditches were concrete-lined and two were consolidated. The 10 remaining ditches were generally in use until the early part of World War II. In the years following the war only three ditches were used. They were Hunter or "A" Ditch (22S/30E-3M1), Chappel or "C" Ditch (22S/30E-7F1), and Agency or "E" Ditch (22S/29E-12J1).

Chappel and Agency Ditches have been used more or less continuously to the present, but Hunter Ditch was allowed to deteriorate and was last used in 1951. However, in 1958 repairs were started in anticipation of its use at the Mt. Whitney Lumber Company mill then under construction

on the reservation. In 1958 and 1959, water for the mill was obtained by temporary pipeline from the river pending completion of the repair work. The small diversions of water by Chappel and Agency Ditches in 1957 were used for domestic and stockwatering purposes and for irrigation of scattered small pastures. None of these diversions was measured in this investigation.

A 1922 agreement between Tule River Indian Reservation and the South Tule Independent Ditch Company allows the reservation to divert upstream from the company's diversion 22S/29E-14D1 on the South Fork Tule River in the amount of one, one and one-half, and two cubic feet per second when the stream flows at the company's diversion are less than three, three to five, and five to ten cubic feet per second, respectively. The reservation is allowed to divert all surplus stream flow when flow at the company's diversion is ten cubic feet per second or more.

APPENDIX D
LEGAL CONSIDERATIONS

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TABLES

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APPENDIX D
LEGAL CONSIDERATIONS

There are set forth in the following paragraphs brief general statements with respect to the California law of water rights and a review of litigation involving water rights in the Tule River Hydrographic Unit.

California Water Rights

All rights to water in California are usufructuary. They consist only in right to the beneficial use of the water. Water itself is subject to ownership only when it has been taken into actual possession. However, the owner of an usufructuary right is entitled to have the water in the surface stream flow to the point of his diversion, or to his riparian lands, without the unlawful interference by upstream diverters who have rights which are inferior to his.

Riparian and appropriative rights to surface water are recognized in California. Riparian rights are paramount until lost or impaired by grant, condemnation or prescription. Correlative rights to ground water, also recognized in California, are analogous to the riparian rights to surface waters.

All water rights, both surface and underground, are subject to the doctrine of reasonable use expressed in Section 3 of Article 14 of the State Constitution. This doctrine

limits the rights to the quantity of water reasonably required for beneficial use and prohibits waste, unreasonable use, or unreasonable methods of use or diversion.

Riparian Rights

Riparian rights are part and parcel of riparian lands, i.e., lands contiguous to a natural watercourse within a watershed. They extend only to the smallest tract, so situated, held within the continuous chain of ownership. Each riparian right is correlative with each and every other such right within the watershed. In the event of insufficient water for all, the available supply must be prorated, except that an upper riparian owner may take the whole supply if necessary for domestic use. Riparian rights extend to future reasonable requirements for beneficial use upon riparian lands.

Riparian rights do not authorize use of water on nonriparian lands, nor do they permit the seasonal storage of water. They are not created by use nor are they lost by nonuse. They do not prevent temporary appropriation by others of water not presently needed on riparian lands. The rights may be severed or lost, in whole or in part, by grant or condemnation, and they cannot thereafter be restored. A parcel of land loses its riparian right when separated from contact with a stream by conveyance, unless the right

is specifically reserved by the grantor. Riparian rights cannot be transferred for use upon another parcel of land. A riparian right may also be lost by prescription.

Riparian rights are superior to appropriative rights, except in the case of rights founded upon appropriations of water upon vacant public lands initiated before valid steps were taken to remove the riparian lands from the domain of the United States, regardless of whether the appropriative diversions and/or the lands they serve are upstream or downstream from the riparian lands.

Appropriative Rights

The miners of the early gold seeking period established the doctrine of appropriative water rights in California. Their procedure was based simply on beneficial use and required no recordation in establishing the right. The first procedure requiring recordation in perfecting an appropriative right was the Civil Code enactment of 1872. This procedure, modified several times, was in use until the Water Commission Act became effective on December 19, 1914.

The oldest of the procedures to perfect an appropriative right required simply that a diversion be made and the water be put to beneficial use. The date of the right began with its beneficial use.

The 1872 Civil Code procedure required that before a diversion of surface water could be made, a notice of intention describing the source of the water, the location of the proposed diversion, the amount to be diverted, the use and the place of use be posted at or near the place of proposed diversion. This notice was to be signed, witnessed, and a copy filed with the recorder in the county in which the proposed diversion is located. The appropriative right thus initiated became perfected when the water was put to beneficial use, but the right related back to the time the notice was posted. While the 1872 Civil Code procedure was the first to require recordation, it was not an exclusive procedure in that an appropriative right could be perfected to the extent of beneficial use simply by diverting the water and making beneficial use of it.

The Water Commission Act, on the other hand, established an exclusive procedure for the appropriation of water. This enactment requires that a permit be obtained from the State of California before water can be appropriated. The procedure outlined by the Water Commission Act, as now codified in the Water Code, requires that first an application to appropriate water be submitted to the State Water Rights Board. Upon the approval of the application, a permit is issued so that the applicant can construct the features necessary to put the water to beneficial use. When the

project has been completed, an inspection of it is made and a license is issued, to the extent of beneficial use, provided the terms and conditions of the permit have been fulfilled.

Once an appropriative water right has been initiated, it must be diligently prosecuted to completion in order to maintain its date of priority. While water may not be appropriated for a distant future use, a reasonable amount of time is allowed to put the full amount of water to use within the original intent of the application to appropriate water.

A right to appropriate water is lost by abandonment or continuous nonuse. In the case of an appropriation initiated prior to 1914, the period of continuous nonuse is five years, while under the Water Commission Act, or the Water Code, the period of continuous nonuse is only three years. Domestic use of water is the highest use and irrigation next highest use of water as provided in the Water Code.

Applications to appropriate water within the Tule River Hydrographic Unit, filed with the State since 1914 and active on August 1, 1961, are summarized in Table D-1. Those diversions, for which an application to appropriate water is filed with the State and which were found in this survey to be of significant size, have been assigned diversion numbers which are included in the table. The status of each application as to the granting of a permit or license is also shown in the table.

Ground Water Rights

The permit and license procedure established by the Water Commission Act applies only to streams and other bodies of surface water and to subterranean streams flowing through known and definite channels. Percolating ground water is therefore excluded and rights to its use are governed by judicial decisions rather than by statute. Ground waters are presumed to be percolating in the absence of evidence to the contrary.

The owner of land overlying a ground water basin or stratum has, like the riparian owner, a paramount right to the reasonable beneficial use of the natural supply upon his overlying land, which right he holds in common with all other landowners similarly situated. Only surplus water in excess of reasonable requirements for beneficial use upon overlying lands is subject to appropriation for beneficial use upon other lands. Prescriptive rights to ground water may be acquired under the same circumstances as prescriptive rights to water of surface streams.

Where ground water and surface water are interconnected, one acting as a tributary to the other, both are treated as part of a common supply and users of water from either source are entitled to protection from substantial injury as a result of use by others of water from the other source. Thus, an owner of land riparian to a stream may have

his right to the use of water protected against impairment by an appropriator of percolating ground water tributary to the stream and required for the maintenance and support of its flow. Likewise, where water from a stream percolates to a ground water basin or stratum, the owner of land overlying such ground water may be protected from an appropriation of water of the stream, if such use causes a substantial impairment of the ground water supply. As between riparian use of surface water and overlying use of ground water tributary to the stream, a sharing of the available water supply on the basis of reasonable beneficial use should be made.

Determination of Water Rights

Under provisions of the State Water Code, actions involving determinations of rights to the use of water brought in either state or federal courts may, at the court's discretion, be referred to the State Water Rights Board. Under provisions of Water Code Section 2000, the court may appoint the board to referee "any or all issues involved in the suit", or under Section 2001 it may limit the reference to "investigation of and report upon any or all physical facts involved". This reference procedure may be followed in suits involving either or both surface and ground waters.

A simplified procedure is available for adjudication of rights to the use of water of streams, lakes, and other bodies of water, but the method excludes the determination of rights to take water from an underground supply other than from a subterranean stream flowing through known and definite channels. Water Code Sections 2500 to 2900 inclusive, authorize the initiation of such a proceeding before the board. The board then makes an engineering investigation and report, holds hearings, and prepares an order of determination which is submitted to the court. After hearings, the court makes a final determination of the water rights.

Court actions which involve a determination of all the relative rights to the use of water of an entire stream or stream system and/or ground water basin afford a basis for distribution of water after decree under watermaster service. Water users may secure the services of the Department of Water Resources under Water Code Sections 4000 to 4407 inclusive, in making distribution of the water to them according to their respective rights, as determined by the court.

None of the adjudications of water rights in the Tule River Hydrographic Unit involved references to the State Water Rights Board or its predecessor agencies, nor has any State watermaster service been established.

Litigation Concerning Local Water Rights

Water rights in the Tule River Hydrographic Unit are based primarily upon riparian status and upon appropriation, as further delimited by private agreements and adjudications. Three major suits, Glover v. Mitchell (1910), Poplar Irrigation Company v. Howard (1916), and Jones v. Pleasant Valley Canal Company (1932), Tulare County Superior Court Cases Nos. 5480, 7004, and 18018, respectively, have defined the rights of a number of the present water users in the area, but the rights of each user as against each of the other users have not been determined.

The three suits involved some common parties, but a number of present water users or their predecessors were not named in any of the suits. Of the 69 diversions reported in Table 3, the owners of 14 were parties of the Glover case and 28 were parties to the Poplar Irrigation Company case, and 11 were parties to the Jones case. Technically the decreed rights apply as between plaintiff and defendants of a particular case only, and therefore the rights established by one suit do not necessarily supplement or supersede those of a previous suit. For record purposes the rights decreed to present water users or their predecessors are listed in Table 3. It may be noted that for some of the water users who were parties to more than one suit, there are variations

between the decreed entitlements. In the decree in the Glover case, the entitlements stated in Paragraph XIII differ from those in Paragraph VIII for the same parties. The difference is occasioned by specific reference in Paragraph XIII to certain appropriators who are decreed the right to make increased appropriations during a period of twenty-two days each year. The following is a brief description of the three suits and their results.

Glover v. Mitchell

This case was brought by owners of riparian lands along the Tule River west of Porterville to establish their water rights as against upstream riparians and appropriators. The decree in the case, dated May 9, 1910, establishes for the upstream riparians and appropriators their maximum allowable rates of diversion and, further, prohibits them from diverting water during the 22-day period beginning at noon on March 19 and ending at noon on April 10 of each year unless there are 400 or more second-feet flowing in the Tule River at Oettle Bridge, located about 12 miles downstream from Success Dam. Exceptions are noted for the upstream riparians and the owner of the Crabtree-Akin, Clement-Manier, Graham-Osborn and Bailey Ditches who are permitted to use water for domestic purposes and to irrigate their gardens during this period. Also excepted in the decree is the

owner of the Coburn Ditch upon whose use no restriction is placed. Apparently the present effect of this latter exception is to allow the Springville Public Utility District, as successor to a portion of the Coburn Ditch right, to continue diversion for municipal purposes during the 22-day period.

Poplar Irrigation Company v. Howard

In this case, the Poplar Irrigation Company, an appropriator diverting from the Tule River downstream from Porter Slough in the vicinity of Porterville, sued upstream riparians and appropriators to establish the relationship of their respective water rights. The decree in the case, dated September 11, 1916, establishes the diversion entitlements of the defendants as against the plaintiff when the "natural" flow in the Tule River at the head of Porter Slough is less than 500 cubic feet per second. The magnitude of water rights under the decree which are listed in Table 3, therefore, apply only under these limited flow conditions.

Jones v. Pleasant Valley Canal Company

This case was brought by the owners of the Crabtree-Akin Ditch against a group of appropriators and riparians in the vicinity of Springville to determine their relative water right priorities. A group of appropriators located downstream

from the plaintiffs entered the suit as intervenors. The judgment, dated July 31, 1933, establishes the rights of the defendants and states that they are superior to those of the plaintiffs and intervenors, except that the entitlements of defendant riparians "Jack" Fees and Robert Haenggi were subject to the right of the owners of Crabtree-Akin Ditch to divert one cubic foot per second. Entitlements of the intervenors are not stated.

APPLICATIONS TO APPROPRIATE WATER IN
TULE RIVER HYDROGRAPHIC UNIT
(Filed with State Water Rights Board as of August 1, 1961)

Application number	Date filed	Present owner	DWR diversion number	Source	Location of point of diversion					Amount	Period of diversion	Purpose	Status	
					1/4	1/4	Sec	Tp	R					B B M
1488	9/2/19	Pacific Gas and Electric Co.	209/31E-1801	Summit Meadow Creek Springs	SE	NE	13	20S	30E	MD	3.0 cfs	Jan 1-Dec 31	Power	L-469
324	2/9/11	Edis N. and N. E. Lawson	198/30E-3301	Spring tributary to Rancheria Creek tributary to Bear Creek	NW	SE	33	19S	30E	MD	0.015 cfs	Jan 1-Dec 31	Domestic and irrigation, 3 acres	L-1058
414	8/2/24	D. C. Linder, et al.	--	Nelson Creek	SE	SE	28	20S	31E	MD	0.325 cfs	Apr 1-Nov 1	Domestic and irrigation, 1 acre	L-670
4509	3/13/25	Camp Nelson Water Co.	--	Nelson Creek	SE	SE	28	20S	31E	MD	0.01 cfs	Apr 1-Nov 1	Domestic	L-1384
5541	6/20/27	Soda Flat Water Association	--	Spring tributary to Nelson Creek	SW	SW	34	20S	31E	MD	2,000 gpd	Jun 1-Sept 15	Domestic	L-1971
5546	6/15/27	Linder Hardware Co.	--	Nelson Creek	SE	SE	28	20S	31E	MD	0.201 cfs	Apr 1-Nov 1	Domestic	L-896
6880	1/3/31	Henry Matzloff, et al.	209/30E-301	Bear Creek	SW	SW	3	20S	30E	MD	0.22 cfs	Mar 15-Oct 15	Irrigation, 34 acres	L-1170
6980	6/18/31	Fred and Barbara Holstead	--	Spring tributary to South Fork of Middle Fork of Tule River	NW	SW	35	20S	31E	MD	200 gpd	May 15-Sept 15	Domestic	L-1439
7111	11/2/31	United States Juvenile National Forest	--	Spring tributary to Nelson Creek	NE	SE	34	20S	31E	MD	1,200 gpd	May 1-Nov 1	Domestic	L-1869
8137	1/19/34	United States Juvenile National Forest	--	Nelson Fork (South Fork) of Middle Fork of Tule River	NW	SW	35	20S	31E	MD	1,100 gpd	Apr 1-Nov 1	Domestic and fire protection	L-5136
8531	1-2/36	United States Juvenile National Forest	--	Nelson Fork (South Fork) of Middle Fork of Tule River	NW	SW	35	20S	31E	MD	550 gpd	May 1-Nov 1	Domestic and fire protection	L-2326
8402	8-26-38	George J. Whipple and Milton Walker	--	Tributary to North Fork of Tule River	NE	SW	7	1-3	30E	MD	7,600 gpd	Jan 1-Dec 31	Domestic and irrigation, 0.81 acres	L-4484
9415	9/17/39	United States Juvenile National Forest	--	South Fork of Middle Fork of Tule River	NW	SW	35	20S	31E	MD	100 gpd	May 1-Nov 1	Domestic and fire protection	L-2327
9416	9/17/39	United States Juvenile National Forest	--	Holbyrne Creek	NW	SW	35	20S	31E	MD	300 gpd	May 15-Nov 1	Domestic and fire protection	L-2505
9417	9/17/38	United States Juvenile National Forest	--	South Fork of Middle Fork of Tule River	SW	SW	34	20S	31E	MD	0.02 cfs	Apr 1-Dec 31	Power, domestic and fire protection	L-3128
9817	1/31/43	Berry Marlin	--	Spring tributary to Pine Creek	SW	SE	20	19S	30E	MD	2,880 gpd	Jan 1-Dec 31	Domestic	L-2931
9931	6/11/43	William P. Hensley	209/30E-301	Long Canyon Creek	NW	SW	32	20S	30E	MD	1.54 cfs	Mar 1-Dec 1	Irrigation, 43 acres	L-2828
9981	7/31/43	John Edward Bace	209/30E-301	Tributary to Bear Creek	SE	SW	34	19S	30E	MD	0.138 cfs	May 1-Sept 15	Domestic and irrigation, 12 acres	L-4743
1-370	1/24/44	United States Juvenile National Forest	--	Spring tributary to South Fork of Middle Fork of Tule River	NE	NE	8	21S	32E	MD	1,600 gpd	Jun 1-Oct 15	Domestic and recreational	L-1193
10940	1/2/45	Tulare Lake Basin Water Storage District	--	Tule River	--	NW	35	21S	28E	MD	2,000 cfs 50,000 af	Jan 1-Dec 31 Jan 1-Dec 31	Domestic, flood control and irrigation, 172,000 acres	Pending
11362	4/8/45	A. H. and Lester H. Smith	--	Nelson Creek	NE	SE	18	21S	31E	MD	750 gpd	May 1-Oct 31	Domestic and fire protection	L-4819
11904	5/27/47	Cedar Slope Mutual Water Co.	--	Marshall Creek	SE	SE	26	20S	31E	MD	0.05 cfs	Jan 1-Dec 31	Domestic	P-6941
11972	7/3/47	United States Juvenile National Forest	--	Spring tributary to South Fork of Middle Fork of Tule River	NE	NW	8	21S	32E	MD	975 gpd	Jun 1-Oct 31	Domestic and stockwatering	L-3520
12640	7/28/48	John Edward Bace	209/30E-301	Tributary to Bear Creek	NE	NW	3	20S	30E	MD	2 af	Mar 1-Apr 30	Irrigation, 13 acres	L-4647

P - Indicates permit number of application approved. L - Indicates license number of right confirmed. Incomplete - Indicates application not yet complete. Pending - Indicates application complete but not yet approved.

TABLE D-1 (continued)
 APPLICATIONS TO APPROPRIATE WATER IN
 TULE RIVER HYDROGRAPHIC UNIT
 (Filed with State Water Rights Board as of August 1, 1961)

Application number	Date filed	Present owner	DWR diversion number	Source	Location of point of diversion						Amount	Period of diversion	Purpose	Status
					1/4	1/4	Sec	Tp	R	B & M				
L-345	11/2/53	United States Sequoia National Forest	—	Bear Creek	NE	SE	3	215	31E	MD	0.0127 cfs	Apr 1-Nov 30	Domestic	P-4034
L-399	12/5/59	John Edward Bace	208/305-3E1	Spring tributary to Bear Creek	NW	SW	3	203	30E	MD	0.08 cfs	May 1-Sept 15	Irrigation, 15 acres	L-3788
L-101	3/8/51	United States Sequoia National Forest	—	Kramer Spring	NE	NE	13	195	29E	MD	520 gpd	May 1-Oct 15	Stockwatering	L-420
L-241	4/9/51	John H. and Laura H. Dilts	—	Spring tributary to Kramer Creek	NE	NE	13	195	29E	MD	7,200 gpd	May 1-Sept 15	Domestic, stockwatering and irrigation, 3 acre	L-566
L-893	3/2/52	John Edward Bace	208/305-3E1	Spring tributary to Bear Creek	SE	NE	4	203	30E	MD	0.02 cfs	May 1-Sept 15	Irrigation, 15 acres	L-449
L-799	5/5/52	John H. and Laura H. Dilts	—	Spring tributary to Kramer Creek	SE	SE	12	195	29E	MD	15,040 gpd	May 1-Sept 15	Stockwatering and irrigation, 3 acres	L-567
L-600	6/16/52	California Water Commission	—	Tule River	—	N4	35	215	28E	MD	2,350 cfs 75,000 af	Jan 1-Dec 31 Oct 1-Jul 1	Domestic, stockwatering, mining, recreational, industrial and irrigation, 647,000 acres	Incomplete
L-876	6/25/52	United States Sequoia National Forest	—	Tributary to South Fork of Middle Fork of Tule River	NE	NW	8	215	32E	MD	275 gpd	May 1-Nov 30	Domestic, recreational and stockwatering	L-4532
L-5055	10/27/52	John H. and Laura H. Dilts	—	Spring No. 1 tributary to Kramer Creek	SW	NW	7	195	30E	MD	7,200 gpd	Jan 1-Dec 31	Domestic, stockwatering and irrigation, 3 acre	P-9314
L-289	4/13/53	Bryan and Mildred Jones	199/29E-3471	Rocky Cliff Creek	SW	NW	34	195	29E	MD	45 af	Nov 15-Jan 1	Stockwatering and irrigation, 10 acres	L-4745
L-36	9/8/54	John H. and Laura H. Dilts	—	Spring tributary to Kramer Creek	SE	SE	12	195	29E	MD	3,220 gpd	May 1-Sept 15	Domestic, stockwatering and irrigation, 5 acres	L-5618
L-8663	7/20/59	Paul H. and Kathleen L. Stamm	—	Tributary to Backbone Creek	SW	SW	8	195	30E	MD	4,500 gpd	Jan 1-Dec 31	Domestic	Pending
L-284	2/20/60	Frederick O. and Claire L. Jordan	—	Tributary to Rancheria Creek	SW	NW	5	208	30E	MD	1,300 gpd	Jan 1-Dec 31	Domestic	Pending

P - Indicates permit number of application approved.

L - Indicates license number of right confirmed.

Incomplete - Indicates application not yet complete.

Pending - Indicates application complete but not yet approved.

APPENDIX E

COMMENTS ON BULLETIN NO. 94-1
"LAND AND WATER USE IN TULE RIVER HYDROGRAPHIC UNIT"
(Preliminary Edition)

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FOREWORD

In accordance with Section 232 of the Water Code, the State Department of Water Resources held a public hearing on February 7, 1963, in Springville, California, to secure comments on the preliminary edition of Bulletin No. 94-1, "Land and Water Use in Tule River Hydrographic Unit". After consideration of these comments several revisions were made in the preliminary edition.

This appendix contains the pertinent comments presented at the public hearing as well as written comments submitted to the Director of the Department of Water Resources relating to the preliminary edition of the bulletin. Also included in this appendix is a letter to participants at the public hearing regarding changes in the preliminary edition of the report as a result of comments received at the hearing.

PUBLIC HEARING
OF THE DEPARTMENT OF WATER RESOURCES

Held at Springville Memorial Building,
Springville, California, February 7, 1963

Written Statements

The opportunity to comment in writing upon the contents of the preliminary edition of Bulletin No. 94-1 was afforded to all who so desired. Statements received at and subsequent to the public hearing are included herein.

Statement of Graham Creek Ranch

Springville, California
February 7, 1963

The duty before the water board is to guard the integrity of the agriculture of this State. Few states in the union bulk so large in the farming economy of our country.

The material given out in connection with this hearing contains a number of implications of possible change in policy regarding water use; and what we want to know is: are these contemplated changes bent towards taking water away from farming uses in order to implement the further growth of city economy, with accompanying production of wealth elsewhere; or are the legal rights of farmers to be respected according to laws established over long periods of time.

There has been very genuine feeling aroused against the practice of inducing population to come in and settle where there is no water, and then undertake works to supply them from elsewhere, with someone else's legitimate water supplies.

Why is this hearing being held?

The water uses and rights of this farming community have been developed and worked out in practice over a couple of generations; and as they now stand are substantially the way local users wish them to remain.

/s/ S. H. Barton

Comments by Lower Tule River Irrigation District

April 1, 1963

Dear Mr. Warne:

Thank you for your letter of October 29, 1962, transmitting a copy of your preliminary draft of Bulletin 94-1 on Land and Water Use in the Tule River Hydrographic Unit.

The Board of Directors have requested that I convey to you their appreciation for your keeping them advised of studies in the area and commend you and your staff for a well prepared report.

We do have the following minor comments to offer: On page 15, last paragraph, the nomenclature and location of the gaging station could be further described. The station designated as Tule River near Porterville, which has been abandoned since the construction of Success Dam, was located in the Northwest quarter of Section 25, Township 21 South, Range 28 East at the old highway bridge. This is approximately 1 mile upstream from the confluence of the South Fork and about 6 miles East of Porterville. This station has been moved upstream and is now known as the Globe Bridge Station.

The station Tule River at Worth Bridge was activated in 1942-43 and does measure the entire flow from all the drainage areas of the Tule River Hydrographic Unit provided the diversion of Pioneer Ditch is included. This station, since the construction of Success Dam, has been moved upstream to a point in the channel immediately below the outlet gate of Success Dam, and is operated by the U. S. Geological Survey.

The information shown on page 16 refers to the gaging station near Porterville, as previously described, and only covers about two-thirds of the drainage area. At the bottom of page 16, 4 lines from the bottom, "river" is misspelled.

At the top of page 17, I believe it should be pointed out that the water year 1956-57 had a runoff of about 65,900 acre-feet which is about 50 percent of the long term mean of 135,400 acre-feet. The month of May was about the only month of normal runoff during the irrigation season.

At the bottom of page 17, the small water conservation reservoirs are mentioned, but we do not find them located on the maps or plates accompanying this report. If this information is available, it would be helpful to have them included as a part of the report.

On page 16, the quantities of water discussed are only from the Middle Fork and North Fork and do not take into consideration the South Fork of the Tule River which produces a part of the water supply. We would like to suggest that at the bottom of page 16 and top of page 17, the records referred to be the reconstructed record at Success Damsite. We understand the period 1903-04 to 1942-43 has been computed by the State Department of Water Resources with subsequent years being computed by U.S.C.E. using the sum of Tule River at Worth Bridge and "Diversion of Pioneer Ditch" as published in the "State of California Water Supervision Report".

On page 40 the spelling of "alphabetical" is in error.

On page 47 the estimate of 150 acre-feet of water for 210 summer homes occupied approximately three months out of the year seems a little high. On this same page the mention of agricultural reservoirs is made with no description except they are used for fishing.

Reference is made to page 80 at the bottom of the first paragraph. Here it states that the recreational potential at Success could be materially increased if a larger permanent water pool could be provided. There is no explanation as to what value the recreational potential would be and what water requirement would be necessary.

Page 85 under "Summary" it is not clear as to whether all of the agricultural land has been developed with one-fifth dry-farmed and four-fifths irrigated, or whether a portion has been developed and the above mentioned percentages determine the irrigated land and non-irrigated land.

In regards to water use and water diversions on page 85, it lists 69 diversions but there has been no listing of the farm ponds or reservoirs which are numerous in the area with many of them tying in with some of these diversions.

We hope the above comments will prove of some value to you, and should you have any comments or if you wish to discuss any of these points, we would be happy to meet with you at any time.

Yours very truly

/s/ R. L. Schafer
R. L. Schafer, Engineer
Lower Tule River Irrigation
District

Partial Transcript of Hearing

CHAIRMAN STETSON^{1/}: "...I have a series of forms that have been filled out indicating certain individuals who wish to be heard...The first is Mr. Hugh Gordon representing the Tule River Soil Conservation District and Pleasant Valley Canal Company...."

MR. GORDON^{2/}: "I would like to refer to page 17 of the report in regard to local public agencies concerned with water development and ask that there be some revision of the paragraph in regard to the Soil Conservation District in that I feel it is not complete in its statement there as to what the purposes and objectives of the district are and what the district has accomplished in terms not only of this report but of other reports and planning and so on in regard to the soil and water resources of the Upper Tule watershed".

CHAIRMAN STETSON: "Mr. Gordon, can you give us a written statement as to what you would like to include in this and to consider?"

MR. GORDON: "I couldn't today, but I will do so. Then on page 25, speaking now for the Pleasant Valley Canal Company, at the bottom of the page it says, 'In this report, references to the "miner's inch" indicate the Southern California miner's inch (1/50 cubic foot per second), the unit in common use in the Tule River area.' The Pleasant Valley Canal Company utilizes the California statute inch which is 1/40 cubic foot per second and there is a significant difference in the gallons per minute figure there and I feel that this should be noted because in terms of your report on diversions on the Pleasant Valley Ditch, if that is given in inches, why it would be a mistaken figure".

CHAIRMAN STETSON: "With regard to this one point, are there any other diversions that are under the 1/40 second-foot miner's inch term?"

^{1/} Mr. Carl L. Stetson, Chief, San Joaquin Valley Branch, Department of Water Resources.

^{2/} Mr. Hugh T. Gordon, President, Tule River Soil Conservation District; also representing Pleasant Valley Canal Company.

MR. BARTON^{1/}: "Well, the Graham-Osborn Ditch is on the northern California miner's inch standard which is 1/40".

CHAIRMAN STETSON: "Any others on this one point?"

MR. GANDY^{2/}: "Mt. Whitney Ditch and Water Company is on the same basis".

MR. BORROS^{3/}: "I think there are some others also. I think that has been the common method of measurement in this area instead of 1/50, isn't that right? The whole thing needs to be corrected".

CHAIRMAN STETSON: "We will have to review all these diversions with regard to this 1/40 or 1/50 second-foot for the miner's inch measurement. Did you have anything further, Mr. Gordon?"

MR. GORDON: "No, that is all I had. Thank you".

MR. BORROR: "I haven't been too familiar with the work that has been going on, but I do know that in the period of measurement why it wasn't done at all accurately on our particular ditch, and the fact that we do use water for additional acreage has not been mentioned in the report. I don't know what this report, what it will do to a man's water rights or anything of that kind or whether it is too important to be concerned about it".

CHAIRMAN STETSON: "This would not effect your water right. This report indicates the amount of water you used in this one particular measurement season, this one year. Do you have anything to add to that?"

MR. ILLINGWORTH^{4/}: "Perhaps we can talk to you later after we have a chance to see what is reported".

MR. BORROR: "That is what I would rather do".

1/ Mr. S. H. Barton, representing Graham Creek Ranch.

2/ Mr. W. H. Gandy, representing Mt. Whitney Ditch and Water Company.

3/ Mr. Mark L. Borrer, representing Sequoia Ranch.

4/ Mr. L. R. Illingworth, Supervising Engineer, Department of Water Resources.

MR. HODGES^{1/}: "I think part of Mr. Borrer's will answer mine on the water rights, that it will affect the water rights in no way, our present water rights, is that right? I mean the future of this thing".

MR. ILLINGWORTH: "Well, that is correct. As I mentioned earlier, this is simply a view of what was happening in this one year and we want the report to be accurate in representing that, but this one year could not in any way be used to determine what your water right is. This is based on your application, whether it is appropriation or a filing prior to the Water Commission Act or whatever other basis it has, but this is simply what was used in one year and you don't gain or lose a water right on one year's use".

MR. HODGES: "By this Table 3 when the ditch was established in 1869 it was 54 acres that were under irrigation. Well, now, there are 191 acres that are trying to irrigate under this one ditch".

MR. ILLINGWORTH: "Fifty-four acres is listed in that particular year, and then there is a footnote referring to the remarks indicating that this amount diverted was used to irrigate an additional 34 acres jointly with another diversion".

MR. HODGES: "Yes, which would be the Brundage Ditch".

MR. ILLINGWORTH: "Well, I think if you believe that this is incorrect we ought to talk about it later and check it out on the map..."

MR. STRAUSS^{2/}: "...I would like to compliment both the Soil Conservation District and the State for the preparation of the factual report which will become a very valuable reference. I am concerned, however, with the problem that presents itself as regards the date of most of the gathering of the data and the publication date of the report itself, and even though it tentatively carries a publication

1/ Mr. Hobdy Hodges, representing Dennison Ditch Company.

2/ Mr. Fred A. Strauss, Engineer, Vandalia Irrigation District and Campbell-Moreland Ditch Company.

date of March 1962, undoubtedly when this revised and set in final form it may even have a subsequent date, and I think this presents a problem in a very simple form by showing possible conflicts, for instance on I believe page 15 in the report where you make reference to the long record of low in the Tule River from 1901 to 1958, in the Tule River near Porterville, this would indicate that such record has ceased as of 1958. Although the station has been moved the record continues. I would not want to see anything put forth that might indicate a termination, you might say, of the gaging record which might mislead some parties in the future.

"Similarly there are references to the type of use under certain rights as set forth in Appendix B and I speak particularly to that which is with respect to Camp Nelson Water Company. All such use has been constant and there is water service continuously through the year rather than what is shown at the top of page C-4 where they speak of waters supplies to summer homes from May 1 to October 31.

"Similarly, I would like to ask of Hugh Gordon when he first raised the question of the use of a miner's inch in this instance, is this in the apportionment of water rights, pardon me, water use between parties or is this a reference back to the right of the ditch as measured from the main point of diversion?"

MR. GORDON: "I don't think I could answer that."

MR. STRAUSS: "I am curious as to that because in Appendix C where there have been references they are spelled out both as to second-feet and as to miner's inches, and if there were to be changes in this I think it would be imperative that any supposed changes be circulated to all parties participating here today so that such review would be comprehensive. Frankly, I think it is an excellent report, a very valuable document. I hope the comments were only constructive".

MR. BOWKER^{1/}: (Reading from a prepared statement). "We are located 1 mile below the dam on the Tule, so we are not in this report as such. I have a joint statement to make for Bowker and Company, Inc., and Victor Bowker.

1/ Mr. Victor V. Bowker, President, Bowker and Co., Inc.

"Beginning in 1901 our ranch got all its water from Tule River from direct diversion and from Campbell Moreland Ditch. More and more wells were drilled all over the whole watershed and we found less and less in the river and dug our pit deeper and deeper until once we got 40-feet deep in the edge of the river and still got very little.

"This ranch finally was forced in 1919 to drill its first well to bolster up the ever-dwindling river flow. We acquired our ranch in 1923 only to face shorter and shorter river supplies.

"In 1933 we had to save our same acreage of trees, 90 acres, by drilling a second well. An overdraft at a bank is easy to define. A scandalous and ever-increasing overdraft of river water is most glaringly obvious to any sane person.

"On our ranch we have persistently and periodically kept our riparian rights alive in the face of more and more new and newer appropriators who seem to be tolerated on the theory that there is always room for greater and greater overdrafts.

"We have a solution to this problem even though most of it cannot be straightened out at this time. A return to legality and morality might be accomplished and achieved only by early arrangement and agreement with the Central Valley Project East Side Division to purchase enough of that importable northern surplus water to replace all extra-legal and excess appropriations on Tule River. All future and potential needs should also be considered at this time.

"Any political expedient temporarily adopted yields not one acre-foot of water and only sows the dragon teeth of future water war from which only lawyers can profit while farmers agonize".

MR. BARTON: "I want to thank these gentlemen for being here with us to consider all these questions at hand. I hope that what I have to say is not time-wasting, that it has some point to it. I notice

in reading the literature that was given out, the bulletins in connection with this meeting, there were certain implications pointing towards a re-establishing of water use in this watershed, and I believe that there is certain concern, part of it expressed here this morning, on the part of the water users to protect their water rights. I feel that the water rights and water practices have been established here over many years of use and that they represent a capital investment on the part of those who have bought water, and as they say in California, you buy the water and they throw the land in.

"Now, we have had differences and conflicts in this watershed and in this hydrographic unit, but I think we have a certain common interest here in protecting the water used here because there is a disposition in this State to induce people to settle where there is no water and then undertake works to bring water from somewhere else where this water is already being used. Now, in 1907 water was brought to Los Angeles from the Owens River and at that time that water was to last forever and ever and the surplus was to be given to the farmers in the San Fernando Valley. Well, where is that water now? It is a drop in the bucket, and any kind of estimate made now for use on recreational or farm land as to future use would be just as useless as any estimate that could have been made in 1907 as to how much water Los Angeles would want. Now, the water that is taken away from our unit here and given away can never be taken back again, and who can make an estimate of what water we will need in the future. That is why I think there is the concern that was plain in the remarks made this morning, and it is a concern based on a very real consideration. Thank you".

CHAIRMAN STETSON: "Mr. Barton, you indicate that you are going to submit a written statement, is that correct?"

MR. BARTON: "Yes".

CHAIRMAN STETSON: "Thank you. Are there any others who wish to be heard? Anyone wishing to make any comment? Well, I will declare this hearing closed...Thank you all for coming".

Letter from Department of Water Resources
to Participants at Public Hearing

July 15, 1963

On February 7, 1963, a public hearing was held in Springville, Tulare County, on the adoption of findings set forth in the Department of Water Resources' preliminary edition of Bulletin No. 94-1, "Land and Water Use in Tule River Hydrographic Unit," March 1962. The findings of the bulletin were summarized and comments of the participants were received at the hearing.

This letter is to inform persons in attendance at the hearing of findings of the department upon checking major comments received.

Several of the comments questioned the validity of the statement in the report on page 25. This statement is as follows:

"In this report, reference to the 'miner's inch' indicates the Southern California miner's inch (1/50 cubic foot per second), the unit in common use in the Tule River area".

The California statute miner's inch, as defined in Chapter 222, Statutes of 1901, and codified as Section 24 of the California Water Code,

"...is equivalent to one and one-half cubic feet of water per minute, measured through any aperture or orifice".

This flow is equal to 1/40 cubic foot per second. A common definition of the miner's inch is the quantity of water flowing through a one-square-inch orifice under a prescribed head. Under a head of 6 inches the flow through the orifice would be about 1/40 cubic foot per second, or the California Statute miner's inch. Under a head of 4 inches the flow would be about 1/50 cubic foot per second.

In Bulletin 94-1, miner's inch units are used to describe established water rights only when original reference materials stated rates of water flow in such units. This was commonly the case with appropriative water right filings made prior to the enactment of the Water Commission Act of 1914. For many of these filings described in the bulletin, no indication of the specific miner's inch unit was stated in the original record, but in each case where the unit was specified it was stated as being a miner's inch under a 4-inch pressure.

Miner's inch units were also used in Tulare County Case No. 7004, Poplar Irrigation Company v. Howard. The judgment in this case was written in many segments, each of which decreed the rights of the plaintiff as against the rights of specified groups of defendants. In only one of these separate decrees, where the miner's inch was used as the measure of the rights, was the type of miner's inch specified. In this one situation the flow was specified to be "measured under a Four (4) inch pressure".

In view of the above, we conclude that the Southern California miner's inch is the unit which has been used as a measure of the water right in many, but not necessarily all, cases where the miner's inch has been used in the Tule River Hydrographic Unit.

The reference quoted on page 25 of the preliminary edition of the bulletin, has been deleted in the final edition. Conversions of miner's inches to cubic feet per second appear in the report only in cases where the type of miner's inch has been specified in the reference material.

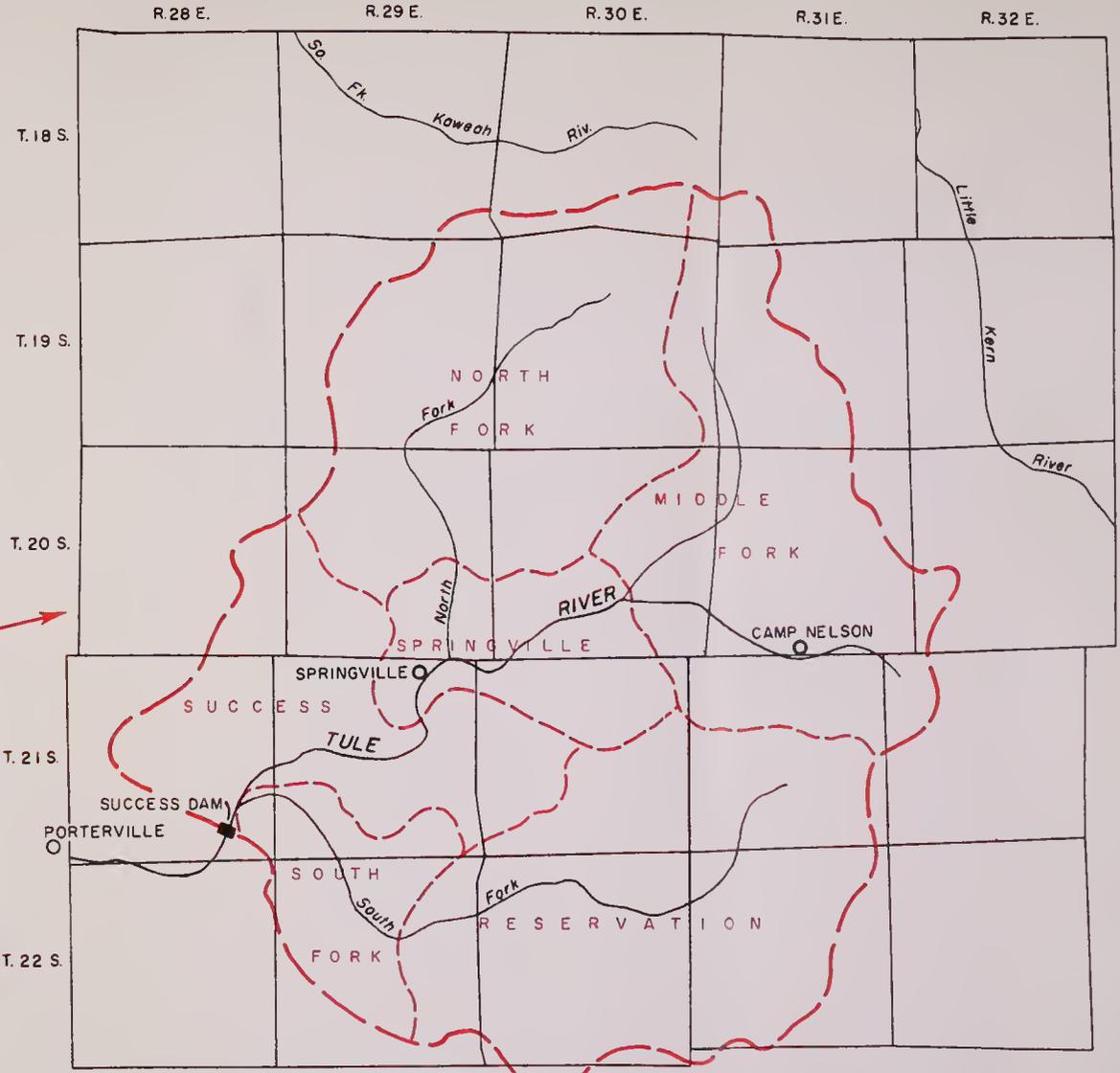
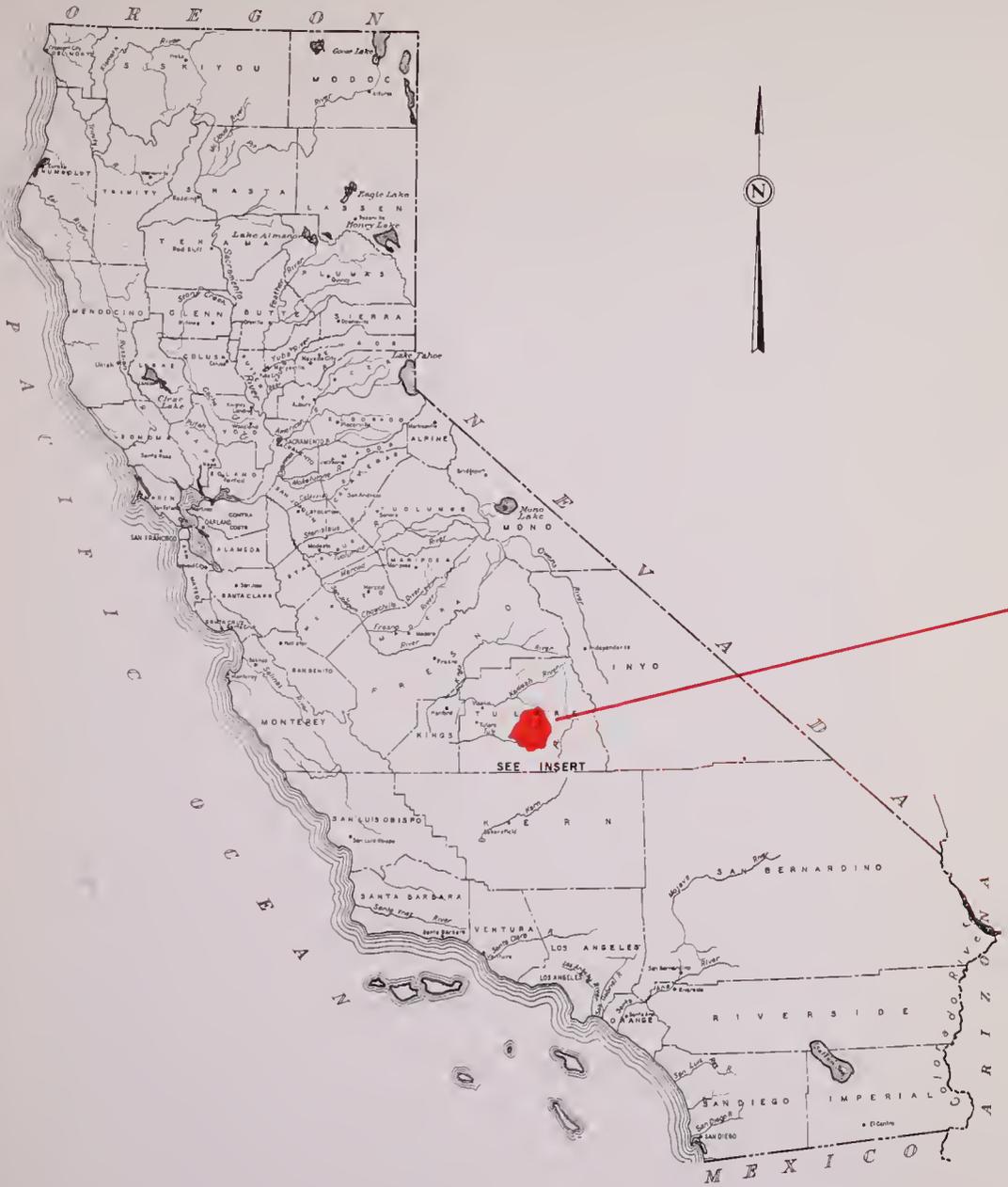
A comment was also received at the hearing concerning the sentence on page 15 which reads:

"A long record of flow in the Tule River, from 1901 to 1958, is available for the stream gaging station designated as "Tule River near Porterville".

It was pointed out that this indicates that the gaging station terminated in 1958 since the publication date of the report is 1963. Due to this possible misunderstanding the section under "Water Resources" on page 15 has been modified and now contains further information concerning major stream gaging stations in the unit.

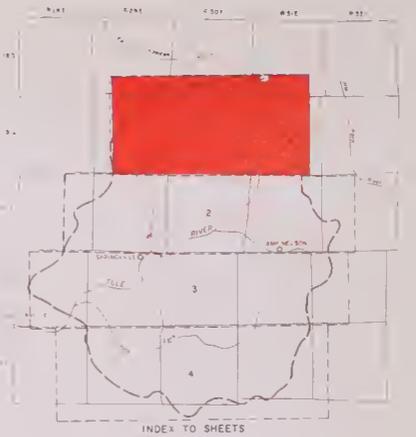
Technical changes have been made in the bulletin based on comments received at the hearing. Pertinent comments from the transcript of the hearing proceedings will be included in the bulletin which is now being prepared for final publication.

Your interest and participation at the hearing are greatly appreciated.



SUBUNITS OF TULE RIVER HYDROGRAPHIC UNIT

STATE OF CALIFORNIA
 THE RESOURCES AGENCY OF CALIFORNIA
 DEPARTMENT OF WATER RESOURCES
 SAN JOAQUIN VALLEY BRANCH
 LAND AND WATER USE
 TULE RIVER HYDROGRAPHIC UNIT
 LOCATION OF UNIT
 1962



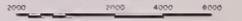
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- 14JI CAVITY DIVERSION
 - 3E4 PUMP DIVERSION
 - DIVERSION CANAL OR DITCH
 - DIVERSION PIPE
 - STEELAW GAGING STATION
 - FOREHOUSE
 - HYDROGRAPHIC UNIT BOUNDARY
 - HYDROGRAPHIC CULET BOUNDARY
 - RESERVOIR UNDER CONSTRUCTION
 - LANDS RECEIVING FULL IRRIGATION
 - LANDS RECEIVING PARTIAL IRRIGATION
 - NATURALLY IRRIGATED NOT IRL OR FALLS IN IT
 - NATURALLY IRRIGATED MEADOWLANDS
 - IRRIGATED LANDS
 - URBAN LANDS
 - RECREATIONAL LANDS

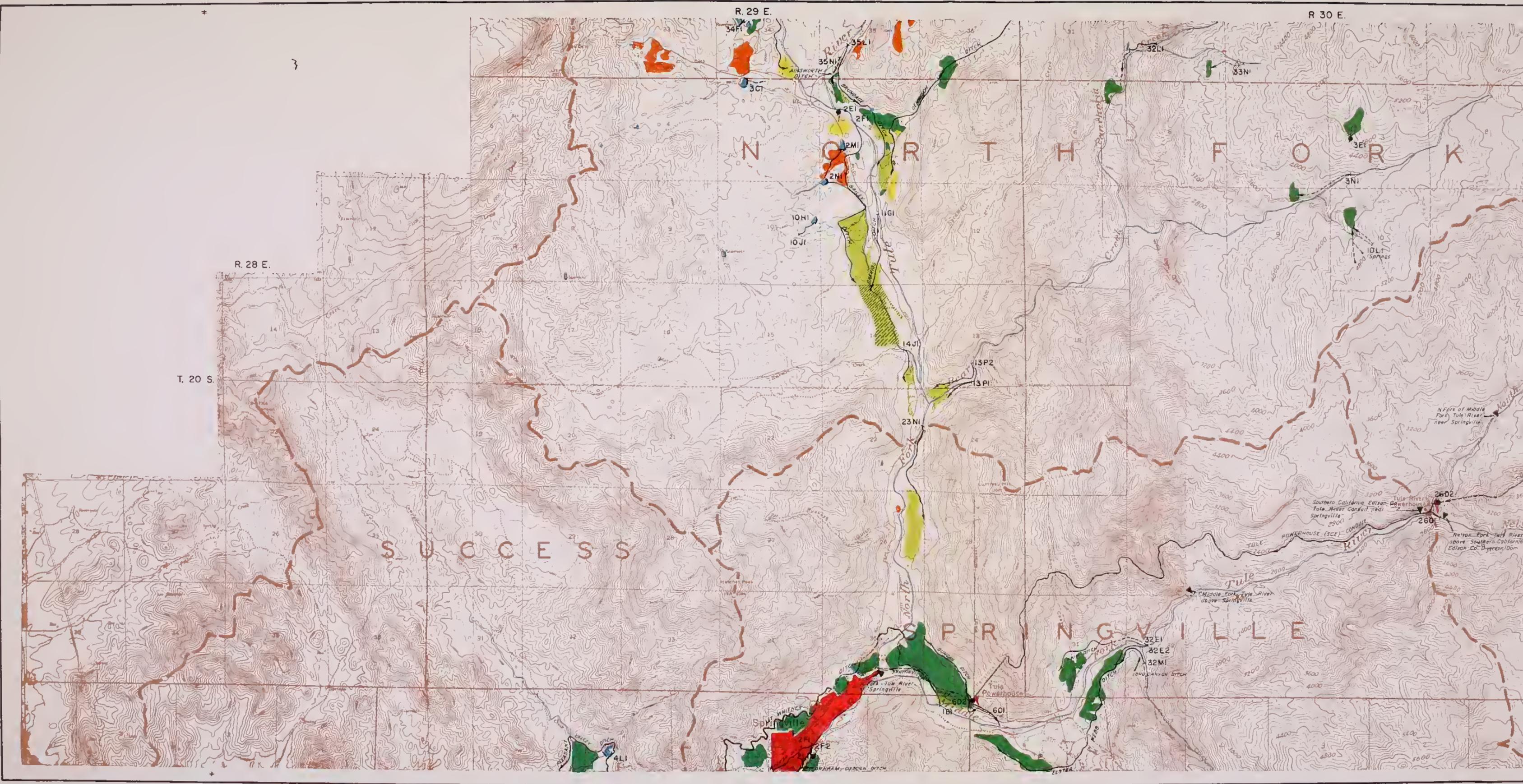
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 LAND AND WATER USE
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 1957





R. 29 E.

R. 30 E.

R. 28 E.

T. 20 S.

N O R T H F O R K

S U C C E S S E S

P R I N G V I L L E

WHITNEY

Tule River

Southern California Edison
Tule River Conduit near
Springville

Nelson Fork Tule River
above Southern California
Edison Co. Dyeing Dam

Middle Fork Tule River
above Springville

Springville

Powerhouse

2602

2601

32E1

32E2

32M1

602

601

2F1

2F2

3E1

3N1

10L1

Spring

2E1

2F1

2N1

10H1

10J1

14J1

13P2

13P1

23N1

2602

2601

32E1

32E2

32M1

602

601

2F1

2F2

3E1

3N1

10L1

Spring

2E1

2F1

2N1

10H1

10J1

14J1

13P2

13P1

23N1

2602

2601

32E1

32E2

32M1

602

601

2F1

2F2

3E1

3N1

10L1

Spring

2E1

2F1

2N1

10H1

10J1

14J1

13P2

13P1

23N1

2602

2601

32E1

32E2

32M1

602

601

2F1

2F2

3E1

3N1

10L1

Spring

2E1

2F1

2N1

10H1

10J1

14J1

13P2

13P1

23N1

2602

2601

32E1

32E2

32M1

602

601

2F1

2F2

3E1

3N1

10L1

Spring

2E1

2F1

2N1

10H1

10J1

14J1

13P2

13P1

23N1

2602

2601

32E1

32E2

32M1

602

601

2F1

2F2

3E1

3N1

10L1

Spring

2E1

2F1

2N1

10H1

10J1

14J1

13P2

13P1

23N1

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2601

32E1

32E2

32M1

602

601

2F1

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Spring

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14J1

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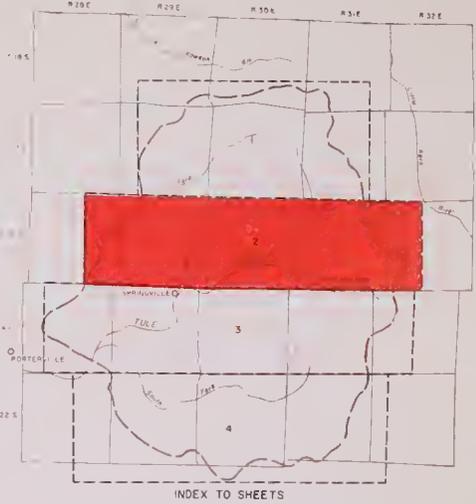
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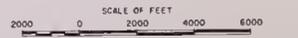
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 - POWERHOUSE
 - HYDROGRAPHIC UNIT BOUNDARY
 - HYDROGRAPHIC SUBUNIT BOUNDARY
 - RESERVOIR UNDER CONSTRUCTION
 - LANDS RECEIVING FULL IRRIGATION
 - LANDS RECEIVING PARTIAL IRRIGATION
 - LANDS USUALLY IRRIGATED BUT HOLE OR FALLOW IN 1957
 - NATURALLY IRRIGATED MEADOWLANDS
 - DRY-FARMED LANDS
 - URBAN LANDS
 - RECREATIONAL LANDS
 - LANDS IRRIGATED BY BOTH SURFACE AND GROUND WATER

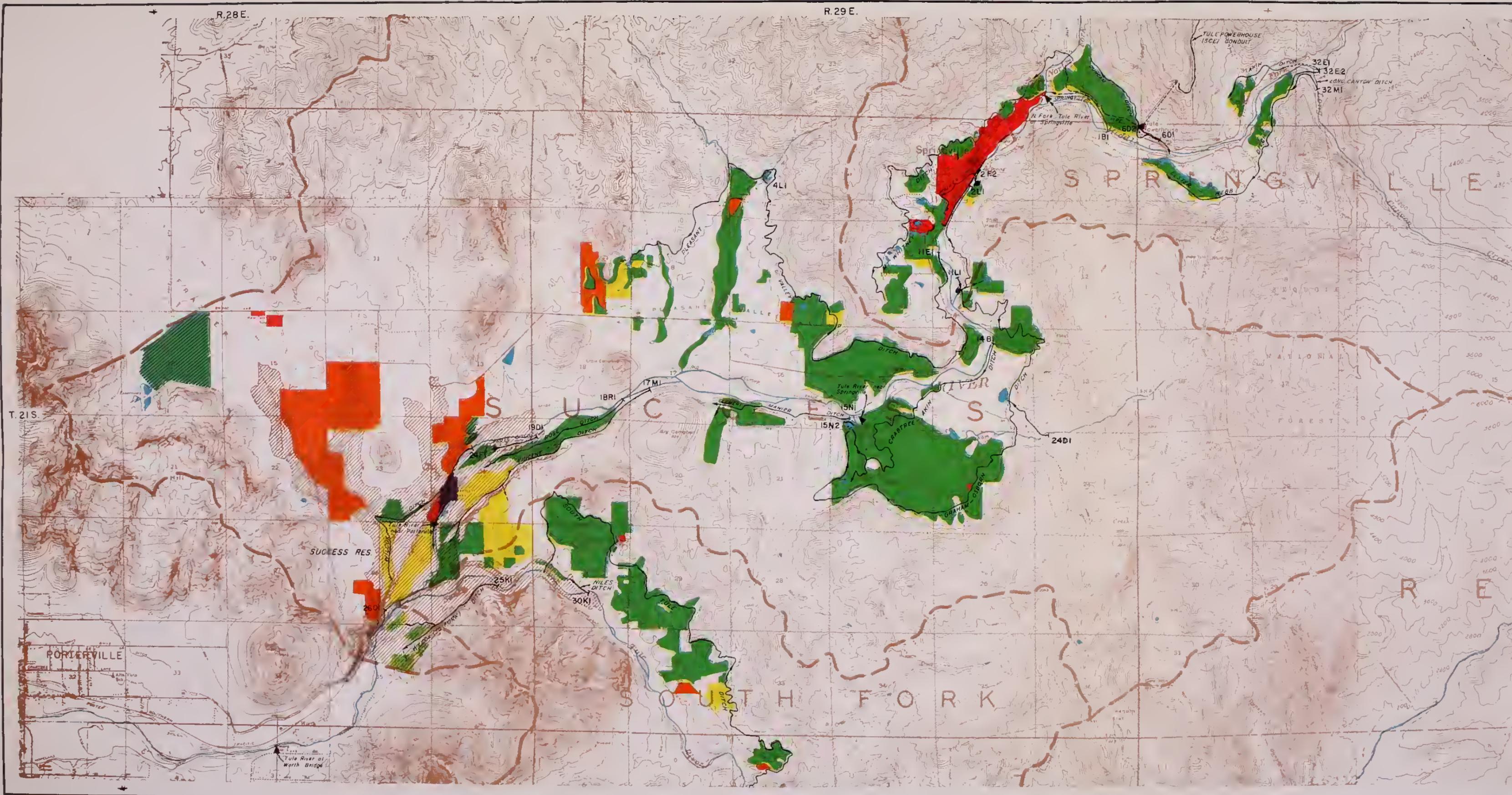
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LAND AND WATER USE
 T 20 S, R 28-32 E M 08 & M
 1957

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R. 28 E.

R. 29 E.

T. 21 S.

SPRINGVILLE

SUCLESS RES

PORTERVILLE

SOUTH FORK

Tule River at Worth Bridge

TULE POWERHOUSE (3CE) BONDUI

32E1

32E2

32MI

17MI

19DI

25KI

30KI

15NI

15N2

24DI

4LI

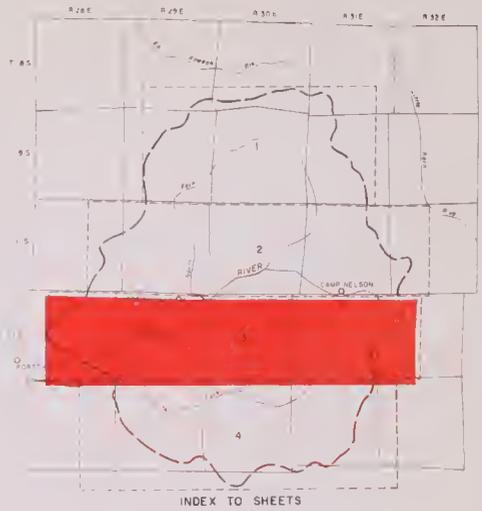
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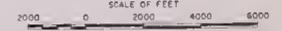
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 - DIVERSION CANAL OR DITCH
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 - POWERHOUSE
 - HYDROGRAPHIC UNIT BOUNDARY
 - HYDROGRAPHIC SUBUNIT BOUNDARY
 - RESERVOIR UNDER CONSTRUCTION
 - LANDS RECEIVING FULL IRRIGATION
 - LANDS RECEIVING PARTIAL IRRIGATION
 - LANDS USUALLY IRRIGATED BUT IDLE OR FALLING IN 1957
 - NATURALLY IRRIGATED MEADOWLANDS
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 - URBAN LANDS
 - RECREATIONAL LANDS
 - LANDS IRRIGATED BY "ROUND BAY" SYSTEM

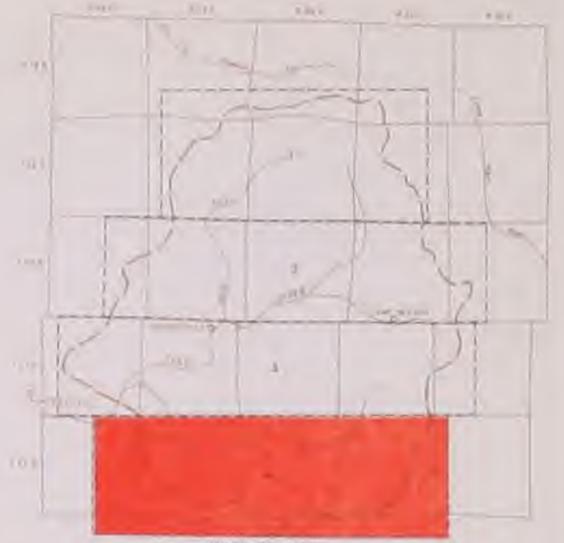
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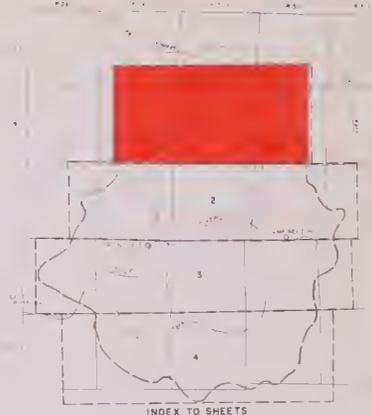
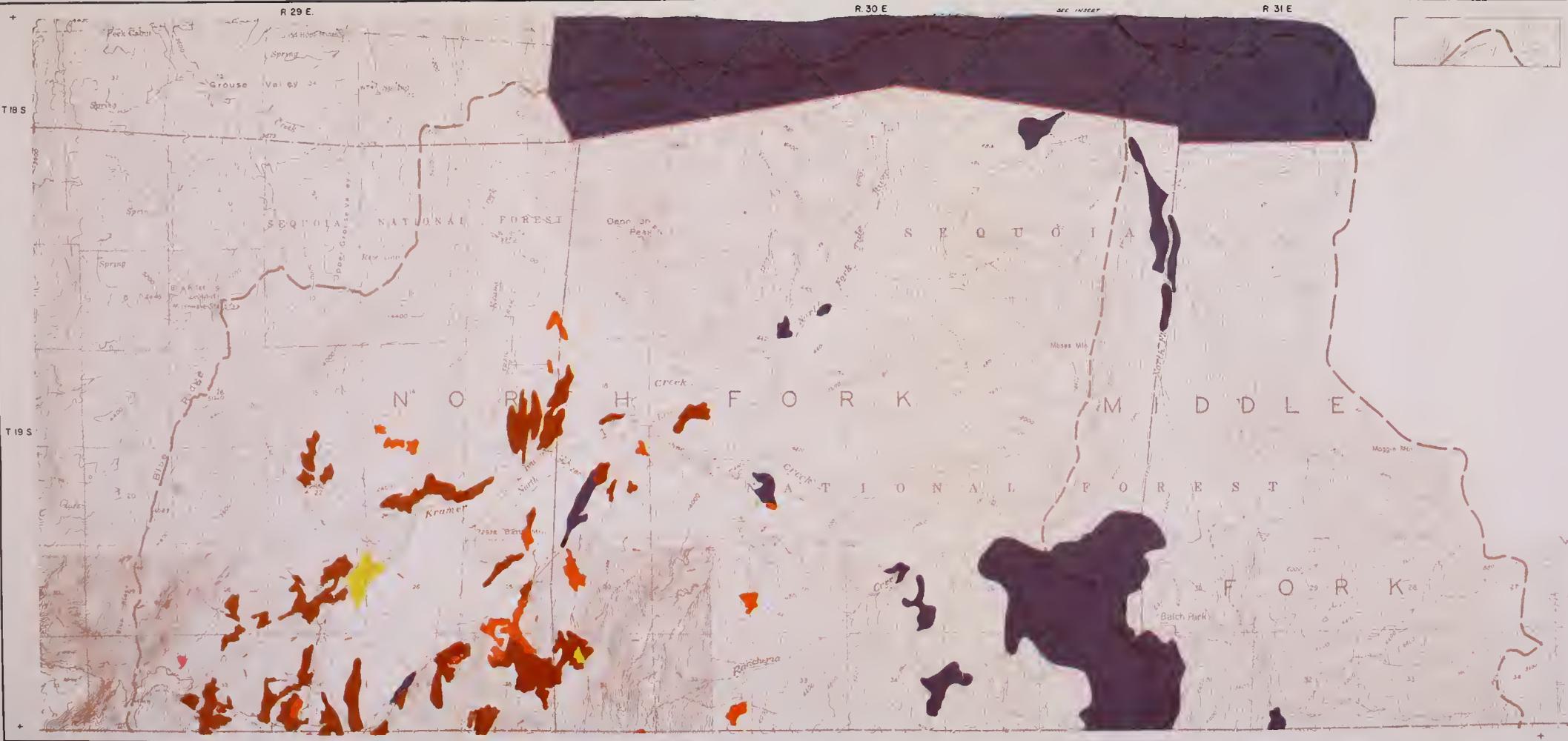
	GRAVEL BARREN		LAND TO BE REFORESTED
	PINE SILVICULTURE		LAND TO BE EXCLUDED FROM REFORESTATION
	COTTONWOOD STAND OF PINES		LAND TO BE EXCLUDED FROM REFORESTATION (ALL IN 1957)
	COTTONWOOD PINES		NATURALLY DERIVED WOODLAND
	PINE STAND OF PINES		DRY FARM LAND
	HYDROGRAPHIC INDEX BOUNDARY		GRAZING LAND
	RESERVOIR INDEX BOUNDARY		EXCAVATED LAND

KEY TO NUMBERING SYSTEM

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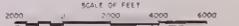
STATE OF CALIFORNIA
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 LAND AND WATER USE
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SCALE OF FEET
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- LEGEND**
- HYDROGRAPHIC OR TOPOGRAPHIC BOUNDARY
 - HYDROGRAPHIC DRAINAGE
 - RESERVOIR UNDER CONSTRUCTION
 - GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (1/2)
 - STEEPLY SLOPING OR UNDULATING IRRIGABLE LANDS (1/4)
 - PRESENT URBAN LANDS (1/1)
 - RECREATIONAL LAND (1/4)

THE STATE OF CALIFORNIA
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 LAND AND WATER USE
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CLASSIFICATION OF LANDS
 T 19 S, R 29-31 E MOBBM
 1957



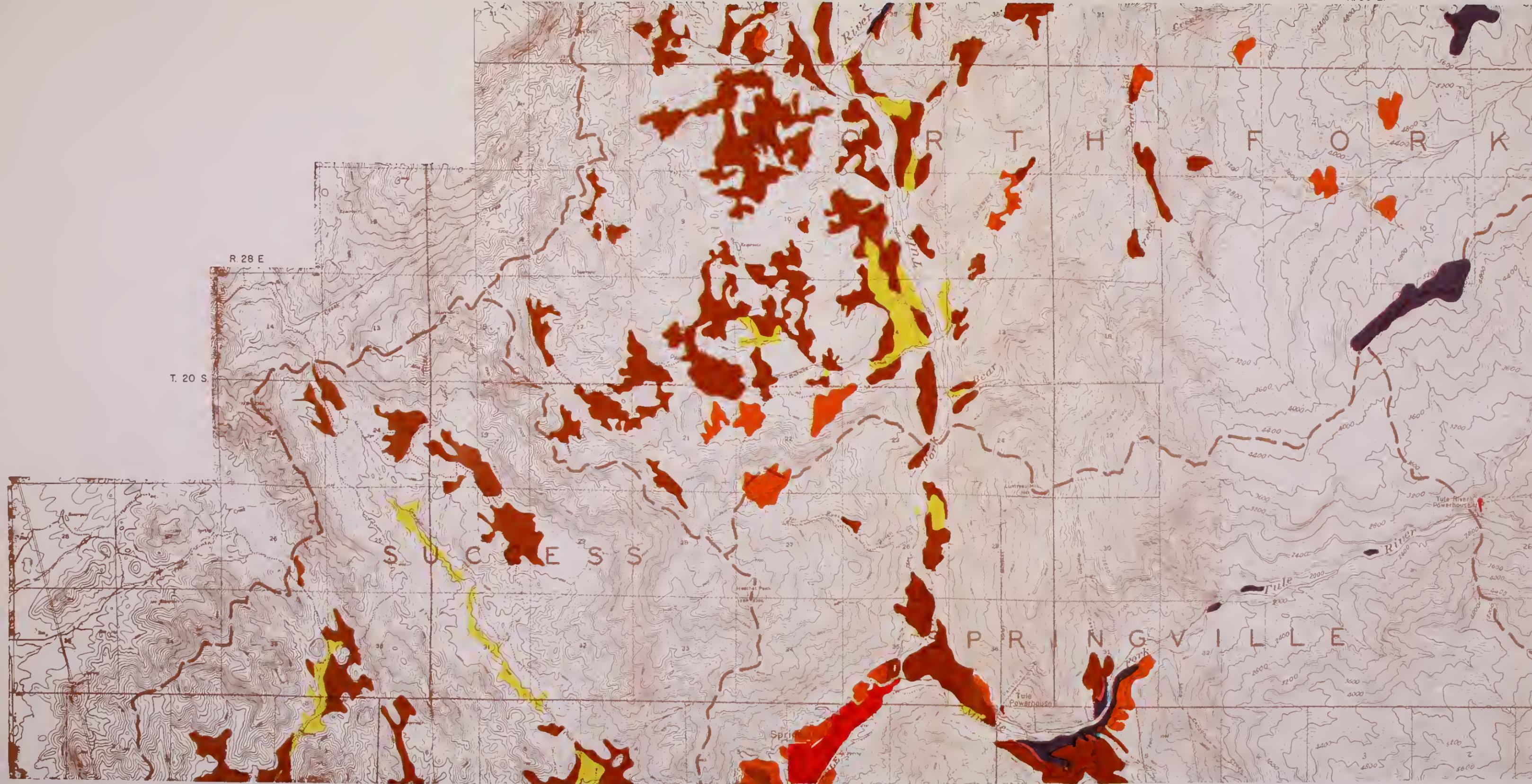
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R. 29 E.

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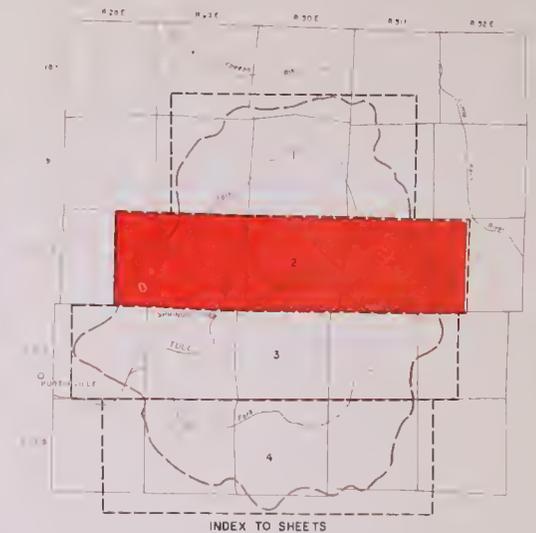
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S U C C E S S

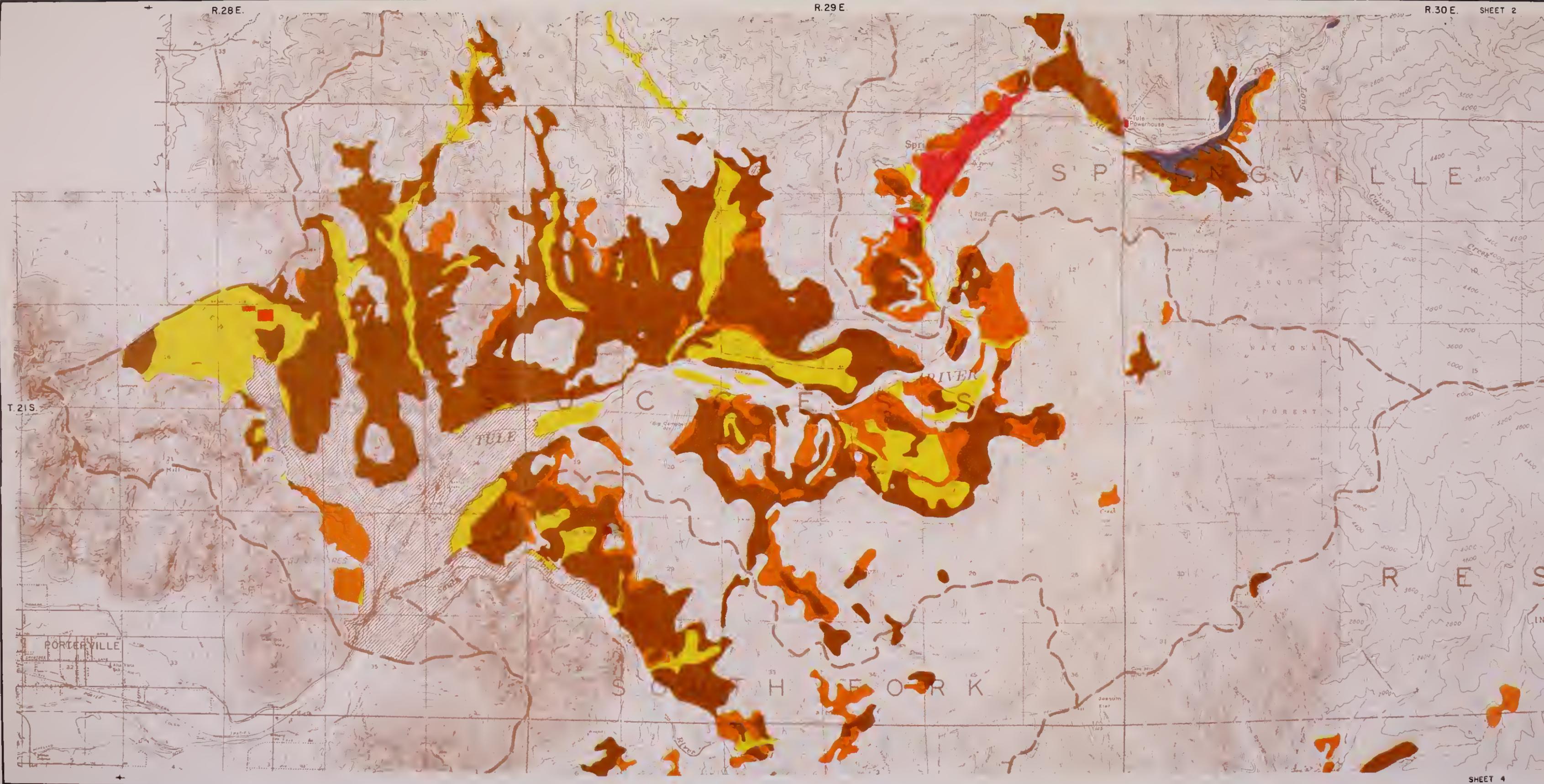
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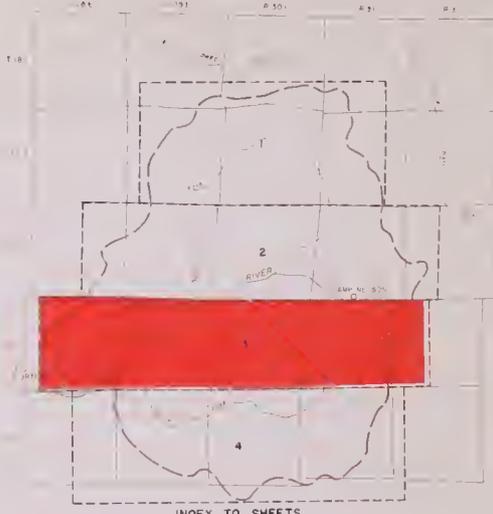


- LEGEND**
- HYDROGRAPHIC UNIT BOUNDARY
 - HYDROGRAPHIC SUBUNIT BOUNDARY
 - RESERVOIR UNDER CONSTRUCTION
 - SMOOTH LYING IRRIGABLE LANDS (W)
 - GENTLY SLOPING OR UNULATING IRRIGABLE LANDS (M)
 - STEEPLY SLOPING IRRIGABLE LANDS (H)
 - PRESENT URBAN LANDS (U)
 - RECREATIONAL LANDS (R)

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CLASSIFICATION OF LANDS
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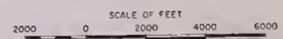


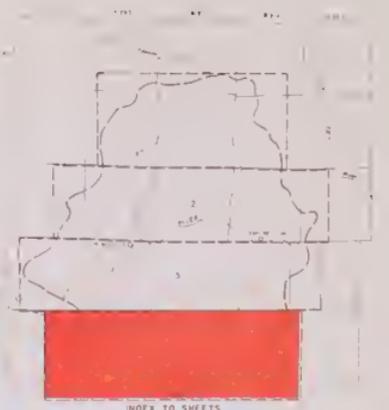
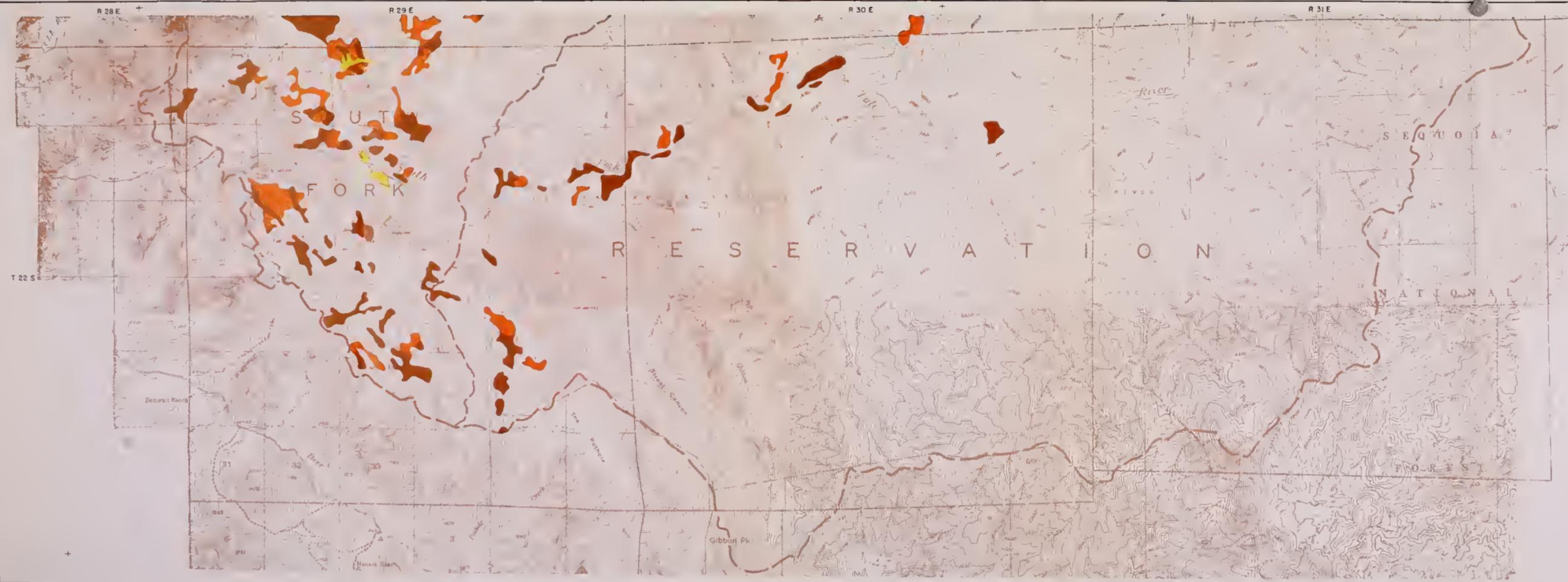


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- HYDROGRAPHIC UNIT BOUNDARY
 - HYDROGRAPHIC SUBUNIT BOUNDARY
 - RESERVOIR UNDER CONSTRUCTION
 - SMOOTH LYING IRRIGABLE LANDS (I-1)
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