

PROPOSED
IRRIGATION PROJECTS
IN
UTAH



UTAH WATER AND POWER BOARD

DECEMBER, 1948

PROPOSED IRRIGATION PROJECTS IN UTAH

A Comprehensive Report of the Proposed
Irrigation Developments in Utah

Complied under Direction of
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December, 1948

FOREWORD

This report was prepared by the Utah Water and Power Board pursuant to authority expressed by Section IV, Article 1, of Chapter 141, Laws of Utah of 1947.

The law creating the Utah Water and Power Board provides that the interests of the State of Utah require close cooperation between all State and Federal agencies, to the end that the underground waters and waters of the small streams of the State and land there under can be made to yield abundantly and increase the income and well being of the citizens of the State.

To this end, this report emphasizes the need of the smaller projects. It is the smaller projects that can be more efficiently investigated and constructed by the State and sponsoring water users. The larger and more expensive basin and stream developments will, we hope, be investigated and constructed by the United States Bureau of Reclamation.

Recognizing that fulfillment of Utah's potential growth demands forethought and long range planning, this report includes a discussion of each county's present water developments and its supplemental water requirements. It presents all the proposed small reservoir developments and the proposed diversion and conveyance improvements or replacements needed.

Alternate projects are included in order that the relative merit of all possibilities may be considered. Projects that have been reported or that are currently under investigation by the Bureau of Reclamation are mentioned, in order that a more complete picture of the ultimate development within Utah be shown.

Twenty two maps showing the location of the proposed reservoir sites, both State and Federal, are included. Also, these maps designate the lands that have an adequate supply of irrigation water, lands that require a supplemental supply of irrigation water, and irrigable lands that are included under potential irrigation developments.

Special acknowledgment is made to the State Utah Water Users Association which has so ably organized a county water users association in each of the twenty-nine counties in Utah. These organizations represent all the water users within their respective counties, and it was through their efforts that the Utah Water and Power Board was able to contact the majority of the water users representing over 668 organized irrigation companies, and an undetermined number of unorganized water users within Utah.

The Agricultural Experiment Station of the Utah State Agricultural College furnished valuable information which was used in the preparation of this report. It was through the extensive information compiled by them relative to the irrigation companies in Utah, and their irrigation needs, that we were able to assemble the required information in the listed time available.

(continued)

The greater part of the information contained herein on proposed reservoir sites was derived from previous studies made under the supervision of the State Engineer's office. The Soil Conservation Service, through its field offices, also gave valuable assistance and engineering advice on numerous proposed irrigation developments.

Acknowledgment is made to the U. S. Bureau of Reclamation, the reports of which provided the information contained herein on the proposed major irrigation developments.

Terms

Following is a list of terms that appear in this report and their definitions:

Acre-foot.- A unit of measure of volume. It is equivalent to the quantity of water that will cover 1 acre (43,560 square feet), 1 foot deep.

Second Foot.- (c.f.s.) A unit of measure of the rate of stream flow. It is the flow of 1 cubic foot (7.48 gallons) of water passing a given point per second of time. 1 c.f.s. running for 24 hours is equivalent to approximately 2 acre-feet.

Irrigable Land.- Land suitable for irrigated farming, included within an existing project or within a potential development, that reasonably could be furnished a water supply.

New Lands.- Irrigable lands which could be irrigated after project development.

Run-off.- The precipitation that appears as flow in streams. It is usually measured in volume per unit of time, such as acre-feet per day, month or year.

Return Flow.- That part of the divided stream flow returning to the stream.

Silt.- The solid matter or sediment transported by the flowing stream.

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PART I

INTRODUCTION AND SUMMARY

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4.	OTTER CREEK	51.	OAK CREEK	102.	BULLOCK DRAW
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6.	LONG PINE ENLARGEMENT	53.	BEAVER CREEK ENLARGEMENT	104.	WEST
7.	OX HOLLOW	54.	MARYSVALE	105.	LITTLE VALLEY
8.	BLUE CREEK ENLARGEMENT	55.	POINT	106.	PELICAN LAKE
9.	GEORGE CREEK	56.	CITY CREEK	107.	MINNIE MAUD
10.	ETNA SPRINGS	57.	HATCHTOWN	108.	GORDON CREEK
11.	HOT SPRINGS	58.	SPECTACLE LAKE	109.	MILLERS FLAT
12.	FOUR MILE CREEK		ENLARGEMENT	110.	SCAD VALLEY
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13.	DALTON CREEK	60.	ROUND WILLOW BOTTOM		NO. 1.
14.	DALTON CREEK	61.	UPPER GRIFFIN DRAW	112.	BLUE LAKE
15.	LAYTON	62.	BARKER ENLARGEMENT	113.	GRASSY LAKE
16.	FARMINGTON CREEK	63.	MILK RANCH	114.	DUCK FORK
17.	ECHO DITCH	64.	SWAMPS	115.	SPINNERS
18.	WALDON LAMBERT	65.	MC GARRY PARK	116.	HORSE CREEK
19.	BEAVER CREEK	66.	THREE CREEKS	117.	LITTLE BRUSH
20.	EAST FORK CHALK CREEK	67.	YELLOW MOUNTAIN		ENLARGEMENT
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	ENLARGEMENT	70.	URIE CREEK	120.	OLD EMERY ENLARGEMENT
22.	ARGENTA	71.	MEADOW HOLLOW	121.	MILL SITE
23.	PEPPER BRIDGE	72.	DEEP LAKES	122.	VALLEY CITY
24.	LITTLE WILLOW	73.	TERRY	123.	BEAVER CREEK
25.	LAKE BLANCH REPAIR	74.	CENTRAL	124.	WARNER ENLARGEMENT
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30.	LOWER BELL CANYON REPAIR	80.	SPIRIT LAKE ENLARGEMENT	130.	TEASDALE NO. 2
	ENLARGEMENT	81.	JESSEN LAKE	131.	TEASDALE NO. 3
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32.	ROSE CANYON	83.	HICKERSON PARK	133.	JOE REDD
33.	HAYSTACK LAKE	84.	LONG PARK	134.	KELLER
34.	BENCH CREEK	85.	GREEN LAKES ENLARGEMENT	135.	VEGA
35.	HOBBLE CREEK	86.	KIDNEY LAKE	136.	DRY WASH
36.	SILVER LAKE	87.	BROWN DUCK LAKE REPAIR	137.	BULL DOG CANYON
37.	SUMMIT CREEK	88.	GEM LAKE	138.	ENTERPRISE ENLARGEMENT
38.	CLOVER CREEK	89.	SUPERIOR LAKE REPAIR		
39.	VERNON CREEK	90.	NORTH STAR LAKE		
40.	POLE CREEK	91.	TUNGSTON LAKE		
41.	BEAVER DAM ENLARGEMENT	92.	SPIDER LAKE		
42.	TWIN CREEK	93.	TIMOTHY LAKES		
43.	FREEMAN ALRED	94.	CARROL LAKE		
44.	BEAVER DAM	95.	LAKE MORAINÉ		
45.	BEAVER DAM	96.	MONARCH		
46.	JET FOX REPAIR ENLARGEMENT	97.	ELBO LAKE		
47.	BLUE MEADOW	98.	WHITE ROCK LAKES		






BUREAU OF RECLAMATION PROJECTS

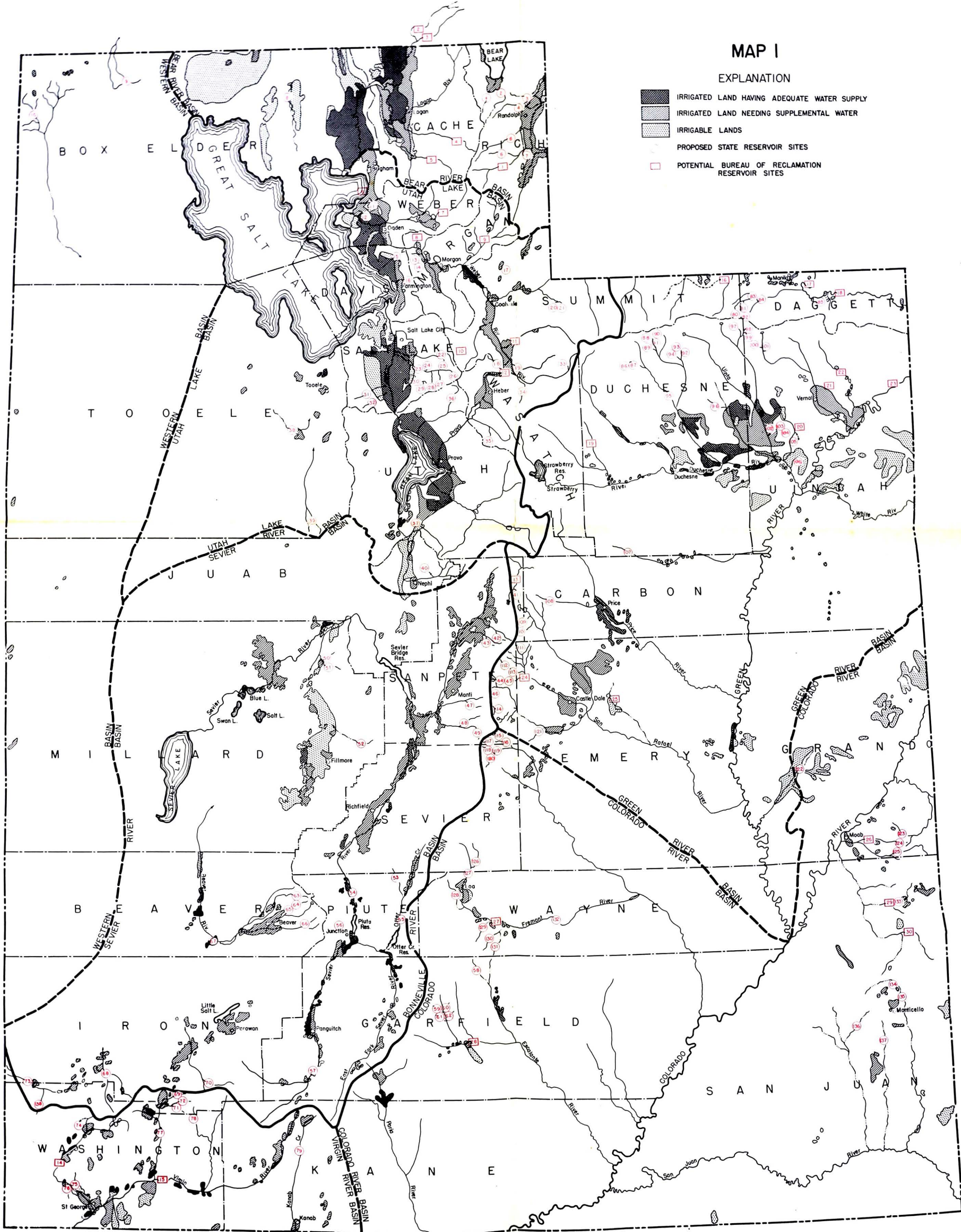
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5.	PORCUPINE	15.	VIRGIN CITY	25.	BUCKHORN
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7.	DRY CREEK	17.	FLAMING GORGE	27.	TORREY
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PROPOSED AND POTENTIAL RESERVOIR DEVELOPMENTS

MAP I

EXPLANATION

-  IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
-  IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
-  IRRIGABLE LANDS
-  PROPOSED STATE RESERVOIR SITES
-  POTENTIAL BUREAU OF RECLAMATION RESERVOIR SITES



INTRODUCTION

PURPOSE AND SCOPE

The primary purpose of this report is to present a list of the number of irrigation projects within the State of Utah required to conserve and efficiently utilize our most valuable resource--water.

Water for irrigation, for industry, and for culinary and domestic purposes must be provided to insure continued growth within Utah.

Storage is necessary for the regulation of stream flow to save the flood runoff for summer use; to furnish supplemental water to lands lacking a dependable supply; and to provide a supply to lands still undeveloped.

Improvements and extensions of our present diversion and conveyance facilities are necessary to save our existing water supply, not only to supply our present irrigated lands, but also to provide facilities for increased water supplies from storage and new diversions from other sources.

Emphasis has been placed upon the smaller projects, to the end that every mountain stream, and every water source in the State may be made to render the highest beneficial service. The smaller projects can be most efficiently investigated and constructed by the State and sponsoring water users. The larger and more expensive basin and stream developments will, we hope, be investigated and constructed by the United States Bureau of Reclamation.

Reservoir Projects.-

This report is not intended to outline each step to be taken in the construction of the proposed reservoir projects contained herein, and it is by no means contended that it has exhausted all sources of information concerning proposed reservoirs. However, it does include all of the known proposed sites which, after investigation, from preliminary reconnaissance to final studies, appear to have potentialities. No pretense is made, that all prior water rights have been thoroughly investigated. However, the possibility of conflicting water rights has received consideration in studying the proposed reservoirs with the sponsoring water users. It is generally agreed that certain proposed reservoirs would interfere with prior rights; but it is also agreed that good water storage is required to increase the efficiency and use of our water supply, especially where water is at present wasted.

Diversion and Conveyance Projects.-

This report presents the physical improvements and additions to existing distribution systems and pertinent structures necessary for conservation of existing water supplies and for securing additional storage water.

It is a recognized fact that from 25 to 40 per cent of the water diverted from the main sources of water supply is lost before finally applied to the farms.

Major factors causing these excessive losses are faulty and inadequate diversion dams, canals, limited canal capacities, poor canal alignment, lack of proper take-out gates, and inadequate measuring and diverting devices.

It was not considered necessary to analyze in this report each of the above factors, for the Department of Agriculture has issued many publications to educate the water users in the need of conserving and efficiently handling their existing water supply.

Neither is any pretense made here of having listed all the needed diversion and conveyance improvements, that exist within existing distribution systems of this state. However, this report does outline all proposed projects which were submitted during the period of our investigation.

There were some irrigation companies, mainly the large and financially independent ones, that have stated their ability to make their required improvements without the aid of the Utah Water and Power Board.

Underground Water Development.-

A brief statement is included concerning the underground water development possibilities within Utah. However, no pretense is made of having presented any over-all plan for developing this source of water supply.

MEANS OF ASSEMBLY

To obtain the information contained in this report, it was first necessary to go into each county and hold public meetings to which all water users were invited to attend. The contact medium in each county was the respective County Water Users' Associations. At the first meetings, the objectives of the survey were outlined, and a general survey sheet was given to each irrigation company or group of water users. This survey sheet served the irrigation companies as a questionnaire, and also as an information sheet.

In preparing these survey sheets, the supporting data for Bulletin 322, Irrigation Companies in Utah, published by the Utah State Agricultural Experiment Station was used. This Bulletin 322, contains the most complete available information concerning the name of each irrigation company; its source of water supply; area irrigated; estimated supplemental water requirements; length and capacity of canals; and their diversion and conveyance needs as of 1945.

The information thus obtained was copied on our survey sheet for each irrigation company. This showed the irrigation company its listed estimated needs as of 1944-45. They could then more intelligently make corrections, additions, or subtractions relative to their needs as of 1948.

At the same time, they were to consider the function and objective of the Utah Water and Power Board to assist wherever the group of water users were not able to do so without assistance.

In obtaining information on any proposed reservoir project, the files in the State Engineer's Office were first checked relative to small reservoir investigations already carried on by the State Engineer. The Twenty-second Biennial Report of the State Engineer summarizes the reservoir investigations up to 1940. Additional surveys made since then have been included in the subsequent Biennial Reports.

Each of the sites that appeared in previous reports were discussed as to present needs, with the water users in the respective areas; also, new sites proposed by the water users are included in this report.

A second meeting was held with the water users in each county, at which time their surveys were received, and their proposed storage and distribution projects were analyzed with the sponsors, engineers, and water users interested in the projects directly or indirectly.

This information gathered from the water users, Soil Conservation Service, and Agricultural Adjustment Administration officials, has been the basis of this report. Publications of the United States Bureau of Reclamation, Utah State Engineer, and the Utah State Agricultural Experiment Station were consulted in attempting to consolidate all the proposed irrigation projects into this report.

Detailed surveys are required to determine more reliable estimates, for the estimated construction costs of the respective irrigation projects are approximate, except where it is indicated that more accurate surveys have been made. The purpose of the approximate costs as listed, is to serve as a basis for a long range program of investigation and construction, which must be done for the needed irrigation projects in Utah.

SUMMARY

For use in planning a program for the comprehensive water development in Utah, this report presents 128 proposed reservoir projects, and 245 proposed diversion and conveyance projects. All are considered to lie within the range of receiving aid from appropriations available to the Utah Water and Power Board.

A number of potential reservoirs or basin developments are also outlined briefly. These have been investigated, or, are being investigated by the Bureau of Reclamation. They have been included to provide a more complete picture of the ultimate proposed development in each drainage area and county.

Of the 128 reservoir projects listed herein, 105 are listed with an estimated construction cost, leaving 23 which require more investigations, before estimated construction costs could be listed. The estimated construction cost of the 104 reservoir projects total \$6,826,000.

Of the total 245 proposed diversion and conveyance projects, 240 are listed with an estimated construction cost, leaving 5 projects requiring more investigations before preliminary cost estimates can be made. The estimated construction cost of the 240 diversion and conveyance projects total \$6,742,000.

Total estimated costs for the proposed reservoir, and diversion and conveyance projects, total - - \$13,568,000.

The total cost presented, includes the estimated construction costs of all the projects that have been constructed or that have been approved for investigation by the Utah Water and Power Board. These were presented in the First Progress Report of this Board, to the Governor of Utah, for the period May 12, 1947 to October 1, 1948.

Summary of Total Estimated Costs

Total Estimated Cost - - - - -	\$13,568,000.
Appropriations made available by 1947 Legislature - -	1,000,000.
Estimated Costs in excess of available funds - - - -	<u>\$12,568,000.</u>

Proposed Reservoir Projects

These 128 reservoir projects together with their sources of water supply, proposed capacity, estimated construction costs, where available, and areas to be benefited, are listed in Table 2. Table 3, lists a number of reservoir projects or basin developments which, if constructed, would be accomplished by the Bureau of Reclamation.

Proposed Diversion and Conveyance Projects

For the convenience of the reader, the 245 diversion and conveyance projects are summarized by county in Table 4, under one or more of the following classes:

(1) Diversion structures, include dams and diversion weirs, built for the purpose of checking the water in the river and diverting it into canals.

(2) Control structures, include headgates, spillways, waste ways, drops and chutes, measuring devices, sand and gravel gates, and sluice gates.

(3) Canal lining, to reduce seepage losses and slides, and to increase capacity, stabilizing the banks and canal bottom. With canal lining, drainage of the canal section and steep hillside banks is usually a vital part of the construction. Linings consist of many different kinds of lining: concrete, macadam, oil compounds, clay and bentonites.

(4) Pipe installation, to reduce seepage losses, or to replace canal sections that are endangered by seeps and slides.

(5) Canal construction, repairs, and alterations, includes realignment of critical canal sections, enlargement of sections, new tunnels, and improvements to prevent sidehill earth slides.

Maps

Included in this report are 22 maps, consisting of one State of Utah map, and 21 small maps showing either one county or number of counties in a river drainage area.

These maps locate each proposed reservoir site, differentiating between State and Bureau of Reclamation reservoir developments.

Each map shows classification of the lands, as either irrigated with a full water supply, irrigated needing supplemental water, and irrigable lands, which are included in a potential plan of development.

CONCLUSIONS

In presenting these needed irrigation projects, the reader must not assume that all required projects are included to fully utilize and control the small streams and other water sources within Utah.

It is the opinion of the Utah Water and Power Board that the total cost of constructing all required irrigation projects to accomplish the purpose of the act, will greatly exceed the amount listed herein.

Extended investigations are required to more completely list our needed irrigation projects, and to complete investigations of projects which have been included without cost estimates.

TABLE 2

PROPOSED RESERVOIR PROJECTS IN UTAH

STATE PROJECTS

Name of Project	Source of Water Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost\$ Total	Estimated Cost\$ Acre-Foot	Area to be Benefited Acres*
BEAVER COUNTY					
Three Creeks	Beaver River	2,023	\$122,000	75	3,500 s
McGarry Park	North Fork North Creek	400	Investigation Required		600 s
Swamps	North Fork North Creek	620	161,000	260	1,200 s
Milk Ranch	Indian Creek	366	88,000	240	700 s
Yellow Mountain	Beaver Creek	6,000	Investigation Required		2,000 n
BOX ELDER COUNTY					
Blue Creek	Blue Creek	2,158	60,000	46	3,000 s
Etna	Etna Springs	360	32,000	89	800 s
George Creek	George Creek	300	Investigation Required		700 s
Grouse Creek	Underground Water		10,000		1,200 s
CACHE COUNTY					
None					
CARBON COUNTY					
Gordon Creek	Gordon Creek	720	46,000	64	400 s
Minnie Maud	Minnie Maud	550	100,000	180	800 s
DAGGETT COUNTY					
Spirit Lake	Sheep Creek	400	5,000	50)	
Daggett Lake	Sheep Creek	433	5,000	50)	
Jessen Lake	Sheep Creek	100	5,000	50)	
Long Park	Sheep Creek	1,600	85,000	53)	4,300 s
Green Lake	Green Lake	500	15,000	50)	450 s
DAVIS COUNTY					
Farmington Creek	Farmington Creek	611	291,000	477	1,000 s

TABLE 2. PROPOSED RESERVOIR PROJECTS IN UTAH - (CONTINUED)

Name of Project	Source of Water Supply	Proposed Capacity Acre-Feet	Estimated Constr. Total	Cost\$ Acre-Foot	Area to be Benefited Acres*
UINTAH BASIN (DUCHESNE AND UINTAH COUNTIES)					
Pelican Lake	Uinta River	12,500	20,000	2	3,500 n
Whiterocks	Branches of White Rock River	1,740	50,000	29	3,000 s
Bullock Draw	Deep Creek	908	128,700	142	2,000 s
East and West	Uinta River		Investigation Required		1,000 n
Little Valley	Uinta River		Investigation Required		
Blanchett Lake	Dry Fork	500)	25,000	12	5,000 s
Twin Lakes	Dry Fork	1,500)			
North Star Lake	Yellowstone River	120	3,600	30	(75,000 s
Tungsten Lake	Yellowstone River	190	9,500	50	(
Gem Lake	Yellowstone River	250	10,000	40	(
Superior Lake	Yellowstone River	318	5,000	16	(
Brown Duck Lakes	Lake Fork River	4,900	25,000	5	(
Timothy-Carrol	Yellowstone River	1,000	40,000	40	(
Spider	Lake Fork River	100	5,000	50	(
Monarch	Dry Gulch Creek	100	2,000	20	(
Moraine	Lake Fork River	1,000	30,000	30	(
EMERY COUNTY					
Red Pine Ridge #1	Potters Creek	45	2,000	44	100 s
Blue Lake	Littles Creek	70	3,000	43	140 s
Grassy Lake	Littles Creek	140	3,000	22	300 s
Miller's Flat	Miller's Flat Creek	2,450	20,000	81	5,000 s
Scad Valley	Scad Valley Creek	577	66,000	114	1,000 s
Duck Fork	Ferron Creek	1,000	20,000	20	2,000 s
Mill Site	Ferron Creek	2,876	326,000	113	6,000 s
Beaver	Beaver Creek	200	Investigation Required		400 s
Horse Creek	Horse Creek	900	Investigation Required		1,400 s
Julius Flat	Fish Creek	900	45,000	50	1,200 s
Little Brush	Muddy River	600	30,000	50	600 s
Old Emery	Muddy River	552	7,000	12	400 s
Spinners	Muddy River	700	42,000	60	1,400 s

TABLE 2. PROPOSED RESERVOIR PROJECTS IN UTAH - (CONTINUED)

Name of Project	Source of Water Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost \$ Total	Estimated Constr. Cost \$ Acre-foot	Area to be Benefited Acres*
GARFIELD COUNTY					
Panguitch	Sevier River	13,650	Investigation Required		8,400 s
Spectacle Lake	Boulder Creek	1,348	32,000	25	3,000 s
Long Willow Bottom	North Creek	215	12,000	56	(
Round Willow Bottom	North Creek	105	10,000	96	(1,200 s
Upper Griffin Draw	North Creek	450	8,000	18	(
Barker Reservoir Enlargement	North Creek	295	12,000	41	(
GRAND COUNTY					
Warner	Mill Creek	50	5,000	100	100 s
Clark Lake	Mill Creek	51	21,100	410	70 s
Valley City	Flood Water	1,400	24,000	17	500 n
Beaver Creek	Beaver Creek	98	28,000	286	200 s
IRON COUNTY					
Blue Grass Flat	Pinto Creek	6,500	518,000	79	1,400 s
Urie Creek	Barnhurst Hollow	2,769	121,000	22	1,500 n
	Coal Creek				1,000 s
Terry	Springs	200	Investigation Required		100 n
Kanarra Creek	Kanarra Creek	40	Investigation Required		100 s
Meadow Hollow	Spring Creek	209	14,000	91	600 s
	LaVerkin Creek				
Deep Lake	Spring Creek	150	8,000	53	600 s
	LaVerkin Creek				
JUAB COUNTY					
Pole Canyon	Right Fork Pole Canyon Creek	50	5,000	100	200 s
KANE COUNTY					
Elbow	Kanab Creek	5,140	210,000	41	500 n
					1,500 s

TABLE 2. PROPOSED RESERVOIR PROJECTS IN UTAH - (CONTINUED)

Name of Project	Source of Water Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost \$ Total	Estimated Constr. Cost \$ Acre-foot	Area to be Benefited Acres*
MILLARD COUNTY					
Oak Creek	Oak Creek	300	Investigation Required		600 s
Eagle Hollow	Pioneer Creek	175	31,000	175	300 s
MORGAN COUNTY					
Dalton Creek	Dalton and Smith Creek	82	44,000	535	300 s
PIUTE COUNTY					
Beaver Creek	Beaver Creek	1,463	46,000	46	2,000 s
Panguitch	Sevier River		See Garfield County Report		
Point	Otter Creek	5,000	Investigation Required		600 s
					1,200 n
City Creek	City Creek	500	Investigation Required		500 s
RICH COUNTY					
Ox Hollow	Woodruff Creek	4,870	249,000	51	6,000 s
Long Pine	Woodruff Creek	611	50,000	147	700 s
Big Creek	Big Creek	1,000	135,000	135	4,000 s
Otter Creek	North Fork	5,400	307,000	57	2,200 s
					500 n
Sage Creek	Sage Creek	350	28,000	80	700 s
Laketown	Laketown Canyon	300	30,000	100	600 s
Creek	Creek				
Cottonwood Creek	Cottonwood Creek	350	28,000	80	600 s
SALT LAKE COUNTY					
Argenta**	Big Cottonwood	12,000	Investigation Required		
Butterfield	Butterfield Canyon				
Canyon	Creek		Investigation Required		
Lake Flora	Little Cottonwood Creek	180	12,000	100	250 s
Lake Blanch	Big Cottonwood Creek	335	17,000	50	600 s
Lower Bell	Bell Canyon Creek	245	29,900	122	500 s
Canyon					
Little Willow	Little Willow Creek		Investigation Required		600 s
Pepper Bridge	Little Cottonwood Creek	500	75,000	150	1,000 s
Rose Canyon	Rose Canyon Creek		Investigation Required		
Red Pine Lake	Little Cottonwood Creek	600	22,000	78	500 s
Upper Bell Canyon	Bell Canyon Creek	200	10,000	50	1,200 s
White Pine	Little Cottonwood Creek	200	30,000	150	400 s

TABLE 2. PROPOSED RESERVOIR PROJECTS IN UTAH - (CONTINUED)

Name of Project	Source of Water Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost \$ Total	Estimated Acre-foot	Area to be Benefited Acres*
SAN JUAN COUNTY					
Bull Dog Canyon	Bull Dog Canyon Creek	162	24,000	148	300 s
Dry Wash Ditch and Reservoir	Dry Wash	150	23,000	153	600 s
Joe Redd	West Coyote Creek	79	26,000	330	150 s
Keller	Vega Creek	500	34,000	68	500 s
Vega	North Creek-Spring Creek	1,600	56,000	35	500 n
SANPETE COUNTY					
Blue Meadow	Six Mile Creek	100	10,000	100	300 s
Blue Lakes	South Fork, Twelve Mile Creek	46	17,500	379	
	North Fork, Twelve Mile Creek	30	9,000	300	200 s
Beaver Dams	Seely Creek	56	4,000	116	200 s
Beaver Dam (Gooseberry Creek)	Gooseberry Creek	1,156	114,350	99	3,000 s
Freeman Alred	Cottonwood Creek	291	92,000	317	1,500 s
Twin Creek	Twin-Cedar Creeks	480	24,000	50	1,000 s
Jet Fox	Coal Fork Creek	1,146	45,000	39	5,000 s
SEVIER COUNTY					
Hatchtown	Sevier River	12,000	Investigation Required		14,000 s
Marysvale	Sevier River		Investigation Required		20,000 s
SUMMITT COUNTY					
Echo Ditch	Heiner Creek	400	Investigation Required		1,300 s
Beaver Creek	Beaver Creek	2,512	292,000	117	4,000 s
Walden Lambert	City Creek	70	7,000	100	140 s
East Fork Chalk Creek	Chalk Creek	354	18,000	50	700 s
TOOELE COUNTY					
Vernon Creek	Vernon Creek	900	113,000	125	700 s
Clover Creek	Clover Creek	620	225,000	363	500 s

TABLE 2. PROPOSED RESERVOIR PROJECTS IN UTAH -(CONTINUED)

Name of Project	Source of Water Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost \$ Total	Estimated Cost \$ Acre-foot	Area to be Benefited Acres*
UTAH COUNTY					
Summit Creek	Summit Creek	831	70,000	84	3,000 s 100 n
Silver Lake Flat	American Fork River	1,000	90,000	90	1,200 s
WASATCH COUNTY					
Bench Creek	Bench Creek	125	16,000	128	250 s
Hobble Creek	Little Hobble Creek	1,026	148,000	144	4,000 s
Lake Haystack	Provo River	50	5,000	100	100 s
WASHINGTON COUNTY					
Ash Creek	Ash Creek	6,600	200,000		5,000 s
Big Creek	Kolob Creek	2,241	110,500	49	1,800 s
Clay Basin Enl.	Santa Clara River	936	32,000	34	500 s
Central	Santa Clara River	250	Investigation Required		300 s
Red Cliff	Santa Clara River	1,600	175,000	109	1,300 s
Enterprise Enl.	Little Pine Creek	1,560	60,000	38	4,000 s
WAYNE COUNTY					
Road Creek Res.	Road Creek	577	34,300	59	500 s
Mill Meadow Reservoir	Fremont River	5,332	324,700	60	100 n 900 n
Teasdale Reservoir	Birch Creek				4,000 s
Forsythe Res. Enl and Repair	Boulder Creek	500	15,000	30	500 s
Keel Reservoir (Alternate) or Aldrich Reservoir	Fremont River		Investigation Required		
	Fremont River	2,000	Investigation Required		1,500 s
WEBER COUNTY					
Layton Four Mile	Kays Creek	1,357	290,000	212	30,000 s
	Weber River, Four Mile Creek	200	7,000	35	4,000 s
Hot Springs	Ogden River, Pineview Res.	200	Investigation Required		750 s
TOTAL		<u>168,799</u>	<u>\$6,826,000.</u>		<u>290,000 s</u> <u>12,300 n</u>

* s - Supplemental supply to inadequately irrigated lands.
n - Full supply to new arable lands.

** - Originally investigated by the Salt Lake City Corporation.

TABLE 3

POTENTIAL RESERVOIR PROJECTS FOR BASIN DEVELOPMENTS IN UTAH
TO BE REPORTED BY BUREAU OF RECLAMATION

Name of Project	Source of Water Supply	Proposed Capacity Acre-Feet	Area to be Benefited Acres*
<u>BOX ELDER COUNTY</u>			
Data to be published by Bureau of Reclamation		(Bear River Project)	
<u>CACHE COUNTY</u>			
Hardware	Blacksmith Fork River	20,000	3,000 s
Porcupine	East Fork Little Bear River	7,200	9,260 n
Glendale	Worm Creek Mink Creek	25,000	9,940 n
Mapleton	Cub River	23,000	50,100 s
<u>DAGGETT COUNTY</u>			
Henry's Fork	Henry's Fork	107,000	4,300 s
<u>DAVIS COUNTY</u>			
Data to be published by Bureau of Reclamation		(Weber River Project)	
<u>UINTAH BASIN, (DUCHESNE & UINTAH COUNTIES)</u>			
Data to be published by Bureau of Reclamation		(Central Utah Project)	
<u>EMERY COUNTY</u>			
Joe's Valley	Cottonwood Creek	57,000	3,300 n
Buckhorn	Huntington Creek	15,000	20,000 s 3,800 n
<u>GARFIELD COUNTY</u>			
Escalante	Escalante River Pine Creek	25,000	3,000 n
<u>GRAND COUNTY</u>			
Pack Creek	Mill Creek	3,000	1,200 n
Cisco-Thompson	Colorado River		1,250 s 87,000 n

TABLE 3. POTENTIAL BUREAU OF RECLAMATION PROJECTS - (CONTINUED)

Name of Project	Source of Water Supply	Proposed Capacity Acre-Feet	Area to be Benefited Acres*
<u>JUAB COUNTY</u>			
Data to be published by Bureau of Reclamation		(Central Utah Project)	
<u>MILLARD COUNTY</u>			
Data to be published by Bureau of Reclamation		(Central Utah Project)	
<u>MORGAN COUNTY</u>			
Lost Creek	Lost Creek	Data to be published by Bureau of Reclamation	(Weber River Project)
<u>RICH COUNTY</u>			
Woodruff Creek	Woodruff Creek	9,000	10,000 s
<u>SALT LAKE COUNTY</u>			
Data to be published by Bureau of Reclamation		(Central Utah Project)	
<u>SAN JUAN COUNTY</u>			
Hatch Creek Project:			
A. Rattlesnake	Coyote Creek	8,500)	4,000 n
B. East Canyon	East Canyon Creek	2,500)	
<u>SANPETE COUNTY</u>			
Gooseberry	Gooseberry Creek	10,200	21,800 s
<u>SUMMIT COUNTY</u>			
Jeremy	East Canyon Creek	Data to be published by Bureau of Reclamation	(Weber River Project)
<u>TOOELE COUNTY</u>			
Data to be published by Bureau of Reclamation		(Central Utah Project)	
<u>UINTAH COUNTY</u>			
Data to be published by Bureau of Reclamation		(Central Utah Project)	

TABLE 3. POTENTIAL BUREAU OF RECLAMATION PROJECTS -- (CONTINUED)

Name of Project	Source of Water Supply	Proposed Capacity Acre-Feet	Area to be Benefited Acres*
<u>UTAH COUNTY</u>			
Data to be published by Bureau of Reclamation		(Central Utah Project)	
<u>WASATCH COUNTY</u>			
Bates	Provo River	Data to be published by Bureau of Reclamation	(Central Utah Project)
<u>WASHINGTON COUNTY</u>			
Santa Clara Project (Lower Gunlock)	Santa Clara River	23,000 (14,000 active)	1,565 s
Hurricane Project (Virgin City Site)	Virgin River	165,000 (65,000 active)	14,000 n 6,500 s
<u>WAYNE COUNTY</u>			
Fremont Project-			
a. Road Creek	Road Creek	2,000	1,000 n
b. Mill Meadow	Fremont River	4,000	9,000 s
Torrey Project	(Alternate site and plan to the Keel or Aldrich Reservoir Sites)		
Torrey	Fremont River	2,000	1,200 s
<u>WEBER COUNTY</u>			
Magpie Willard Bay	Ogden River Weber River	Data to be published by Bureau of Reclamation	(Weber River Project)

* s - Supplemental supply to inadequately irrigated lands.

n - Full supply to new lands.

TABLE 4

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COSTS OF IMPROVEMENTS AND REPLACEMENTS

County	Pipe Installation		Canal Lining		Canal Constr. Repairs and Alterations		Diversion Structures		Control Structures		Total Estimated Cost	Areas to be Benefited
	Length Miles	Cost \$	Length Miles	Cost \$	Length Miles	Cost \$	No.	Cost \$	No.	Cost \$	\$	Acres
Beaver	3.0	24,000	6.0	97,000	3.0	6,000			6	3,700	130,700	8,160
Box Elder	3.2	34,500	7.0	53,000	5.0	2,700	10	1,000	18	600	91,800	9,000
Cache	0.76	10,000	18.5	270,000	21.0	29,800	4	550	75	3,600	314,000	50,185
Carbon	2.5	15,000	5.0	132,000	4.0	2,000	3	2,500	16	600	152,100	6,540
Daggett					17.65	38,000	1	5,000	1	500	43,500	4,450
Davis	1.5	25,750	29.75	355,000	2.0	14,000			14	1,000	396,000	14,500
<u>Uintah Basin</u>												
(1) Duchesne River Drainage			8.48	132,800	38.6	81,100	5	19,700	83	12,300	245,900	77,231
(2) Ashley Valley Drainage	5.0	60,000	6.75	182,900	8.0	15,900	9	37,850	29	3,950	300,600	15,885
Emery			12.5	276,000	21.8	92,500	3	5,700	13	8,700	382,900	46,450
Garfield			6.0	45,900	11.7	12,400	2	1,400	7	2,100	61,800	8,320
Grand			7.3	68,000	11.0	7,200	2	2,200	47	2,100	79,500	3,625
Iron	1.0	10,000	11.0	87,100	5.0	15,000	7	6,500	28	6,700	125,300	7,960
Juab			104.0	710,000	2.5	16,100	4	2,000	139	9,600	737,700	15,490
Kane			9.5	89,000	7.5	5,900	3	4,000	14	800	99,700	3,592
Millard	6.0	60,000	17.5	323,500	2.1	3,250	1	500	25	3,050	390,300	15,710

(18)

TABLE 4 - PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COSTS OF IMPROVEMENTS AND REPLACEMENTS (CONTINUED)

County	Pipe Installation		Canal Lining		Canal Constr. Repairs and Alterations		Diversion Structures		Control Structures		Total Estimated Cost	Areas to be Benefited
	Length Miles	Cost \$	Length Miles	Cost \$	Length Miles	Cost \$	No.	Cost \$	No.	Cost \$		
Morgan	1.0	10,000	11.4	83,000	13.6	11,050	5	3,000	34	1,450	108,500	3,730
Piute	0.25	15,000	6.0	47,500	4.1	5,100	8	36,500	41	3,600	107,700	13,058
Rich			10.5	60,000	8.5	3,500	1	700	2	800	65,000	8,663
Salt Lake	3.0	60,600	47.5	552,000	2.6	17,500	1	3,000	26	3,500	636,600	21,562
San Juan			3.0	15,000	6.7	100,000	1	1,000			116,000	5,940
Sanpete			16.9	177,520	35.6	131,250	9	17,700	109	7,550	334,000	30,965
Sevier	2.75	46,500	16.0	190,800	1.7	5,000	6	36,700	68	5,000	284,000	20,740
Summit	1.0	8,500	13.5	128,400	16.9	24,150	11	4,700	190	12,650	178,400	11,851
Tooele	15.5	168,000	16.0	162,000			3	1,500			331,500	4,000
Uintah			See Uinta Basin									
Utah			34.5	385,000	7.5	4,000	1	15,000	18	1,000	405,000	15,192
Wasatch	8.5	55,000			2.0	35,000					90,000	1,563
Washington			30.0	284,300	8.1	18,800	2	1,700	50	5,700	310,500	10,035
Wayne			7.6	10,000	10.3	13,500	1	5,600	44	5,100	34,200	9,650
Weber	12.05	135,000	3.5	12,000	25.8	20,000	2	15,500	159	6,500	189,000	12,530
TOTALS	67.0	\$737,850	465.7	\$4,929,700	304.2	\$730,700	105	\$231,500	1256	\$112,150	\$6,742,000	456,577

(19)



Fig. 1. The Marble Creek Pipe Line Project, Park Valley, Utah. Constructed under the supervision of the Utah Water and Power Board - 1948.



Fig. 2. Richmond Canal Lining Project. Section typifies lining with Gunitite Construction. Supervised by the Soil Conservation Research Division 1948.



**Fig. 3. Spectacle Lake Reservoir, Boulder, Garfield County, Utah
Showing riprap of upstream face of dam - 1948.**



**Fig. 4. Lower Bell Canyon Reservoir Dam, Salt Lake County. Typifies
dam and outlet works requiring repair or replacement.**



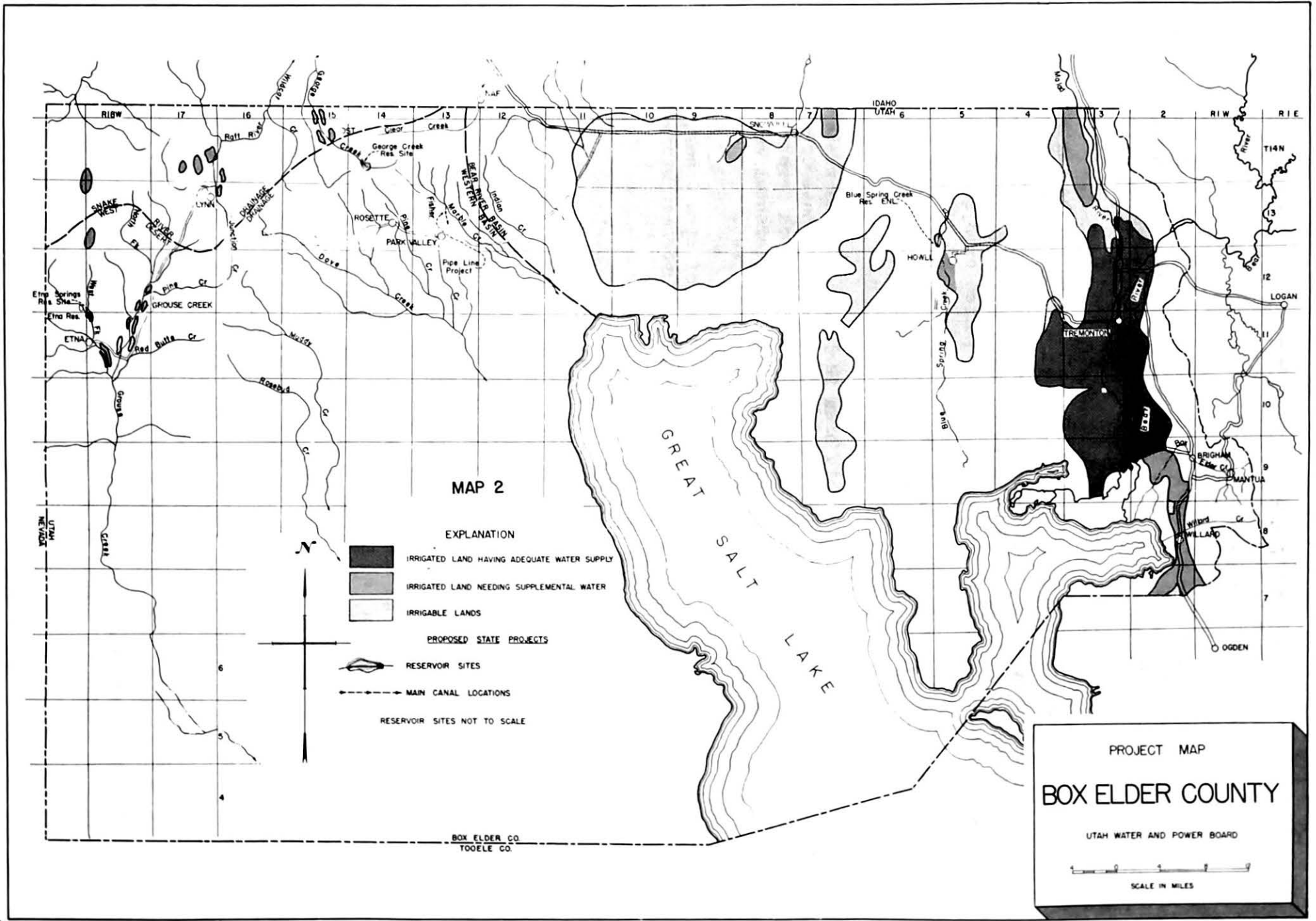
Fig. 5. West view Canal Company's Diversion Dam, diverting water from the Sevier River. Typifies needed replacement of inadequate diversion structures.



Fig. 6. Hanksville Dam Repair Project. Immediate repair of dam was imperative to prevent total failure of the structure. Looking south, dam has been repaired, with the exception of eroded area on south abutment. Construction supervised by the Utah Water and Power Board.

PART II

C O U N T Y R E P O R T S



MAP 2

EXPLANATION

- IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
- IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
- IRRIGABLE LANDS
- PROPOSED STATE PROJECTS
- RESERVOIR SITES
- MAIN CANAL LOCATIONS
- RESERVOIR SITES NOT TO SCALE

PROJECT MAP
BOX ELDER COUNTY
 UTAH WATER AND POWER BOARD

SCALE IN MILES

BOX ELDER COUNTY

Introduction

Box Elder County lies within four drainage areas. Present development of the water resources is discussed in detail under the four drainage areas: (1) Snake River, (2) West Desert, (3) Salt Lake Minor Tributaries, and (4) Bear River.

Snake River Drainage Area.- This area is located in the north east corner of Box Elder County, extending from the head waters of Raft River into Idaho. The major streams are Basin, George, and Clear Creeks, which are tributaries to the Raft River, serving about 3,700 acres of irrigated land with a supplemental water requirement estimated at 3,500 acre-feet.

The present storage development in this area consists of one reservoir with a capacity of 342 acre-feet, located on South Junction Creek serving lands in the vicinity of Lynn.

West Desert Drainage Area.- This area is located in the western part of Box Elder County, extending from the head waters of Grouse Creek south into Tooele County. The major streams are Grouse and Etna Creeks serving approximately 2,000 acres of irrigated land. The supplemental water requirements for this area are estimated at 1,500 acre-feet.

One small reservoir located at the head waters of Etna Creek, with a capacity estimated at 30 acre-feet, is the extent of present storage development in this area.

Additional sources of irrigation water has been developed from drilling wells in the Grouse Creek and Etna area. Further underground development is anticipated within this area.

Salt Lake Minor Tributaries Drainage Area.- This area includes the central portion of Box Elder County from the northern area, in the vicinity of Snowville, south to Great Salt Lake. All streams that drain directly into Salt Lake are classed within this drainage area.

The principal streams are Pine, Fisher and Marble Creeks serving the Park Valley area, Indian and Deep Creeks serving the Snowville area, Blue Creek serving the Howell area, and Willard, Box Elder, and Maple Creeks in the vicinity of Mantua, Brigham City and Willard.

Present storage development consists of four reservoirs. Blue Springs Reservoir with a capacity of 1,450 acre-feet located on Blue Creek; Curlew Reservoir with a capacity of 5,400 acre-feet located on Deep Creek in the Snowville area; Chatfield Reservoir located on a tributary to Box Elder Creek in the Brigham City area; and a portion of the Pineview Reservoir Storage serves lands along the bench north to Brigham City.

The irrigated land in this area amounts to approximately 10,000 acres, requiring an estimated supplemental supply of 4,800 acre-feet.

Bear River Drainage Area.- This area extends along the east portion of the county, including the area bordering both sides of the Bear River. Approximately 57,400 acres are irrigated in this drainage area, with the majority of this area having an adequate supply of irrigation water..

Present storage development for this area has been constructed upstream, the major storage coming from Bear Lake and the Cutler Reservoirs.

Potential New Irrigable Land Development

Underground water development by drilling shallow and deep wells properly located, could supply 2,500 acres of arable land, which lies in the Grouse Creek Valley. Also, ultimate development of the Bear River would provide a full supply to extensive areas of irrigable land located in the Curlew Valley. The Bureau of Reclamation has made preliminary studies relative to this development.

Proposed Reservoir Projects

Three reservoir projects are outlined for the development of water resources within Box Elder County. The proposed reservoir developments would provide supplemental water to 4,500 acres of land now inadequately irrigated. Each project is outlined in more detail by drainage area.

Salt Lake Minor Tributaries Drainage Area

Blue Creek Reservoir Project.- Blue Creek Irrigation Company proposes to increase the capacity of the present reservoir from 1,448 acre-feet to 2,158 acre-feet, located at a site on Blue Creek. The main purpose of this project is to reconstruct the dam to regain storage lost by siltation and to improve stability of the existing structure.

This project will insure a supplemental supply to 3,000 acres of irrigated land in the vicinity of Howell, located in Blue Creek Valley. One hundred and thirty people will be directly benefited. Engineering surveys and designs have been completed by the Soil Conservation Service, with an estimated construction cost of \$100,000. Note: The Utah Water and Power Board approved \$60,000. towards completion of this project.

West Desert Drainage Area

Etna Springs Reservoir Project.- The West Fork Grouse Creek Irrigation Company proposes a reservoir of an estimated 360 acre-feet capacity, located at an offstream site to be supplied by a feeder canal from Etna Springs. This project would provide supplemental water to approximately 800 acres in Etna Valley.

Six families would benefit from this project. Investigations are incomplete. The estimated construction cost is \$32,000. Note: This reservoir site is considered as an alternate to the enlarging of the existing Etna Reservoir. Investigations are required to determine the most feasible site.

Snake River Drainage

George Creek Reservoir Project.- The Yost Irrigation Company proposes a reservoir of 300 acre-feet capacity at a site on George Creek. This project would provide a supplemental supply to 700 acres of inadequately irrigated land in the vicinity of Yost, and would benefit approximately 150 people. Investigations of this site are required. Note: The State Engineer's office has surveyed an alternate site on George Creek, which far exceeded the economic limit, relative to capacity and respective costs.

SUMMARY

Table 5 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 5

PROPOSED RESERVOIR PROJECTS IN BOX ELDER COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost Total	Acre-foot	Area to be Benefited Acres*
<u>Salt Lake Minor Tributaries Drainage Area</u>					
Blue Creek	Blue Creek	2,158	60,000**	46	3,000 s
<u>West Desert Drainage Area</u>					
Etna	Etna Springs	360	32,000	89	800 s
<u>Snake River Drainage Area</u>					
George Creek	George Creek	300	Investigation Required		700 s
TOTAL***		<u>2,818</u>	<u>92,000</u>		<u>4,500 s</u>

* s - Supplemental supply for inadequately irrigated lands.

** Amount approved by Utah Water and Power Board towards completion of project.

*** Costs for the George Creek Reservoir not included.

Underground Water Development

A study of the possibilities of underground water development in the West Desert Drainage Area in the vicinity of Grouse Creek has been initiated. From the information gained by pumping tests, and from the geology of the basin, it is concluded that there is an abundance of

ground water which can be recovered from three different sources to be used for irrigation purposes.

The first source of water is from shallow dug or drilled wells in which the water level is from 15 to 35 feet below the surface, and the thickness of the gravel ranges from a few feet to as much as forty feet. This information has been determined by former drilling.

The second source of ground water is from the water sands and gravels in the so-called Salt Lake Formation. Wells driven into these beds have flowed and it is expected with careful drilling and gravel packing that water will flow from most of these wells.

A third source of ground water lies at the unconformable contact of the Salt Lake Formation and the older crystalline beds. No wells have yet been drilled into the lower aquifer, however, several springs yield water from this source.

It must be understood that the estimated cost for the ultimate development of this area is not practical at this point of the investigation. However, to carry this study through the investigational stage, it is estimated that if four wells were experimentally drilled for the shallow ground water source, the total cost would be approximately \$10,000.

Diversion and Conveyance Needs

There are about 35 irrigation companies in Box Elder County serving approximately 73,100 acres of irrigated land. Eleven of these companies are supplied by water from Bear River by the Utah-Idaho Sugar Company.

The distribution systems serving this area consist of approximately 91 miles of main canals with an average intake capacity of 84 c.f.s., and 16 miles of laterals which are over 4 c.f.s. capacity with an average intake capacity of 115 c.f.s.

The large capacity of the laterals is explained by the fact that companies served from the Utah-Idaho Sugar Distribution System were classed as laterals.

Results of the survey show that five irrigation companies have proposed needed distribution projects. The proposed projects consist mainly of canal lining or pipe installation to control excessive seepage losses occurring in the distribution systems.

The Marble Creek Irrigation Company received the first consideration in engineering and installation of 1.9 miles of concrete pipe with necessary structures to prevent excessive seepage losses occurring between the point of diversion from Marble Creek to the point of delivery to the irrigated lands. The estimated construction cost of the project is \$19,500.

Other irrigation companies located under the Bear River System, Park Valley Area, Yost Area and Grouse Creek Area, have indicated that their canals were losing excessive amounts of water from seepage.

Summary

Table 6 summarizes the proposed projects, showing the name of irrigation company, its source of supply, type of project, estimated construction cost, and areas to be benefited.

Table 6

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
East Grouse Creek	Grouse Creek	3 miles-canal lining) 43-control structures) 5 miles-cleaning and enlargement)	19,300	Prel. Est.	1,200
Fisher Creek	Fisher Creek	7,000 ft. - pipe)	14,000	"	1,300
George Creek	George Creek ^(*)	2½ miles-canal lining)	26,000	"	2,300
Mantua Town Corporation	Maple and Dam Springs	1.5 miles-canal lining) 15-control structures)	13,000	"	500
Marble Creek ^(**)	Marble Creek	9,905 ft.-pipe installation)	19,500	Complete	2,600
TOTAL			\$91,800		9,000

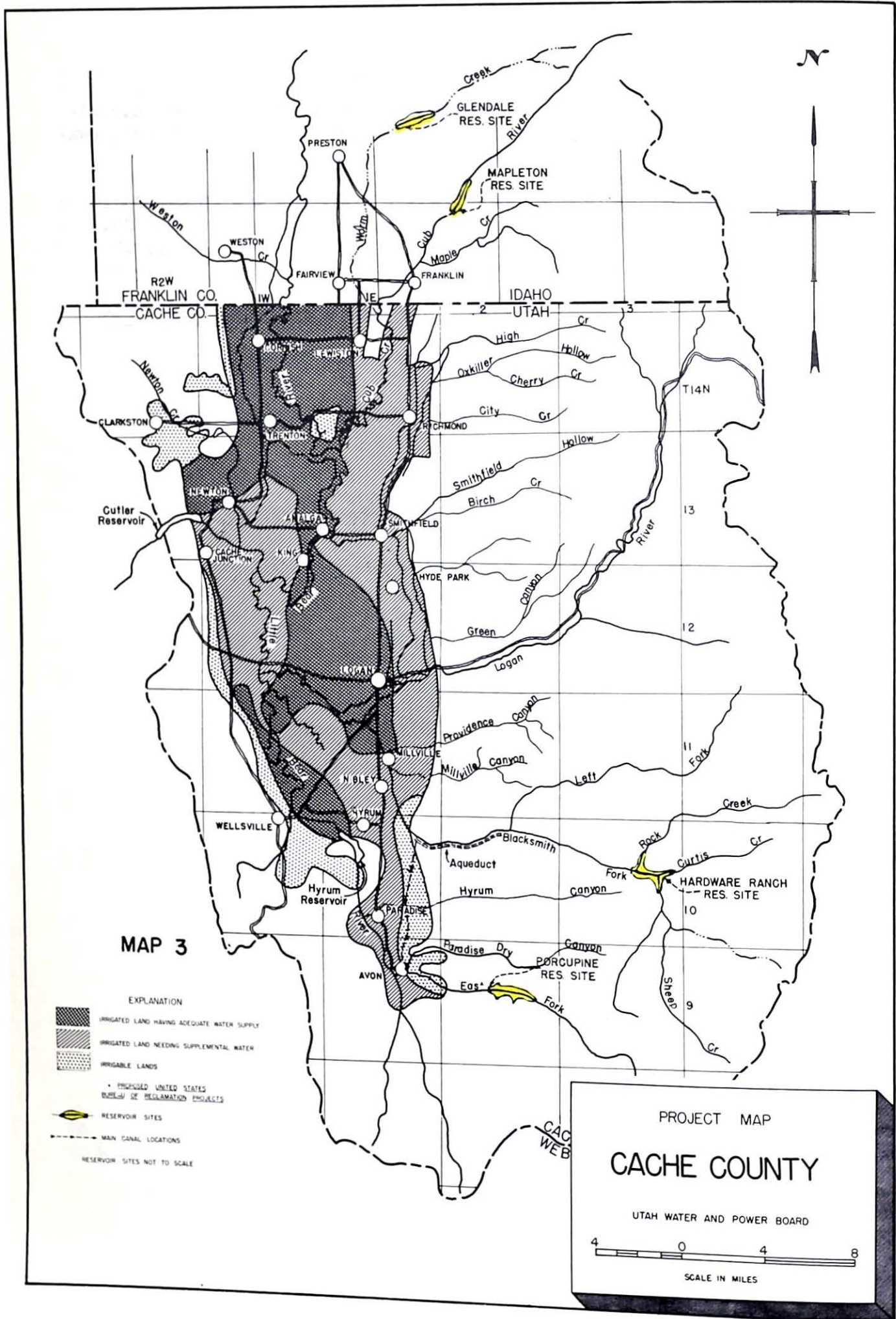
* Extensive measuring along canal is required to determine the amount of loss, and to localize the extent of the seepage losses. Measuring devices were installed in 1948 by irrigation company.

** Approved for construction in summer of 1948.

Box Elder County Summary

Box Elder County's total estimated cost for the proposed distribution and storage development and underground water development, (exclusive of major Bureau of Reclamation Projects).

(1)	Reservoir Projects - - - - -	\$ 92,000.
(2)	Diversion and Conveyance Projects- - - - -	91,800.
(3)	Underground Water Development- - - - -	10,000.
		<hr/>
	TOTAL	<u>\$ 193,800.</u>



C A C H E C O U N T Y

Introduction

Cache County lies entirely within the Bear River drainage area. The principal stream is the Bear River with the major tributaries from north to south being Cub River, High Creek, Summit Creek, Clarkston Creek, Logan River, Blacksmith Fork River, East Fork of the Little Bear, and Little Bear River.

The total irrigated area in Cache County amounts to approximately 107,000 acres requiring a supplemental supply estimated at 42,000 acre-feet. There is an abundance of irrigation water during the early part of the irrigation season for lands not served by storage. During July, a definite shortage exists and increases through the end of the growing season.

Present storage development serving Cache County lands consists of three reservoirs, namely: (1) Newton Reservoir located on Clarkston Creek with a capacity of 5,200 acre-feet. (2) Hyrum Reservoir located on Little Bear River with a capacity of 14,570 acre-feet. (3) Bear Lake with a total available storage of 472,000 acre-feet, and undetermined amount being available to Cache County. Approximately 30,000 acres benefit from storage in Cache County.

Potential Irrigable Land Development

New land development will be possible through the United States Bureau of Reclamation under two proposed projects:

(1) South Cache Unit.- located in southern Cache Valley, would provide a full supply for an estimated 9,000 acres of new land.

(2) Glendale Mapleton Unit.- This project area extending from Preston, Idaho, south to Smithfield, Utah. Water would be provided for irrigation of approximately 10,000 acres of new land.

A more detailed description will be given under "Proposed Reservoir Projects."

Proposed Reservoir Projects

Bear Lake is the only reservoir storing waters of Bear River proper. It provides complete regulation of waters originating above it for irrigation and power production further downstream. Reservoirs are needed downstream to supply additional requirements in the lower basin and to release for development, waters above Bear Lake, ~~not~~ utilized downstream.

The many complications of correlating irrigation and power utilization within the basin necessitates exhaustive studies of development possibilities. The proposed reservoir in Cub River, and also the suggested enlargement of Cutler Reservoir are important factors in the over-all development in the Bear River Basin.

Two projects are outlined for the development of the water resources of Cache County, which would be sponsored by the United States Bureau of Reclamation.

South Cache Unit.- Two reservoirs, one of 20,000 acre-feet at the Hardware Ranch site on Blacksmith Fork River, 15 miles east of Hyrum, Utah, and another of 7,200 acre-feet capacity at the Porcupine site on the East Fork of the Little Bear River, 10 miles southeast of Hyrum, and two main canals would provide a full water supply for 9,260 acres of new land and 3,000 acres of inadequately irrigated land in southern and western Cache County. Cost estimates are not included.

Glendale - Mapleton Unit.- Construction of this unit would include the enlargement of the existing Glendale Reservoir on Worm Creek, a tributary of Cub River, from its present capacity of 5,780 acre-feet to 25,000 acre-feet; a feeder canal from Mink Creek to Glendale Reservoir, and additional reservoir of 23,000 acre-feet capacity at the Mapleton site on Cub River, seven miles southeast of Preston; a feeder canal from Maple Creek to Mapleton Reservoir; and a high line canal from the Glendale Reservoir south to the Mapleton Reservoir; and a high line canal from Mapleton Reservoir south to Smithfield, Utah.

With these facilities, water would be provided for irrigation of 9,940 acres of new land, and 50,000 acres of land now inadequately irrigated between Preston and Smithfield. Cost estimates are not complete. (Reservoir construction would be located in Idaho. Total lands benefited includes Idaho and Utah lands.)

Summary.- Proposed ultimate development as outlined heretofore in the South Cache Unit and the Glendale - Mapleton Unit will provide the necessary supplemental supply to the inadequately irrigated lands, and a full supply to the proposed irrigable lands in Cache County. These investigations are being completed by the Bureau of Reclamation.

Table 7 summarizes the proposed reservoir projects, showing the name of the reservoir, source of supply, proposed capacity, and the area to be benefited. No cost estimates are given for these projects.

TABLE 7

PROPOSED RESERVOIR PROJECTS IN CACHE COUNTY (1)

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Area to be Benefited Acres*
<u>South Cache Unit</u>			
Hardware	Blacksmith Fork River	20,000	3,000 s
Porcupine	East Fork Little Bear River	7,200	9,260 n
<u>Glendale - Mapleton Unit</u>			
Glendale	Worm Creek Mink Creek	25,000	9,940 n
Mapleton	Cub River	23,000	50,100 s
	TOTAL	75,200	53,100 s 19,200 n

(1) Proposed by the Bureau of Reclamation.

* s - Supplemental supply to inadequately irrigated lands.
n - A full supply to new lands.

Diversion and Conveyance Needs

There are 64 irrigation companies in Cache County serving approximately 107,000 acres of irrigated land. The distribution systems serving this area consist of approximately 282 miles of main canals with an average intake capacity of 38 c.f.s., and 158 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 14 c.f.s.

Of the total number of irrigation companies in Cache County, 19 have indicated help was required to construct needed distribution projects. The major need relative to improvement and repair of the existing distribution systems is canal lining to prevent excessive seepage losses of irrigation water, and also reducing the danger of water logging or seeping the land below leaky canal sections. Proper realignment and enlargement is also needed in a number of canals to increase their efficiency.

Extensive investigations and measurements of water losses due to seepage have been made in certain canals of this country. Results of certain investigations are outlined in more detail.

Logan Northern Canal.- Extensive investigations were made by the Soil Conservation Service in cooperation with the Utah Agricultural College Extension Service in investigating the operation and efficiency of the Logan Northern Canal.

The major problem confronting the irrigation company was to stabilize the existing canal section included from the point of diversion from Logan River and extending to its junction with 4th North and the Boulevard, approximately 9,600 feet downstream.

Excessive seepage from the steep side hill above the canal has previously caused complete failure of certain canal sections, the result not only causing complete loss of water for the 3,600 acres served by this canal, but also danger to life and property located just south and below the danger sections.

To correct this major problem, the company instigated a program of lining with concrete and installing extensive drains in the most dangerous sections each year. This project received first consideration in engineering and installation of canal lining and drains by the Utah Water and Power Board. Approximately 500 linear feet were lined during the spring of 1948, at a cost of approximately \$5,000.

Logan Hyde Park Smithfield Canal.- Measurements were taken in a section of this canal located from the rating flume and downstream 1,000 feet to a point where the canal enters the Logan Golf Course. Results of these measurements indicated approximately 30 per cent conveyance loss per mile on the basis of a 1,000 foot section measured. 56 c.f.s. was passing the rating flume when these measurements were taken.

Richmond Canal.- As a result of measurements to determine seepage losses in certain sections of this canal, the irrigation company, assisted by the Soil Conservation Service, lined approximately 1800 feet of canal during the spring and fall of 1948.

Seepage losses in this section before the lining was installed amounted to approximately 20 per cent per mile.

West Cache Canal.- This canal has two major problems:

(1) Certain sections of the canal are endangered by seeps and slides where located along steep slide hills.

(2) Excessive seepage losses occurred principally along sections of the canal which were made in fill.

Dr. Israelsen, of the Utah State Agricultural Experiment Station has made investigations concerning these problems.

Paradise Irrigation Canal Company.- Proper realignment and enlargement of the existing canal were the major needs of this irrigation company. The Utah Water and Power Board provided technical engineering and recommendations to make these improvements during the fall of 1947.

Summary

Table 8 summarizes the proposed projects, showing the name of the irrigation company, its source of supply, type of project, estimated construction cost, and areas to be benefited.

TABLE 8
 PROPOSED DIVERSION AND CONVEYANCE NEEDS
 AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS.

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost	Status of Invest.	Area to be Benefited Acres
Benson	Logan River	0.4 mile - Canal Lining	6,000	Prel. Est.	1,000
Benson Bear Lake	Logan River	0.26 Mile - Pipe Installation	5,000	"	750
Covevill	High Creek	0.6 mile - Canal Realignment 1.5 miles - Cleaning and Enlargement	2,000	"	700
Hyrum Ditch	Little Bear River Hyrum Reservoir	3.0 miles - Canal Lining 2.0 miles - Repairs and Alterations 14 Control Structures	49,900	"	2,400
Logan Hyde Park Smithfield Canal	Logan River	0.20 mile - Canal Lining	4,500	"	3,060
Logan Northern *	Logan River	0.75 mile - Canal Lining	40,000	Complete	3,700
Nibley-Blacksmith Fork	Blacksmith Fork River	2.0 miles - Canal Lining 1.0 mile - Canal Realignment	31,500	Prel. Est.	2,800
Paradise Irrigation**	Little Bear River	1.0 mile - Canal Realignment	10,000	"	2,340

TABLE 8. PROPOSED DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Providence and Smith Fork	Blacksmith Fork River	0.38 mile-Canal Lining 3.0 miles Cleaning and Enlargement 2-Diversion Dam Replacements 20 Control Structures	9,700	Prel. Est.	1,000
Richmond ***	High Creek Cherry Creek City Creek	-----	----		6,000
Riverside Pump	Bear River	0.5 miles - Re-alignment 0.5 miles - Pipe Installation	10,000	"	125
Smithfield East Bench	Logan Northern Canal	0.25 miles - Canal Lining	2,500	"	660
Smithfield North Bench	Summit Creek Logan Northern	1.0 mile-Canal Lining 0.5 Enlargement	8,500	"	1,550
South West Lewiston	Cub River	2.5 miles Clean- ing and Enlargement 25 - Control Structures	1,600	"	2,800
Spring Creek Water	Spring Creek	8.0 miles-Canal Lining 0.5 mile-Realign- ment	61,000	"	900
Spring Creek	Spring Creek	1.0 mile-Canal Lining 12 - Control Structures 0.75 mile-clean- ing and Enlargements	10,000	"	2,000
Webster	High Creek	0.20 mile-Canal Lining 2.3 miles-Canal Repairs and Alterations 1 - Diversion Dam Replacement	3,850	"	700

TABLE 8. PROPOSED DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Wellsville City	Springs Hyrum Reservoir	1.0 miles-canal repair and alterations 4 - control structures	1,900	Prel. Est.	500
West Cache Canal	Bear River Bear Lake	1.75 miles-canal lining 5.0 miles-drainage and stabilization of steep side slopes	56,000	"	17,200
TOTAL			<u>\$313,950</u>		<u>50,185 acres</u>

* Approximately 500 linear feet were lined under the supervision of the Utah Water and Power Board in the spring of 1948, at a cost of \$4,950.

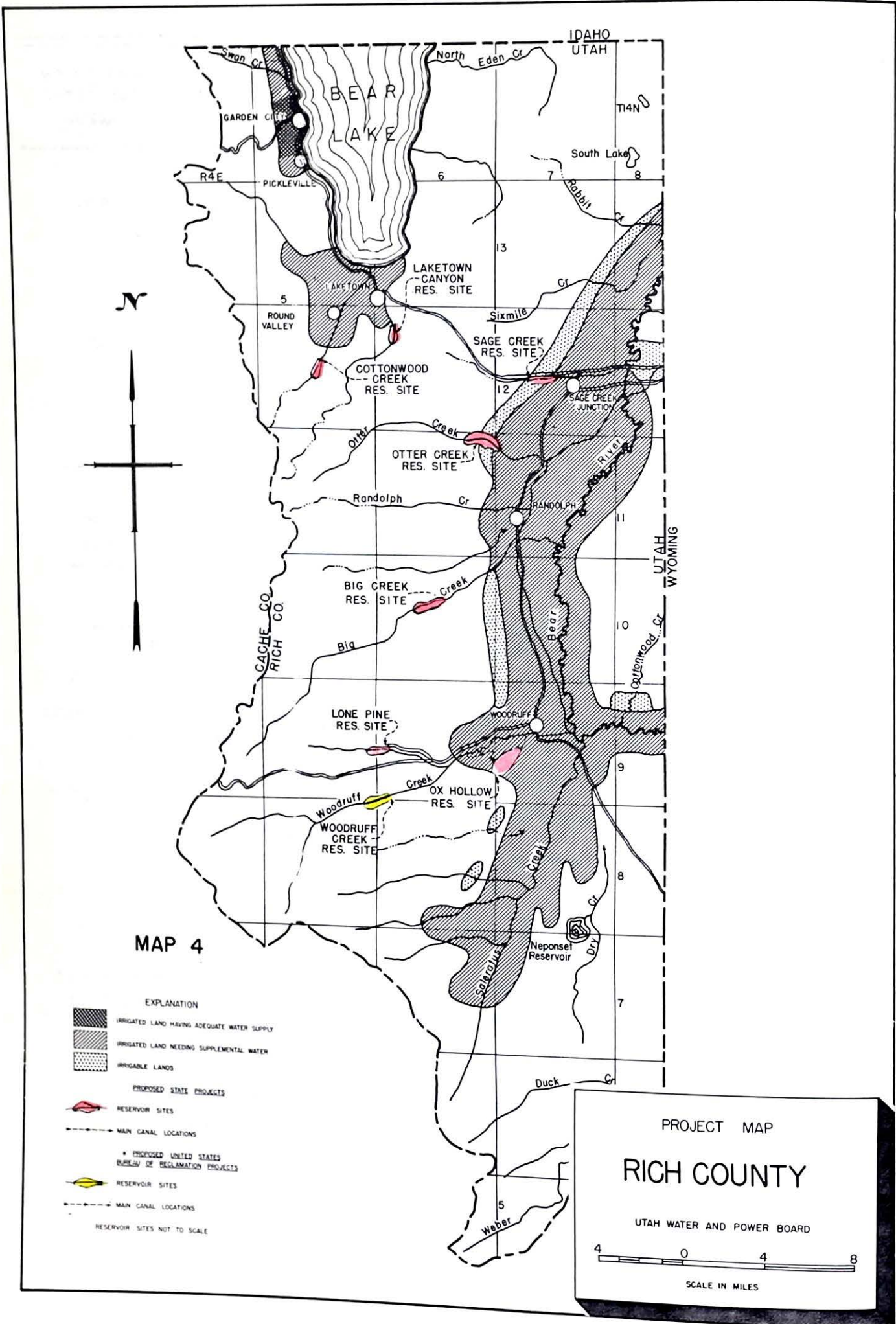
** Utah Water and Power Board provided the engineering of improvements made in 1947, and construction costs were assumed by the Irrigation Company.

*** Canal lining by gunite and concrete lining was installed during the spring of 1948, under the supervision of the Soil Conservation Service Research Division.

Summary

Cache County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects.)

(1) Reservoir Projects - - - - -	\$ None
(2) Diversion and Conveyance Projects - - -	\$ 313,950
TOTAL - - -	<u>\$313,950</u>



R I C H C O U N T Y

Introduction

Rich County lies entirely within the Bear River Drainage Area. The principal stream is Bear River with its major tributaries draining directly into Bear River, being Woodruff Creek, Big and Little Creeks, and Otter Creek. The principal streams draining directly into Bear Lake are the Big Springs, and Laketown Canyon and Swan Creeks.

The discussion of supplemental water requirements in Rich County is divided into three areas: (1) Woodruff and Randolph Drainage Area, (2) Laketown and Round Valley Drainage Area and (3) Garden City -Swan Creek Drainage Area.

Woodruff-Randolph Drainage Area

This area includes the eastern and southern half of Rich County, with the head waters draining the eastern slopes of the Wasatch Mountains. The principal streams from north to south are Saleratus, Woodruff, Big, Little and Otter Creeks, all draining into Bear River.

These streams serve an estimated 15,000 acres, requiring an estimated supplemental supply of 11,000 acre-feet.

Storage development in the Woodruff-Randolph drainage area is urgently needed to insure necessary crop production for a stable agricultural economy in this area. At the present time, they are unable to efficiently use their available water supply due to the peak run off occurring during April, May, and June. After this time, their available water supply is negligible when it is most urgently needed.

Laketown-Round Valley Drainage Area

This area lies in the Northern portion of the County, lying at the southern tip of Bear Lake.

The principal streams are Laketown Canyon Creek and Big Springs. Underground pump wells in the vicinity of Laketown also supplement surface stream flows.

The irrigated land in this area amounts to about 3000 acres, which requires an estimated supplemental supply of 1000 acre-feet.

Garden City - Swan Creek Drainage Area

This area lies in the northwestern portion of Rich County, lying along the western shores of Bear Lake.

Swan Creek is the principal source of supply and serves approximately 2300 acres, of which 1000 acres has a full supply, leaving an estimated 1300 acres requiring a supplemental supply of 1100 acre-feet.

Present Storage Development

The Neponset Reservoir with a capacity of 6000 acre-feet located in south Rich County and the Lone Pine Reservoir located on the right fork of Woodruff Creek with a capacity of 272 acre-feet, are the two principal reservoirs serving an estimated 6000 acres of irrigated land.

Proposed Reservoir Projects

Seven reservoir projects are outlined to assist in developing the water resources in Rich County. Five projects are located in the Woodruff - Randolph Drainage Area, and two projects are located in the Laketown - Round Valley Drainage Area. The proposed reservoir development would supply 11,600 acre-feet for supplemental water requirements in the Woodruff-Randolph Area, and 650 acre-feet for supplemental water requirements in the Laketown-Round Valley Area. One project is outlined as reported by the U. S. Bureau of Reclamation for a reservoir project on Woodruff Creek.

Woodruff-Randolph Drainage Area

Ox Hollow Reservoir Project.- The Woodruff Irrigation Company proposes a reservoir of 4870 acre-feet capacity at a site approximately three miles southwest of Woodruff, located in Ox Hollow, an offstream site from Woodruff Creek. A five and a half mile feeder canal will be required to divert water from Woodruff Creek into this reservoir area. This project will provide a supplemental supply to an estimated 6000 acres of inadequately irrigated land in the vicinity of Woodruff, and would benefit about 200 people. Necessary engineering and estimates have been completed by the Utah Water and Power Board, with an estimated construction cost of \$249,000. Seventy-five thousand dollars was allocated towards completion of this project, with additional funds to be made available during the ensuing biennium.

Lone Pine Reservoir Project.- (This project was considered as an alternate to the Ox Hollow Reservoir site). - The Woodruff Irrigation Company proposes to increase the capacity of the existing reservoir from 272 to 611 acre-feet. The existing reservoir is located on the right hand fork of Woodruff Creek. This project will provide a supplemental supply to an estimated 700 acres of inadequately irrigated land in the vicinity of Woodruff, and would benefit about 200 people. Necessary engineering and estimates have been completed by the Utah Water and Power Board with an estimated construction cost of \$50,000.

Big Creek Reservoir Project.- The Randolph Irrigation Company proposes a reservoir of 1000 acre-feet capacity at a site on Big Creek west of Randolph. This project would provide a supplemental supply to an estimated 4000 acres in the vicinity of Randolph, and would benefit approximately 100 families. Preliminary surveys and estimates have been made by the State Engineer's office with an estimated construction cost of \$135,000.

ACCOMPLISHMENTS OF THE UTAH WATER AND POWER BOARD

GENERAL COMMENTS

In creating the Utah Water and Power Board, the 1947 Legislature provided it with a \$1,000,000 Construction Fund and a \$200,000 Administrative Fund to make, first, a complete inventory of needed water projects throughout the State and, second, to investigate the feasibility of such projects and design them for construction. A further appropriation of \$155,000.00 for administrative purposes was made by the 1949 Legislature. Of the total \$355,000.00, as appropriated for administrative purposes, approximately \$288,000.00 will have been expended as of June 30, 1951, leaving an unexpended balance of approximately \$67,000.00 that has or will be returned to the General Fund. The total estimated expenditure of \$288,000.00 accomplished a detailed inventory showing the need of building 177 reservoirs throughout the state, lining and constructing canals and laying pipe lines. The total estimate of work covered by the inventory was \$13,568,000.00. Investigation and engineering work was done on all projects approved for investigation; also considerable funds were used for organizational expense, matters pertaining to the Colorado River and other interstate streams, stream gaging and other important needs relating to water within the State of Utah.

The State funds allocated to irrigation or water companies by the Utah Water and Power Board are not gifts or grants, but are advanced to the sponsors of feasible projects under legal contracts which provide that the entire project as constructed, all water rights, easements and appurtenant facilities, must vest in the State of Utah. The irrigation or water company must agree to purchase the completed project at cost, without interest, and to make regular annual payments over a set period of time until all money advanced by the State has been fully repaid.

As a result of the above appropriations, the accomplishments of the Utah Water and Power Board to date, as detailed in accompanying schedule, are as follows:

Twenty-seven projects have been completed, conserving 31,310 acre-feet of water, to be applied on 76,433 acres of land and benefiting 17,180 people.

Five projects, now under construction, will conserve 17,223 acre-feet of water, to be applied on 25,540 acres of land and will benefit 4,125 people.

Five projects, with contracts being prepared, will conserve 2,464 acre-feet of water, to be applied on 12,486 acres of land and will benefit 4,425 people.

The value of the 50,997 acre-feet of water conserved in the State will amount to \$2,549,850.00 on the basis of \$50 per acre-foot. As a result of this program, it is estimated that the increase in the tax valuation of the land benefited in the State is approximately \$2,000,000.00 based on a 20% increase in value.

Pursuant to contracts now in force, regular annual payments in the amount of \$49,143.87 have been returned to the State of Utah, all of which have been reallocated to other projects approved for construction. Payments have been made promptly, and there are no delinquencies as of this date.

Investigation, survey and plans are complete for fourteen additional projects estimated to cost \$1,025,530.80, which have been tentatively approved by the Utah Water and Power Board for construction, pending availability of funds.

Investigation, survey and plans are progressing on twelve additional projects estimated to cost \$1,260,101.00.

DETAIL OF ACCOMPLISHMENTS OF THE UTAH WATER AND POWER BOARD

PROJECTS APPROVED FOR CONSTRUCTION DURING THE PERIOD OF MAY 12, 1947 TO JUNE 1, 1951

Name of Sponsor	County	Type of Project	Benefits			Approved by UW&PB and re- turnable to State--100%	To be Paid For by Sponsor	Est. Total Cost	Est. Water Saved or Reservoir Ca- pacity Furnished (Ac. Ft. Yearly)
			Acres of Land (Old)	(New)	Population				
PROJECTS FOR WHICH CONSTRUCTION IS COMPLETE:									
1. Kents Lake Reservoir Company	Beaver	Reservoir	3,460	---	1,500	\$122,147.00	\$ 25,000.00	\$147,147.00	2,023
2. East Grouse Creek Water Company	Box Elder	Drilled Well	1,800	---	100	2,500.00	2,682.78	5,182.78	225
3. Marble Creek Irrigation Company	Box Elder	Pipe Line	600	100	120	18,793.95	---	18,793.95	450
4. Blue Creek Irrigation Company	Box Elder	Reservoir	2,657	500	100	54,000.00	36,800.00	90,800.00	2,657
5. Wellsville City Irrigation Company	Cache	Siphon & Dam	200	50	900	3,500.00	3,999.00	7,499.00	90
6. Benson-Bear Lake Irrigation Company	Cache	Pipe Line	900	100	80	4,400.00	310.00	4,710.00	600
7. Logan Northern Canal Company	Cache	Canal Lining	3,600	---	2,500	11,583.58	---	11,583.58	552
8. Wellington Canal Company	Carbon	Canal Flumes	2,636	---	900	3,000.00	2,637.99	5,637.99	100
9. Kays Creek Irrigation Company	Davis	Pipe Line	3,000	200	600	8,217.93	1,339.99	9,557.92	360
10. Laytona Town Corporation	Davis	Pipe Line	2,600	100	350	17,341.34	3,796.08	21,137.42	540
11. Boulder Irrig. & Water Development Co.	Garfield	Reservoir	2,900	1,000	135	31,684.70	---	31,684.70	1,348
12. Spring Creek LaVerkin Irrigation Co.	Iron	Reservoir	400	50	300	14,000.00	5,260.00	19,260.00	315
13. Nephi Irrigation Company	Juab	Silt Reservoir	3,000	---	2,000	4,604.14	---	4,604.14	Silt Control
14. Callao Irrigation Company	Juab	Concrete Canals	1,200	500	70	26,706.90	3,659.00	30,365.90	1,440
15. Meadow Irrigation and Canal Company	Millard	Drilled Well	2,500	200	560	11,500.00	274.27	11,774.27	400
16. Bullion Creek Irrigation Company	Piute	Pipe and Canal	650	50	50	17,500.00	1,103.94	18,603.94	600
17. Granite Water Company	Salt Lake	Pipe Line	50	30 Lots	115	7,500.00	40.17	7,540.17	90
18. Bell Canyon Irrigation Company	Salt Lake	Reservoir	3,400	---	300	29,873.47	---	29,873.47	488
19. Gunnison Fayette Irrigation Company	Sanpete	Sevier River Diversion Dam	10,500	---	750	5,500.00	---	5,500.00	100
20. West View Irrigation Company	Sevier	Sevier River Diversion Dam	2,500	---	250	5,500.00	---	5,500.00	100
21. Settlement Canyon Irrigation Company	Tooele	Pipe Line	2,000	200	1,875	11,405.88	---	11,405.88	540
22. Ouray Park Irrigation Company	Uintah	New Canal	12,000	3,000	250	32,000.00	7,327.00	39,327.00	12,600
23. Summit Creek Irrigation & Canal Co.	Utah	Reservoir	3,000	500	1,500	70,000.00	20,000.00	90,000.00	1,247
24. Hanksville Irrigation Company	Wayne	Diversion Dam River Revetment	660	---	100	11,000.00	4,702.15	15,702.15	3,000
25. Charleston Water Conservancy District	Wasatch	Complete water system	1,200	60 Lots	325	55,000.00	13,650.15	68,650.15	100
26. Veyo, Central, Gunlock Irrigation Cos.	Washington	Reservoir	1,200	400	200	85,607.61	14,392.39	100,000.00	1,145
27. Weber-Box Elder Pipe Line Association	Weber	Pipe Line Irrigation System	750	250 Lots	1,250	77,000.00	17,045.83	94,045.83	200
Totals for projects for which construction is complete			69,363	7,070	17,180	\$741,866.50	\$164,020.74	\$905,887.24	31,310
PROJECTS NOW UNDER CONSTRUCTION:									
28. Sheep Creek Irrigation Company	Daggett	Enlarge Canal	5,000	500	300	\$ 20,000.00	\$ 8,000.00	\$ 28,000.00	7,200
29. Blanding Irrigation Company	San Juan	1 Mile Tunnel	5,240	---	1,300	75,000.00	14,000.00	89,000.00	1,600
30. South Despain Ditch Company	Salt Lake	Reservoir repair near Alta	900	---	250	2,500.00	2,500.00	5,000.00	167
31. Woodruff Irrigating Company	Rich	Reservoir	6,000	---	325	84,000.00	46,000.00	130,000.00	2,256
32. Dry Gulch Irrigation Company	Duchesne	12 Mile Canal	5,900	2,000	1,950	29,000.00	12,000.00	41,000.00	6,000
Totals for projects now under construction			23,040	2,500	4,125	\$210,500.00	\$ 82,500.00	\$293,000.00	17,223
PROJECTS FOR WHICH CONTRACTS ARE BEING PREPARED:									
33. Independent Canal & Reservoir Company	Emery	Reservoir	2,516	500	175	\$ 46,181.85	\$ 28,891.38	\$ 75,073.23	725
34. Meadow Irrigation and Canal Company	Millard	Drilled Well	---	---	---	2,330.67	9,307.33	11,638.00	200
35. Central Water Works Company	Sevier	Spring Development & Pipe Line	600	---	---	26,000.00	10,059.87	36,059.87	239
36. Grantsville South Willow Irrigation Co.	Tooele	Pipe Line	3,000	---	1,750	20,000.00	5,165.58	25,165.58	600
37. Pleasant Grove Irrigation Company	Utah	Pipe Line	5,870	---	2,500	2,264.85	2,264.86	4,529.71	700
Totals for projects for which contracts are being prepared			11,986	500	4,425	\$ 96,777.37	\$ 55,689.02	\$152,466.39	2,464
TOTALS FOR ALL PROJECTS APPROVED FOR CONSTRUCTION			104,389	10,070	25,730	\$1,049,143.87	\$302,209.76	\$1,351,353.63	50,997
Average Cost Per Acre-Foot of Water Saved						\$ 20.57	\$ 5.93	\$ 26.50	

Otter Creek Reservoir Project.- The Otter Creek Irrigation Company proposes a reservoir located at a site on Otter Creek. Additional storage is needed to provide a supplemental supply to 2200 acres of inadequately irrigated land, and a full supply to 500 acres of new land located about five miles north of Randolph, and would benefit approximately ten families.

The local water users are interested in constructing a dam approximately 2000 acre-feet capacity. No estimates have been made at this capacity. However, the State Engineer has completed the necessary field surveys and estimates for a reservoir of 5400 acre-feet capacity, with an estimated construction cost of \$307,000.

Another estimate was given for a reservoir of 2300 acre-feet capacity with an estimated construction cost of \$135,000.(1)

- - - -(1) Utah Emergency Relief Administration, Report on Proposed Reservoirs in Utah, p. 75.

Sage Creek Reservoir Project.- Sage Creek Water Users propose a reservoir of 350 acre-feet capacity at a site on Sage Creek, located approximately six miles north of Randolph. This project will provide a supplemental supply to an estimated 700 acres of inadequately irrigated land in the vicinity of Sage Creek, and would benefit approximately three families. Investigations are in a reconnaissance stage only, with an estimated construction cost of \$28,000.

Laketown - Round Valley Drainage Area

Laketown Canyon Creek Reservoir Project.- Laketown Canyon Irrigation Company proposes a reservoir with a capacity of 800 acre-feet at a site on Laketown Canyon Creek south of Laketown. This project would provide a supplemental supply to an estimated 600 acres in the vicinity of Laketown, and would benefit approximately 50 families. Preliminary surveys and estimates have been made, with an estimated construction cost of \$50,000.(2)

- - - -(2) J. R. Barker, Engineer Specialist for Utah Extension Service.

Cottonwood Creek Reservoir Project.- The Cottonwood Water and Reservoir Company proposes a reservoir of 350 acre-feet capacity, located at a site on Cottonwood Creek in Round Valley. This project would provide a supplemental supply to an estimated 600 acres of inadequately irrigated land in Round Valley, and would benefit approximately ten families. Investigations are in a reconnaissance stage only, with an estimated construction cost of \$28,000.

BUREAU OF RECLAMATION PROJECT

Woodruff Creek Reservoir Project.- More commonly called the Deer-lick Site, was reported by the Bureau of Reclamation in 1940, with a capacity of 9000 acre-feet located on Woodruff Creek, with an estimated construction cost of \$781,000. The Utah Water and Power Board made an estimate at the same site for a 5000 acre-feet capacity, with a cost estimated at \$429,000 .

Conclusion: This project does not appear feasible until additional storage development and regulation of Bear River waters are made.

Summary

Table 9 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 9
PROPOSED RESERVOIR PROJECTS IN RICH COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost\$ Total	Acre-Foot	Area to be Benefited Acres*
<u>Woodruff-Randolph Drainage Area</u>					
Ox Hollow	Woodruff Creek	4,870	\$249,000	51	6,000 s
Lone Pine Enl.	Woodruff Creek	611**	50,000	147	700 s
Big Creek	Big Creek	1,000	135,000	135	4,000 s
Otter Creek	North Fork	5,400	307,000	57	500 n
Sage Creek	Sage Creek	350	28,000	80	2,200 s 700 s
<u>Laketown-Round Valley Drainage Area</u>					
Laketown	Laketown Canyon	300	30,000	100	600 s
Cottonwood Creek	Cottonwood Creek	350	28,000	80	600 s
TOTAL		<u>12,881</u>	<u>\$827,000</u>	<u>86</u>	<u>14,800 s</u> <u>500 n</u>
<u>Proposed by U. S. Bureau of Reclamation</u>					
Woodruff	Woodruff Creek	9,000	781,000	87	

*Area benefited: s-Supplemental supply to inadequately irrigated lands
n-Full supply to new irrigable lands.

** Reservoir Enlargement from 272 to 611 acre-feet.

Diversion and Conveyance Needs

There are 11 irrigation companies in Rich County serving approximately 20,300 acres of irrigated land. The distribution systems serving this area consist of 65 miles of main canals with an average intake capacity of 59 c.f.s., and 4 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 8 c.f.s.

Results of the survey show that six irrigation companies have proposed needed diversion and conveyance projects.

The existing distribution systems are generally in good condition with regards to alignment and required capacities. The major needs relative to improvement and repair of these systems are:

(1) Canal lining, to prevent excessive seepage losses of available irrigation water, and to reduce the danger of water logging or seeping the land below leaky canal sections.

(2) A number of control structures, such as take-out gates and measuring devices are needed. Due to climatic conditions in the Randolph-Woodruff Drainage Area, which causes excessive frost action, permanent concrete structures have not given satisfactory service. As a result, control structures have been made, for the most part, of wood which requires replacement within a short term of years, but is more feasible from the economic standpoint than more permanent type installations.

(3) Diversion structures, along the Bear River are of the temporary type which require annual repair and maintenance. It is the opinion of the local water users that this type of structure meets local requirements satisfactorily.

Summary

Table 10 summarizes the proposed projects, showing the name of irrigation company, its source of supply, project description, estimated construction cost, status of investigation and areas to be benefited.

TABLE 10

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres.
Hodges	Swan Creek	6.0 miles-canal enlargement)	2,000	Prel. Est.	1,043
Laketown	Big Springs Pump Wells	3.0 miles-canal lining)	15,000	"	1,000
Lower Meadowville and Meadowville	Big Springs	2.5 miles-canal enlargement) 4.0 miles-canal lining)	17,500	"	870
Swan Creek	Swan Creek	1.5 miles canal lining) 1-diversion dam) repair) 1-control structure)	20,000	"	750
Woodruff	Woodruff Creek Long Pine Reservoir	2.0 miles-canal lining) 1-control structure)	10,500	"	6,000
TOTAL			<u>\$65,000</u>		<u>8,663</u>









Rich County Summary

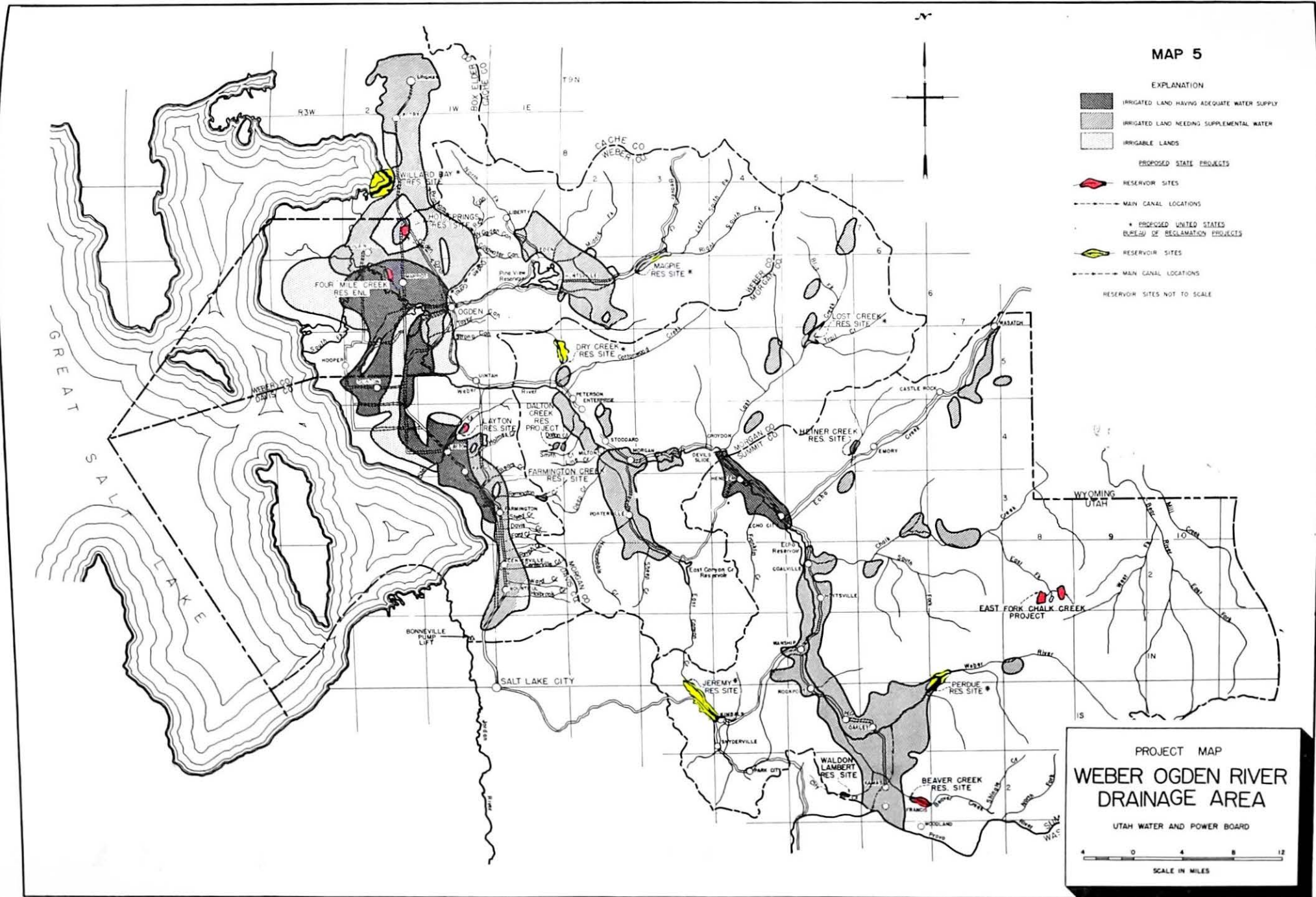
Rich County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$827,000
(2) Diversion and Conveyance Projects - - -	65,000
TOTAL	<u>\$892,000</u>

MAP 5

EXPLANATION

-  IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
-  IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
-  IRRIGABLE LANDS
- PROPOSED STATE PROJECTS**
-  RESERVOIR SITES
-  MAIN CANAL LOCATIONS
-  * PROPOSED UNITED STATES BUREAU OF RECLAMATION PROJECTS
-  RESERVOIR SITES
-  MAIN CANAL LOCATIONS
- RESERVOIR SITES NOT TO SCALE



PROJECT MAP
**WEBER OGDEN RIVER
 DRAINAGE AREA**
 UTAH WATER AND POWER BOARD

0 4 8 12
 SCALE IN MILES

SUMMIT COUNTY

Introduction

Summit County lies within the Weber-Ogden, Provo, Bear and Green River Drainage Areas. The principal irrigated areas lie within the Weber-Ogden and Provo River drainage areas. Therefore, only these will be discussed in this report.

Weber-Ogden River Drainage

This drainage is referred to as the Weber River Project area. The river heads in the high Uinta Mountains and flows westward to join Great Salt Lake. Extensive irrigation and power developments have been already accomplished with the construction of the Echo and Pineview reservoirs by the Bureau of Reclamation. However, these projects largely benefit Morgan, Weber, Davis and Box Elder Counties, which lie downstream.

The irrigated area in Summit County amounts to approximately 29,000 acres with supplemental requirements estimated at 11,000 acre-feet. Serving Summit County lands are 11 reservoirs, some very small, with a total storage capacity of 78,368 acre-feet. Of this total 74,000 acre-feet is provided by the Echo Reservoir, the major part of this storage serving lands downstream. The total reservoir storage available to Summit County lands is 8300 acre-feet.

Provo River Drainage Area

This area lies within the southwestern part of Summit County draining into Provo River. Irrigated land in this area amounts to 2900 acres with an estimated supplemental requirement of 1200 acre-feet. Present storage development in this area is negligible.

Proposed Reservoir Projects

Five reservoir projects are outlined for development of the water resources within this county. It is noted that two sites are mentioned on Beaver Creek in the vicinity of Kamas, which would serve the same area. Only one of these reservoir sites is proposed for final construction with further investigations required to determine the most feasible site.

As this County lies within the Weber River Project, a brief outline is given of the proposed developments which is being currently investigated by the Bureau of Reclamation, that will affect Summit County lands.

Echo Ditch Storage Project.- The Echo Ditch Irrigation Company proposes a reservoir of 400 acre-feet capacity at a site on Heiner Creek. This project would provide supplemental water to 600 acres of inadequately irrigated land bordering Echo Creek extending from Emery to Echo City. Approximately 75 people would benefit from supplemental water that would be provided by this project. Preliminary surveys and cost estimates have been made by the State

Engineer's Office on an alternate site located approximately one mile downstream from the proposed reservoir site, with an estimated construction cost of \$180.00 an acre-foot. The sponsors of this project request investigations of a smaller site which appears to be more feasible and would satisfy their supplemental water requirements.

This area will in all probability not benefit from the proposed Weber River Development Plan.

Note: This project has received approval for investigation by the Utah Water and Power Board.

Yellow Pine Reservoir Project.- (Alternate to Beaver Creek Reservoir site). Beaver and Shingle Creek Irrigation Companies propose a reservoir of 1800 acre-feet capacity at a site on Beaver Creek about five miles southeast of Kamas. This project would provide a supplemental supply to approximately 4000 acres of inadequately irrigated land adjacent to Kamas. There are about 200 families that would benefit from this project.

Preliminary surveys and estimates have been made with an estimated construction cost of \$289,000.

Beaver Creek Reservoir Project.- Beaver and Shingle Creek Irrigation Companies propose a reservoir of 2512 acre-feet capacity at a site on Beaver Creek, below the Fish Hatchery. This project would provide a supplemental supply to approximately 4000 acres of inadequately irrigated land in the vicinity of Kamas. There are about 200 families that would benefit from this project. Preliminary surveys and cost estimates have been made by the State Engineer's Office with an estimated construction cost of \$292,800.

The Waldon-Lambert Reservoir Project.- Water Users on City Creek propose a reservoir of 70 acre-feet capacity at a site on City Creek west of Kamas. This project would provide a supplemental supply to about 140 acres of inadequately irrigated lands lying west of Kamas. There are about two families that would be directly benefited from this project. Preliminary surveys and estimates have been made with an estimated construction cost of \$7,000.

East Fork - Chalk Creek Project.- Chalk Creek - Hoytsville Water Users propose to increase the capacity of Boyer and Joyce Lakes from 1600 to 1954 acre-feet. The project plan calls for raising the spillway of Boyer Lake approximately three feet, and to raise Joyce Lake Dam and spillway an estimated ten feet, and repair the existing outlet works. An estimated 700 acres of inadequately irrigated land would receive supplemental water and about 1500 people would benefit from this project. Investigations are in a reconnaissance stage. The estimated construction cost is \$18,000.

U. S. Bureau of Reclamation Project

Weber River Project.- Ultimate development of the Weber River is presently being investigated by the U. S. Bureau of Reclamation. The

Perdue and Jeremy Reservoir Sites are under consideration in the Summit County area. The ultimate development of this project would provide supplemental water to an estimated 22,700 acres of irrigated land in Summit County. The Park City - Snyder Area amounting to approximately 5400 acres of irrigated land and the Echo Creek area having 1300 acres of irrigated lands, apparently will not benefit from this development.

New lands available for development are very small, and any irrigable land included will be served under the existing distribution canals.

Summary

Table 11 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, areas to be furnished full and supplemental supplies of irrigation water.

TABLE 11

PROPOSED RESERVOIR PROJECTS IN SUMMIT COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost		Area to be Benefited Acres*
			Total	Acre-foot	
Echo Ditch (**)	Heiner Creek	400	Investigation Required		1,300 s
Beaver Creek	Beaver Creek	2,512	292,000	117	4,000 s
Walden Lambert	City Creek	70	7,000	100	140 s
East Fork Chalk Creek	Chalk Creek	354 (***)	18,000	50	700 s
TOTAL (****)		<u>2,936</u>	<u>\$317,000</u>		<u>4,840 s</u>
Yellow Pine *****	Beaver Creek	1,800	288,000	160	4,000 s

* s - Supplemental supply to inadequately irrigated lands.

n - Full supply to new arable lands.

** Approved for investigation by the Utah Water and Power Board.

*** Enlarge from 1600 to 1954 acre-feet.

**** One of two reservoir sites, alternate to Beaver Creek Reservoir Site. Not included in total cost.

***** Total does not include Echo Ditch Reservoir Project.

Diversion and Conveyance Needs

There are 35 irrigation companies in Summit County irrigating approximately 32,000 acres. The distribution systems serving this area consist of an estimated 73 miles of main canals with an average intake capacity of 29 c.f.s, and 50 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 18 c.f.s. A survey of the 35 irrigation companies show a general need for repair and improvement of the respective distribution systems. The estimated construction cost of correcting the proposed needs for many of the companies ranges between \$5,000 to \$15,000.

Results of the survey regarding diversion and conveyance needs in Summit County show that 14 irrigation companies have proposed needed distribution projects. The proposed projects indicate a general need of repair and replacement of diversion structures, canal repairs and alterations, and canal lining.

The first project for consideration relating to diversion and conveyance needs is the Hoytsville Irrigation Company Canal Lining Project. Preliminary estimates call for four miles of canal lining, with an estimated construction cost of \$40,000.

Proposed storage developments by the United States Bureau of Reclamation will not materially affect the present distribution systems.

Summary

Table 12 summarizes the proposed diversion and conveyance needs for Summit County's distribution systems, showing the name of irrigation company, source of supply, project description, estimated construction cost, and areas to be benefited.

Table 12

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS AND REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Beaver and Shingle Creek	Beaver Creek Shingle Creek	8-diversion dams	7,200	Prel. Est.	3,305
		9-control structures			
		3 miles-canal enlargement			
Boulderville Ditch	Weber River	0.06 mile-canal lining	3,000	"	478
		10-control structures			

TABLE 12. PROPOSED DIVERSION AND CONVEYANCE NEEDS - (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Henefer Irrigation Company	Weber River Echo Reservoir	0.75 mile-canal lining)	6,000	Prel. Est.	1,200
		4.0 miles-canal enlargement)			
		35-control structures)			
Lower Marion Ditch	Weber River Smith and Morehouse	2.0 miles-canal lining)	10,500	"	512
		0.5 mile-canal realignment)			
		2.0 miles-canal enlargement)			
		102-control structures)			
Hoytsville Pipe Water Company	Spring Canyon	Repair and enlarge culinary system)	8,500	"	60 Families
Hoytsville	Weber River Chalk Creek	4 miles-canal lining)	69,000	"	600
		1 mile-canal realignment)			
		100 ft - flume)			
		1-control structure)			
		1-diversion dam)			
Marchant Ext.	Weber River	0.20 mile-canal lining)	3,700	"	350
		0.24 mile-canal realignment)			
		12-control structures)			
New Field and North Bench	Weber River Echo Reservoir	0.5 mile-canal lining)	10,000	"	1,450
		1.5 mile-canal realignment)			
		6-control structures)			
Pineview	Chalk Creek Cottonwood Creek	0.75 mile-canal repairs)	2,500	"	500
		80 ft.-flume)			
		1-control structure)			

TABLE 12. PROPOSED DIVERSION AND CONVEYANCE NEEDS - (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
South Bench Canal	Weber River Echo Reser- voir Fish Lake	2.5 miles-canal enlargement	4,000	Prel. Est.	500
		7-control structures			
		1-diversion Dam			
South Kamas and Washington Canal	Provo River	3.5 miles-canal lining	23,000	"	1,700
		1-control structure			
Upper Marion	Weber River Echo Smith- Morehouse	0.5 mile-canal lining	6,000	"	500
		0.3 mile-canal realignment			
		1.0 mile-canal enlargement			
		1-control structure			
West Hoytsville	Weber River Echo Reser- voir	2.0 miles-canal lining	25,000	"	351
		60 ft-flume			
		1-diversion dam			
		repair			
		5-control structures			
TOTAL			<u>\$178,400</u>		<u>11,851</u>

Summit County Summary

Summit County's estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$317,000
(2) Diversion and Conveyance Projects - - -	<u>178,400</u>
TOTAL	<u>\$495,400</u>

MORGAN COUNTY

Introduction

Morgan County lies entirely within the Weber River drainage area. The principal stream is the Weber River with Lost, East Canyon, Line, Deep, Cottonwood and Hardscrabble Creeks being the main tributaries.

The total irrigated area in Morgan County amounts to about 9,430 acres with an estimated supplemental water requirement of 2,200 acre-feet for the inadequately irrigated lands.

Serving Morgan County lands are three reservoirs, with a total storage capacity of 102,200 acre-feet. Of this total 102,000 acre-feet are provided by the Echo and East Canyon Reservoirs, which were constructed by the Bureau of Reclamation. The Pond Hole Reservoir located on Cottonwood Creek provides the remaining 200 acre-feet. An estimated 3,000 acre-feet are available to certain acres of irrigated land within this county.

Proposed New Land Development

There are 1,000 acres of irrigable land and 500 acres of reclaimable land that could be served under the Weber River Development Plan. An estimated 4,500 acre-feet would provide a full supply to these lands. Storage development proposed on Lost Creek would provide this supply.

Proposed Reservoir Projects

Major storage developments in this area will be accomplished through the Bureau of Reclamation's proposed reservoirs on Lost Creek and Dry Creek. However, small reservoir developments are needed which would not duplicate the Federal Government's efforts and would serve new land not included within the larger development. One reservoir project is outlined as proposed by the Morgan County Water Users.

Dalton Creek Reservoir Project.- The Dalton Creek Irrigation Company proposes two small reservoirs with a capacity of 82 acre-feet to be served by feeder canals from Smith's Creek. This project would provide a supplemental supply to an estimated 300 acres of inadequately irrigated land in the vicinity of Lower Milton, and would benefit approximately 50 people. Preliminary surveys of the reservoir sites were made by the Soil Conservation Service and final design and estimates by the Utah Water and Power Board with an estimated construction cost of \$44,000.

Note: This project was presented for consideration to the Utah Water and Power Board and was not considered for construction at this time following the recommendation of both the sponsors and the Utah Water and Power Board.

Summary

Table 13 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and

areas to be furnished full and supplemental supplies of irrigation water.

TABLE 13

PROPOSED RESERVOIR PROJECTS IN MORGAN COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost Total \$	Estimated Cost Acre-foot	Area to be Benefited Acres*
Dalton Creek	Dalton and Smith's Creek	82	\$44,000	535	300 s
		---	---	---	---
	TOTAL	82	\$44,000	535	300 s

Bureau of Reclamation Projects

Weber River Project

Lost Creek
Dry Creek

Lost Creek
Weber River

Data to be published by Bureau
of Reclamation

* s - Supplemental supply to inadequately irrigated lands.

Diversion and Conveyance Needs

There are 21 irrigation companies in Morgan County serving approximately 9,430 acres of irrigated land. The distribution systems serving this area consist of approximately 39 miles of main canals with an average intake capacity of 15 c.f.s., and 12 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 7 c.f.s.

Nine irrigation companies have proposed needed diversion and conveyance projects. Of the nine projects, one is for culinary purposes only.

The major needs relative to improvement and repair of the existing distribution systems in Morgan County are:

(1) Canal lining to prevent excessive seepage losses of available irrigation water and to reduce the danger of water logging or seeping the land below leaky canal sections.

(2) Proper realignment, cleaning and enlargement of the main canals.

(3) Replacement and repair of existing diversion and control structures.

The need for changes in the existing distribution systems under the Weber River development calls for minor changes in extensions and enlargements which, for the most part, will be handled by the irrigation companies. However, any

major repairs of existing main canals should be carefully analysed to anticipate future requirements.

The Peterson Culinary Project has been approved for investigation by the Utah Water and Power Board. The project includes extending the present pipe line approximately one mile upstream to Bohman Springs to insure a sufficient and sanitary supply of culinary water to benefit about 25 families, with an estimated construction cost of \$10,000.

Summary

Table 14 summarizes the proposed projects, showing the name of irrigation company, its source of supply, project description, estimated construction cost, status of investigation, and areas to be benefited.

TABLE 14
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited* Acres
East Porterville	East Canyon Creek Echo Reservoir	2.5 miles Canal Lining	13,000	Prel. Est.	353
Enterprise Stoddard	Weber River Echo Reservoir	4.0 miles Canal Lining	20,000	"	535
Line Creek	Line Creek Echo Reservoir	1 mile Canal Lining 19 Control Structures	5,500	"	220
Littleton-Milton	East Canyon Deep Creek	3.5 miles Canal Lining	40,000	"	1,000
North West	Cottonwood Creek Pond-Hole Reservoir	0.37 Miles Canal Lining 6.0 miles Canal Enlargement 2 Diversion Dams 6 Control Structures	7,000	"	406
Peterson * Culinary System	Bohman Springs	1 mile Pipe Installation	10,000	"	25 Families

TABLE 14. DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited* Acres
West Richville	East Canyon Creek	2 miles Canal Enlargement 1 Diversion Dam 6 Control Structures	2,000	Prel.	536
Weber Canal	Weber River Echo Reser- voir	1 Diversion Dam 240 ft. Canal Realignment 3 Control Structures	2,000	"	400
West Porter- ville Canal	Mill Creek Echo Reser- voir	0.05 miles Canal Lining 1 Diversion Dam 5.5 miles Canal Realignment	9,000	"	670
TOTAL			<u>\$108,500</u>		<u>3,730</u>

* Approved for investigation.

Summary

Morgan County's estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects.)

(1) Reservoir Projects - - - - - \$ 44,000

(2) Diversion and Conveyance Projects - - - - - \$ 108,500

TOTAL - - - - - \$ 152,500

WEBER COUNTY

Introduction

Weber County lies within the Weber-Ogden River drainage area with the Weber and Ogden Rivers being the major sources of supply. The total irrigated area in Weber County amounts to approximately 55,000 acres, of which 50,000 acres are estimated to have a full irrigation supply.

Serving Weber County lands are four reservoirs with a combined capacity of 146,800 acre-feet. Of this total, 107,600 acre-feet are available to Weber County lands serving approximately 46,900 acres. Ninety-eight percent of the storage was made available through three U. S. Bureau of Reclamation Projects, the East Canyon and Echo Reservoirs on the Weber River drainage, and Pineview Reservoir located on the Ogden River.

Potential Irrigable Land Development

There are approximately 10,600 acres of arable land, and 16,500 acres of reclaimable land by drainage, that can be provided a full water supply through the Weber River development plan which is being investigated by the Bureau of Reclamation.

Proposed Reservoir Projects

Extensive irrigation developments of the Weber and Ogden Rivers have already been accomplished with the construction of the three reservoirs heretofore mentioned. Since 1938, investigations of individual problems have been conducted and present basin-wide studies are directed toward full development of the Weber and Ogden River basins.

To supplement the ultimate plan, small reservoir investigations and construction should be continued in areas which will not be fully supplied or benefited by the larger development.

Three small reservoir projects are outlined for consideration by the water users.

Layton Reservoir Project.- The Davis and Weber Canal Company proposes a reservoir of 1,357 acre-feet capacity at a site on Kays Creek. This project would provide a supplemental supply to 30,000 acres of irrigated land served by the sponsors, and an estimated 20,000 people would be benefited from this development. Preliminary investigations and cost estimates have been made by the State Engineer's Office, with an estimated construction cost of \$290,000. Final consideration of this reservoir site must be correlated with the ultimate plan proposed by the Bureau of Reclamation.

Four-Mile Reservoir Project.- The Warren Irrigation Company proposes a reservoir of an estimated 200 acre-feet capacity located on Four-Mile Creek, about four miles east of Warren and one and a half miles south of

Plain City. The reservoir would be used as an equalizer to more sufficiently control the water supply from Weber River and Echo Reservoir. This project would provide a more efficient supply to the 4,000 acres under this system, and would benefit an estimated 500 people in the vicinity of Warren. The investigation is still in reconnaissance stage, with an estimated construction cost of \$7,000.

Hot Springs Reservoir Project.- The North Ogden Irrigation Company proposes an equalizing reservoir with a capacity of 200 acre-feet located at a site near Hot Springs in the North Ogden area. The main purpose of this project is to provide an equalizing reservoir in the north end of the distribution system, to more efficiently conserve and supply irrigation water for an estimated 750 acres located west of the Hot Springs. This project will benefit the entire North Ogden Irrigation Company share holders. Investigations are still in a reconnaissance stage. The estimated construction costs are not known.

Summary

Table 15 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 15
PROPOSED RESERVOIR PROJECTS IN WEBER COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost		Area to be Benefited Acres*
			Total	Acre-foot	
Layton	Kays Creek	1,357	\$290,000	212	30,000 s
Four Mile	Weber River	200	7,000	9	4,000 s
Hot Springs	Four Mile Creek Ogden River Pineview Reservoir	200	Investigation Required		750 s
TOTAL		<u>1,757</u>	<u>297,000</u>		<u>34,750 s</u>

* s - Supplemental supply to inadequately irrigated lands.
n - Full supply to new arable lands.

Diversion and Conveyance Needs

There are 32 irrigation companies in Weber County, 24 of these serving 300 acres or more, and 3 serving less than 300 acres. Two large irrigation canals, the Weber-Davis canal serving 40,000 acres from Riverdale to Kaysville, constructed by private interests, and the Brigham-Ogden Canal serving 9,937 acres from North Ogden to Brigham, constructed by the U. S. Bureau of Reclamation, are concrete lined. However, with the total length of 216 miles of main canals with an average capacity of 14 c.f.s., many miles of canal sections require lining to increase the efficiency of the water supply, and to prevent excessive raising of the ground water table due to seepage in canals.

Ten diversion and conveyance projects have been proposed by the Water Users of Weber County. Of the ten proposed projects, three are for culinary benefits only.

The first project approved for investigation by the Utah Water and Power Board was the Weber - Box Elder Conservation project under the Brigham - Ogden Canal Company, consisting of installing a pipe system to convey irrigation water from Brigham - Ogden Canal to the Bench lands in North Ogden, with an estimated cost of \$30,000. The Soil Conservation Service has completed the preliminary engineering of the project.

The second project approved for investigation was the proposed North Ogden Culinary Project, consisting of replacing open reservoir with reinforced concrete underground water tank, and replace 3" and 4" sections of existing distribution pipe with 8" pipe, and extend the system to serve new areas. Approximately 1,800 people would benefit from this project. Preliminary investigation and estimates have been made by the sponsor's engineer, with an estimated construction cost of \$70,000.

Eight other projects have been given a priority by the water users. Certain changes in the diversion and conveyance facilities of the distribution systems in Weber County are being included in the Weber River project plan, proposed by the U. S. Bureau of Reclamation. Canals will be enlarged and extended and lined where needed to more efficiently distribute the waters. Therefore, the proposed needs as summarized from present and past surveys will require careful investigations to correlate construction with future developments.

Summary

Table 16 summarizes the proposed projects, showing the name of irrigation company, its source of supply, project description, estimated construction cost, status of investigation, and areas to be benefited.

TABLE 16

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS AND REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Eden Town	Springs	2.5 miles pipe) installation) culinary)	14,000	Prel. Est.	250 people
North Ogden	Ogden River Pineview Reservoir	10 miles-canal) enlargement) 100-control) structures)	8,000	"	4,000
Plain City	Ogden River Weber River	1-diversion dam) 12 miles-canal) improvement) 23-control) structures)	21,000	"	2,324
Rice Creek	Springs Pineview Reservoir.	3.5 miles-canal) lining) 20-control) structures)	14,000	"	700
Strong Canyon Water Company	Water Fall Strong Canyon	3,300 ft-pipe) installation)	4,000	"	Culinary Project
South Weber	Weber River Echo Reservoir	0.75 miles-canal) repairs) 16-control) structures) 1-diversion dam)	2,000	"	500
Weber Box Elder Conservation District	Ogden River Pine View Reservoir	20,000 ft-pipe) line)	30,000(*)	"	400
		20,000 ft-pipe) line)	17,000(**)	"	466
Warren	Weber River Mill Creek Four-Mile Creek	3.0 miles-canal) enlargement)	9,000	"	4,000

TABLE 16. PROPOSED DIVERSION AND CONVEYANCE NEEDS - (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
North Ogden	Cold Water	repair and enlargement of culinary system)	70,000	Prel. Est.	1,800 people
TOTAL			<u>\$189,000</u>		<u>12,530</u>

* This project has received approval for investigation.

** Proposed future needs.

Weber County Summary

Weber County's total estimated cost for the proposed distribution and storage developments, (exclusive of major Bureau of Reclamation Projects).

(1)	Reservoir Projects - - - - -	\$297,000
(2)	Diversion and Conveyance Projects - - -	189,000
	TOTAL	<u>\$486,000</u>

DAVIS COUNTY

Introduction

Davis County lies principally within the Salt Lake Minor Tributaries Drainage Area. However, the major source of irrigation water is from the Weber River carried by distribution systems as far south as Kaysville. Additional water is supplied by a number of small streams originating on the west slopes of the Wasatch Range draining directly into Salt Lake. These major streams from north to south are Kays, Holmes, Bears, Shepherd, Farmington, Davis, Centerville, Steed, Barnard, Ward, Holbrook, and Mill Creeks.

Development of the underground water, by drilling a number of flow and pump wells, has provided supplemental water in the south Davis area. Additional water is received in the Bountiful, North Salt Lake, Woods Cross, and Centerville areas, supplied by the Bonneville Irrigation District, the water being pumped directly from the Jordan River.

The total irrigated area in Davis County amounts to approximately 36,300 acres, of which only 15,000 acres are estimated to have a full supply.

Potential Irrigable Land Development

There are approximately 10,300 acres of arable land, and 5,200 acres of reclaimable land, which can be provided a full water supply through the proposed Weber River Development plan, presently being investigated by the United States Bureau of Reclamation.

Proposed Reservoir Projects

Ultimate development by supplying supplemental water to inadequately irrigated land, and a full supply to the new lands will be provided by the Weber River Project. Therefore, no reservoir projects are outlined to supplement this development.

Future consideration will be given to the Farmington, Layton, and Mill Creek Projects and other like projects of small capacity throughout the county, if they are not included in the Weber River Project. Their ultimate construction will be accomplished to serve, in all probability, as culinary projects.

Summary

Table 17 summarizes the potential reservoir sites located, in Davis County, that could ultimately be included in the Weber River Projects under the direction of the Bureau of Reclamation or through assistance from the Utah Water and Power Board.

TABLE 17

POTENTIAL RESERVOIR PROJECTS IN DAVIS COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Total	Cost \$ Acre-foot	Area to be Benefited Acres*
Farmington Creek**	Farmington Creek	611	\$291,000	477	1,000 s
Layton	Kays Creek	See Weber County Report			

* s - Supplemental supply to inadequately irrigated lands.

** Could serve as a culinary and irrigation project.

Diversion and Conveyance Needs

There are 34 irrigation companies in Davis County serving 36,300 acres of irrigated land. The distribution systems required to serve this land amount to 108 miles of main canals with an average intake capacity of 17 c.f.s., and 97 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 6 c.f.s.

Results of the survey of diversion and conveyance needs in Davis County show that eight irrigation companies and two culinary systems have proposed needed distribution projects.

The first project approved for investigation and construction in this county was the Laytona and Kays Creek Development. The project was divided into two divisions, and is outlined as follows:

Kays Creek Division.- The project is located approximately two and a half miles northeast of Layton. The project plan as outlined calls for 1,585 feet of pipe installation from the mouth of the canyon on the middle fork of Kays Creek to the south fork of Kays Creek. This project would benefit approximately 70 families.

Laytona Pipe Line Division.- This portion of the project plan calls for the installation of 6,356 feet of pipe line which is an extension of the Kays Creek Division. This development will benefit approximately 75 families for culinary purposes.

Investigations on both divisions of this project are complete. Construction was initiated during the summer of 1948, and completion of the project is anticipated before December, 1948. The total estimated construction cost of this project is estimated at \$25,726.

The existing distribution systems, with the exception of the Davis-Weber Canal, will in all probability be affected by the proposed Weber River Project Distribution System. Therefore, any proposed lining, realignment, and enlargement projects should be given a coordinated study before any construction is initiated.

Summary

The following table summarizes the proposed diversion and conveyance projects showing the name of the irrigation company, source of supply, proposed project, estimated construction cost, and areas to be benefited.

TABLE 18
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS.

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Central	Weber River East Canyon & Echo Reservoirs	Canal Lining Repair 3.0 miles-Canal Lining	30,000	Prel. Est.	1,500
Clearfield	Weber River East Canyon & Echo Reservoirs	3.0 miles-Canal Lining 0.75 miles-Canal Repairs 1,000 foot-Flume 14 - Control Structures	90,000	"	5,000
Kays Creek	Middle Fork Kays Creek	1,585 ft.-Pipe Installation	8,226	Complete	1,000
Laytona Town	Middle Fork Kays Creek	6,356 ft.-Pipe Installation	17,500	"	Culinary
Kaysville- Layton		4.0 miles-Canal Lining	30,000	Prel. Est.	
Fife	Weber River East Canyon & Echo Reservoirs	5.25 miles-Canal Lining	60,000	"	800
Stevenson Ditch	Weber River East Canyon & Echo Reservoirs	4.5 miles-Canal Lining	45,000	"	1,500
Straight Ditch	Weber River East Canyon & Echo Reservoirs	5.0 miles-Canal Lining	65,000	"	2,200
West Layton	Weber River East Canyon & Echo Reservoirs	5.0 miles-Canal Lining	50,000	"	2,500

TABLE 18. DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Centerville Town	Parish Creek Barnard Creek	Investigation Required Culinary Project		Præi. Est.	Culinary
		TOTAL	<u>\$395,726</u>		<u>14,500</u>











Davis County Summary

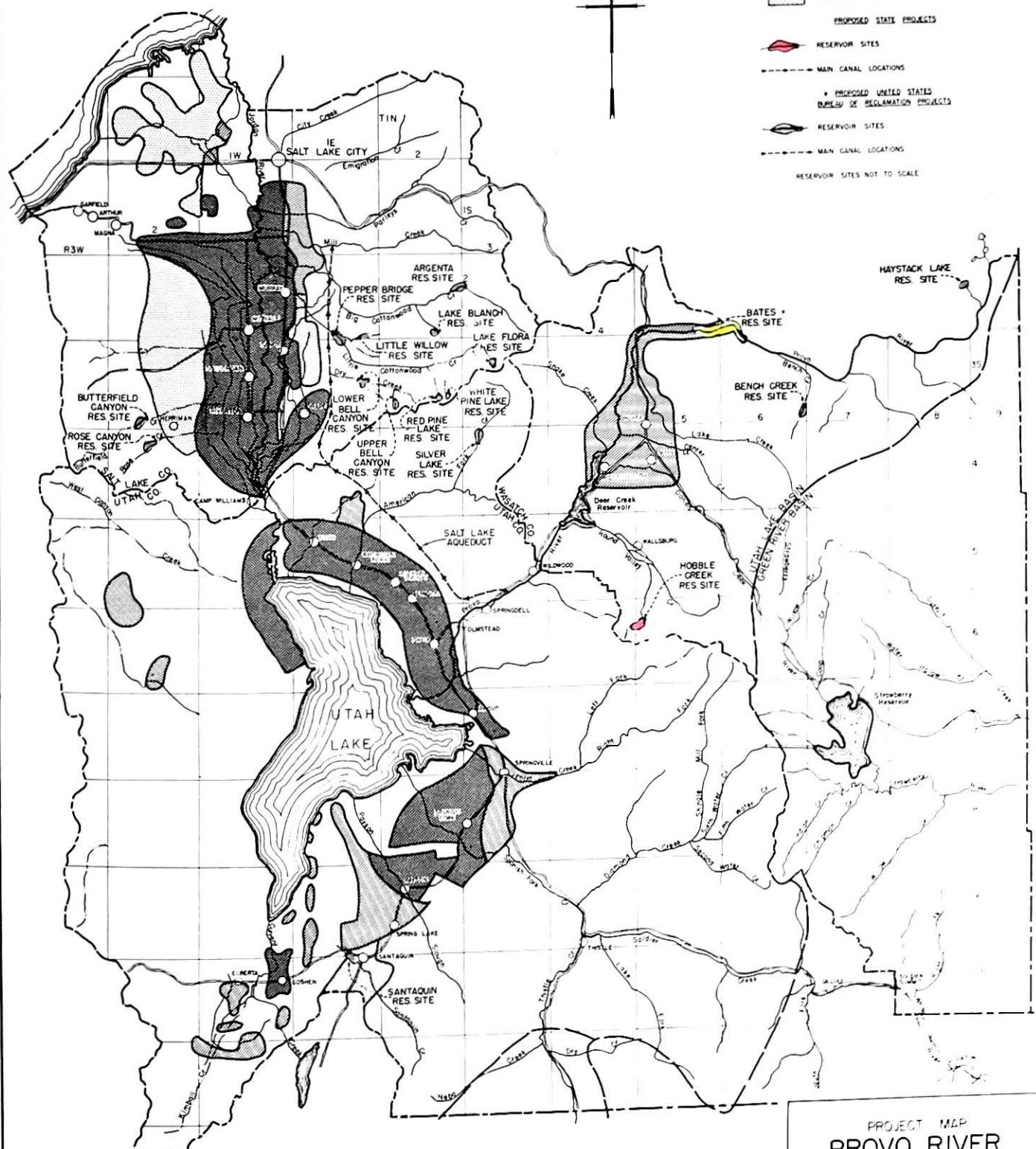
Davis County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects.)

(1) Reservoir Projects - - - - -	\$ 291,000
(2) Diversion and Conveyance Projects - -	\$ 396,000
	<u> </u>
TOTAL- - -	<u>\$ 687,000</u>

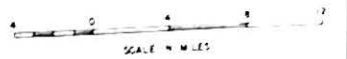
MAP 6

EXPLANATION

-  IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
-  IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
-  IRRIGABLE LANDS
-  PROPOSED STATE PROJECTS
-  RESERVOIR SITES
-  MAIN CANAL LOCATIONS
-  PROPOSED UNITED STATES BUREAU OF RECLAMATION PROJECTS
-  RESERVOIR SITES
-  MAIN CANAL LOCATIONS
-  RESERVOIR SITES NOT TO SCALE



PROJECT MAP
**PROVO RIVER
 UTAH LAKE
 DRAINAGE AREA**
 UTAH WATER AND POWER BOARD



SCALE IN MILES

SALT LAKE COUNTY

Introduction

Salt Lake County lies within the Utah Lake, Provo River, and Salt Lake Drainage Areas. The major streams that provide water for this county are Jordan River and Utah Lake, which are supplied from the Utah Lake-Provo River Drainage, and City, Emigration, Parley's, Mill and Big and Little Cottonwood Creeks, tributaries to Jordan River to Salt Lake.

The direct stream flow during the summer and fall irrigation season, on all streams are fully appropriated. Several storage reservoirs have been completed and a substantial percentage of the flood water appropriated and stored for irrigation, city water supplies, and industrial uses.

Additional storage of water in surface reservoirs and in underground reservoirs to the fullest extent practical, is of vital importance to the development of this area.

Present Storage Development

Numerous small reservoirs have been constructed on the head waters of the streams originating on the west slope of the Wasatch National Forest in Salt Lake County. With these, and Utah Lake and Deer Creek Reservoirs, there are 18 reservoirs serving Salt Lake County, some of which are very small, with a total storage capacity of about 431,000 acre-feet. Of this total, 273,600* acre-feet are available to Salt Lake County lands serving an estimated 59,600 acres.(1)

* An estimated 97 per cent of available storage, is supplied by Utah Lake and Deer Creek Reservoirs.

(1) Israelson, Maughn, and South, Irrigation Companies in Utah, p.28.

Supplemental Water Requirements

The total irrigated area in Salt Lake County amounts to about 68,500 acres. Supplemental water requirements for this area are estimated at 20,000 acre-feet.(1)

Potential New Land Development

It is hoped that the proposed Central Utah Project, currently being investigated by the Bureau of Reclamation, will provide additional supplemental water for the inadequately irrigated lands, and a full supply to arable lands in Salt Lake County.

Proposed Reservoir Projects

Ten potential projects are outlined for use of the water resources in Salt Lake County as proposed by the County Water Users.

Lake Flora Reservoir Project.- Little Cottonwood Water Company proposes to increase the capacity of Lake Flora from 60 to 180 acre-feet. This project will furnish supplemental water to approximately 250 acres of inadequately irrigated land under the Little Cottonwood Distribution System. Preliminary surveys have been made with an estimated construction cost of \$12,000.

Red Pine Lake Reservoir Project.- The Little Cottonwood Water Company proposes to increase the capacity of Red Pine Lake from 320 to 600 acre-feet. This project would furnish supplemental water to an estimated 480 acres of inadequately irrigated land under the Little Cottonwood Distribution System. Preliminary surveys have been made, with an estimated construction cost of \$22,000.

Pepper Bridge Reservoir Project.- The Little Cottonwood Water Company requests an investigation to determine the feasibility of impounding 1,400 acre-feet of water from Little Cottonwood Canyon in the Pepper Bridge site, located below the Murray City Power Plant. This project would provide supplemental water to 2,500 acres of inadequately irrigated land in the vicinity of Murray and Sandy, and would benefit approximately 4,000 people. Preliminary surveys have been made by the State Engineer's office, and also by private engineers. A reservoir of approximately 500 acre-feet capacity was estimated to cost approximately \$75,000. (2)

(2) Report by C. V. Gardner - 1936.

White Pine Reservoir Project.- The South Despain Irrigation Company proposes to enlarge and repair the existing reservoir to impound 200 acre-feet of water from White Pine Lake. This project will provide supplemental water to an estimated 400 acres of inadequately irrigated land in the vicinity of Granite, and would benefit about 50 families. Preliminary surveys have been made, with an estimated construction cost of \$30,000.

Upper Bell Canyon Reservoir Project.- The Draper Irrigation Company proposes to enlarge and repair the existing reservoir dam to safely impound 200 acre-feet. This project will furnish supplemental water to 1,200 acres of now inadequately irrigated land in the vicinity of Granite, Sandy, and Draper, and would benefit about 1,800 people. Preliminary reconnaissance and estimates have been made by the Utah Water and Power Board, with estimated construction cost of \$10,000.

Lake Blanch Reservoir Project.- Brown and Sanford Irrigation Company proposes to repair the present dam to successfully impound 335 acre-feet. This project will furnish supplemental water to 600 acres of inadequately irrigated land served by the sponsoring irrigation company. Investigations are in the reconnaissance stage only, with an estimated construction cost of \$17,000.

Little Willow Reservoir Project.- The Big Willow Irrigation Company requests engineering surveys to determine the feasibility of constructing a reservoir of 100 acre-feet capacity in Little Willow Canyon, to serve both as a culinary and irrigation project. There are about 200 people that would benefit from irrigation, and 160 people would benefit from the culinary system. An estimated 600 acres could receive supplemental water. No cost estimates are available.

Butterfield Canyon Reservoir Project.- The Herriman Irrigation Company proposes a reservoir in Butterfield Canyon. They request an investigation to determine the most feasible dam site, and also the feasibility of lining a porous reservoir. This project would provide supplemental water to 500 acres of inadequately irrigated land, and would benefit about 300 people. The estimated construction costs are not available.

Rose Canyon Reservoir Project.- The Rose Canyon Irrigation Company proposes a reservoir at some feasible location on Rose Canyon Creek. They request an investigation to determine the feasibility of such a project. Proposed capacities and estimated construction costs are not available.

Lower Bell Canyon Reservoir Project.- The Bell Canyon Irrigation Company proposes to enlarge and repair the existing reservoirs to a maximum capacity of 245 acre-feet. This reservoir is located 14 miles south and 5 miles east of Salt Lake City at the mouth of Bell Canyon. This project will provide supplemental water to 3,400 acres of irrigated land in the vicinity of Crescent and Draper, this acreage being the total served under the Bell Canyon's distribution systems. Surveys and estimated have been completed by the Utah Water and Power Board, with an estimated construction cost of \$29,900.

Note: This project has been approved by the Utah Water and Power Board, and construction was initiated during August 1948.

Argenta Reservoir Project.- Salt Lake County Water Users propose to construct a reservoir of 12,000 acre-feet capacity at a site on Big Cottonwood Creek. This project would benefit inadequately irrigated land in the southeast area of the county, and has been considered as a culinary project by the Salt Lake City Corporation. Preliminary surveys have been made; no costs estimated.

Summary

Table 19 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

Diversion and Conveyance Needs

There are 63 irrigation companies in Salt Lake County, of which 38 serve 300 acres or more of irrigated land, and 25 serve less than 300 acres. The total irrigated acreage in Salt Lake County amounts to about 68,500 acres.

The distribution systems serving this area consist of approximately 265 miles of main canals with an average intake capacity of 62 c.f.s., and 300 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 11 c.f.s.

Results of the survey show that 16 irrigation companies have proposed needed diversion and conveyance projects. The major needs relative to improvement and repair of the existing distribution systems in Salt Lake County are:

(1) Canal lining to prevent excessive seepage losses of available irrigation water, and to reduce the danger of water logging or seeping the land below leaky canal sections.

Results of present and past surveys of the distribution systems carrying water over the porous gravel bench show excessive conveyance losses due to porous canal material. It is observed that the general condition of the distribution systems are satisfactory with reference to diversion and control structures, with the greatest need being canal lining.

One culinary project is included, which is listed under pipe installation, and has been requested by the Granite Pipe Line Association. Listed in proposed reservoir projects under the Little Willow Reservoir, the total cost of the project will include a pipe line for a necessary culinary water system, which is included in the over-all project.

Summary

Table 20 summarizes the proposed projects, showing the name of the irrigation company, its source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 19

PROPOSED RESERVOIR PROJECTS IN SALT LAKE COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated		Area to be Benefited Acres
			Constr. Cost \$ Total	Acre-foot	
Argenta	Big Cottonwood	12,000	Investigation Required		
Butterfield Canyon	Butterfield Canyon Creek		Investigation Required		
Lake Flora	Little Cottonwood Creek	180**	12,000	100	250 s
Lake Blanch	Big Cottonwood Creek	335***	17,000	50	600 s
Lower Bell Canyon	Bell Canyon Creek	245**	29,900	122	500 s
Little Willow	Little Willow Creek		Investigation Required		600 s
Pepper Bridge	Little Cottonwood Creek	500	75,000	150	1,000 s
Rose Canyon	Rose Canyon Creek		Investigation Required		
Red Pine Lake	Little Cottonwood Creek	600**	22,000	78	500 s
Upper Bell Canyon	Bell Canyon Creek	200**	10,000	50	1,200 s
White Pine	Little Cottonwood Creek	200**	30,000	150	400 s
TOTAL****		<u>14,260</u>	<u>195,900</u>		<u>5,050 s</u>

* s - Supplemental supply to inadequately irrigated land; n - Full supply to new land.

** Enlarge present reservoir.

*** Repair existing dam.

**** Totals do not include estimated costs for the Argenta, Butterfield Canyon, Little Willow, and Rose Canyon Reservoir Projects.

TABLE 20

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS.

Name of Irrigation Company	Source of Supply	Project Description	Est. Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Granite Water Company	Springs	Replacement and extension of culinary system	7,000	Prel. Est.	23 families
Big Cottonwood Tanner Ditch	Big Cottonwood Creek Utah Lake	4.0 miles-canal lining 10 control-structures	61,500	"	1,860
Big Willow	Little Willow Creek	3,100 ft.-pipe installation 300 ft.-Siphon installation	11,600	"	250
Brown-Sanford	Big Cottonwood Creek	2.0 miles-canal lining 50 ft.-flume	30,000	"	2,000
Butler Ditch	Big Cottonwood Creek	2 miles-pipe installation	42,000	"	300
Cahoon-Maxfield	Little Cottonwood Creek	6.0 miles-canal lining 1.5 miles-canal realignment 15-control structures	98,500	"	3,200
Casto Spring	Casto Spring	0.5 miles-canal lining	5,000	"	260
Draper	Canyon Streams	8 miles-canal lining	42,000	"	4,600
Hill Ditch	Big Cottonwood Creek	1.0 miles-canal lining 0.38 miles-canal realignment 0.75 miles-canal repair	23,000	"	320

TABLE 20. PROPOSED DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Little Cotton- wood Tanner	Little Cotton- wood Creek Utah Lake	7.5 miles-canal lining 1-diversion dam 1-control structure	89,000	Prel. Est.	1,260
Lyn Ditch	Little Cotton- wood Creek Utah Lake	3.0 miles-canal lining	29,000	"	512
Nickle Ditch	Little Cotton- wood Creek Utah Lake	5.0 miles-canal lining	84,000	"	900
Sandy Canal	Utah Lake	2.0 miles-canal lining	36,000	"	1,800
Thompson Ditch	Little Cotton- wood Creek	3.0 miles-canal lining canal repairs	27,000	"	400
Union East Jordan	Little Cotton- wood Creek Utah Lake	1.0 miles-canal lining	15,000	"	1,500
Upper Canal	Big Cotton- wood Creek Utah Lake	6.0 miles-canal lining	45,000	"	2,400
TOTAL			<u>\$636,600</u>		<u>21,562</u>

Summary

Salt Lake County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects.)

(1) Reservoir Projects - - - - - \$195,900
(2) Diversion and Conveyance Projects - - \$636,600

TOTAL- - - - - \$832,500

U T A H C O U N T Y

Introduction

Utah County lies entirely within the Utah Lake Drainage area. The principal river is the Provo, whose head waters originate in Summit County, draining west through Wasatch County into the Utah Lake.

The major tributaries to the Utah Lake area, are American and Spanish Fork Rivers, and Hobble, Summit, and Current Creeks.

The total irrigated area in Utah County amounts to 115,000 acres. Of this total irrigated area, approximately 77,000 acres has a full supply. The total supplemental water requirements are estimated at 56,000 acre-feet.

Serving Utah County's lands are eight reservoirs with a total storage capacity of about 702,000 acre-feet. Of this total 424,000 acre-feet are available to Utah County lands, serving approximately 91,000 acres.

The United States Bureau of Reclamation has provided the majority of storage available for Utah County's land with the construction of the Strawberry and Provo River Projects, with a combined capacity of 402,500 acre-feet.

Potential New Irrigable Land Development

Storage developments proposed by the United States Bureau of Reclamation under the Central Utah Project will provide a large area of new land with a full supply, the amount of which will be forth coming in the Bureau of Reclamation's Report on this project. The proposed Utah Lake diking project will reclaim a large area, the amount depending upon the final location of the proposed dyke.

The Santaquin project which is being constructed by the Utah Water and Power Board will provide a full supply to 100 acres of new land in the vicinity of Santaquin.

Proposed Reservoir Projects

As referred to heretofore, the Bureau of Reclamation Projects will ultimately provide the major supplemental water requirements in Utah County. The Provo River Project as outlined will deliver supplemental water to 40,000 acres northwest of Provo.

The water users have proposed two reservoir projects, the Summit Creek and Silver Lake Flat Reservoirs. These are outlined as proposed.

Summit Creek Reservoir Project.- The Summit Creek Irrigation Company proposes to construct a reservoir of 831 acre-feet capacity at a site located one and a half miles west of Santaquin on Summit Creek. This project will provide supplemental water to about 3,000 acres of inadequately irrigated land, and a full supply to 100 acres of new land.

UTAH COUNTY

The population of Santaquin and vicinity, 1,360 people, will benefit from the completion of this project. Investigations and estimates were completed by the Utah Water and Power Board, and \$70,000 was approved for construction of this project.

Construction was initiated during the summer of 1948. Completion is anticipated early in 1949.

Silver Lake Flat Reservoir Project.- American Fork, Lehi, and Pleasant Grove Irrigation Companies propose a reservoir of 1,000 acre-feet capacity at a site on American Fork River. This project will provide a supplemental supply to 1,200 acres along the bench from Pleasant Grove to Lehi, and would benefit approximately 1,400 people. Preliminary surveys and estimates have been made, with an estimated construction cost of \$90,000. (Irrigation company estimates 1947 construction costs.)

Summary

Table 21 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 21

PROPOSED RESERVOIR PROJECTS IN UTAH COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost		Area to be Benefited Acres *
			Total	Acre-Foot	
Summit Creek	Summit Creek	831	\$70,000**	84	3,000 s 100 n
Silver Lake Flat	American Fork River	1,000	90,000	90	1,200 s
	TOTAL	<u>1,831</u>	<u>\$160,000.</u>	<u>87</u>	<u>4,200 s</u> <u>100 n</u>

- * s - Supplemental supply to inadequately irrigated lands.
- n - Full supply to new arable lands.
- ** - Estimated construction cost was \$92,000. However, only \$70,000 was advanced by the Utah Water and Power Board.

Diversion and Conveyance Needs

In Utah County there are approximately 62 irrigation companies serving an estimated 115,000 acres of irrigated land. The distribution systems serving this area consist of an estimated 336 miles of main canals with an average capacity of 50 c.f.s., and 348 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 20 c.f.s.

Utah County has been fortunate in receiving major benefits of two Bureau of Reclamation developments, the Strawberry and Provo River projects. This has resulted in extensive and efficiently operated distribution systems being constructed.

Results of the recent survey show that four irrigation companies proposed needed diversion and conveyance projects. The projects, as proposed, consist mainly of canal lining to prevent excessive conveyance losses, and also reduces operation and maintenance costs to a minimum.

Summary

Table 22 summarizes the proposed projects, showing the name of the irrigation company, its source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 22
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS.

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
American Fork River	American Fork River	4.0 miles main canal lining	\$105,000		5,253
		9 miles lateral canal lining	90,000		
Current Creek	Current Creek Mona Reservoir	6.0 miles canal lining	90,000		
		18 control structures			
		7.5 miles enlargement			
East Bench Canal	Spanish Fork River Strawberry Reservoir	2.0 miles canal lining	47,000		4,040
		1 Diversion Dam	15,000		

TABLE 22. DIVERSION AND CONVEYANCE NEEDS (CONTINUED).

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Pleasant Grove	American Fork and Provo River	2.5 miles main canal lining)	58,000		3,799
TOTAL			<u>\$405,000.</u>		<u>15,192</u>

Summary

Utah County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$160,000.
(2) Diversion and Conveyance Projects- - - - -	405,000.
TOTAL	<u>\$565,000.</u>

W A S A T C H C O U N T Y

Introduction

Wasatch County lies within the Provo River-Utah Lake drainage area. The major stream is the Provo River with Center, Daniel, Hobbie, Main and Lake Creeks being the principal sources of supply. There are also numerous mountain lakes that lie at the head waters of the Provo River drainage which provides late season water supply.

The total irrigated area in Wasatch County amounts to approximately 21,000 acres, with an estimated supplemental water requirement of 17,000 acre-feet.

Serving Wasatch County lands are a number of mountain lakes and one small reservoir. Approximately 7200 acre-feet of storage are available serving 6200 acres of land in this county.

The Bureau of Reclamation has constructed two large reservoirs, the Strawberry and Deer Creek with a combined capacity of 402,500 acre-feet which are located in Wasatch County but serve lands in Utah and Salt Lake Counties.

Proposed Reservoir Projects

Outlined are three reservoir projects which have been proposed by the county water users. In addition, one project is outlined as proposed by the Bureau of Reclamation which would provide the necessary supplemental water requirements for the inadequately irrigated areas in the vicinity of Heber.

Bench Creek Reservoir Project.- The Sunrise Irrigation Company proposes a reservoir of 125 acre-feet located on Bench Creek. This project would provide a supplemental supply to approximately 250 acres of inadequately irrigated land in the vicinity of Woodland, and would benefit approximately ten families. This project was also proposed in the "Utah Emergency Relief Report" of "Proposed Reservoirs in Utah". The estimated construction cost is \$16,000.

Hobbie Creek Reservoir Project.- The Hobbie Creek Irrigation Company proposes a reservoir of 1026 acre-feet capacity located at a site on Hobbie Creek, approximately six miles southeast of Wallburg. This project would provide a supplemental supply to an estimated 4000 acres of inadequately irrigated land in the vicinity of Wallburg and would benefit about 300 people. Preliminary surveys and cost estimates have been made by the State Engineer's Office, with an estimated construction cost of \$148,000.

Lake Haystack Reservoir Project.- The Timpanogos Irrigation Company proposes to convert the existing Lake into a reservoir with an estimated capacity of 50 acre-feet. This project would provide additional supplemental water to the 2249 acres of inadequately irrigated land served by the sponsors. Investigations are incomplete. The estimated construction cost is \$5,000.

U. S. Bureau of Reclamation Project

The U. S. Bureau of Reclamation proposes to construct the Bates Reservoir, which is located at a site on Provo River, about 7 miles north-east of Heber. This reservoir is included in the ultimate development of the Central Utah Project. Irrigation companies in the vicinity of Heber could receive their required supplemental supply from this development, and it would also serve Salt Lake and Utah Counties.

Summary

Table 23 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 23

PROPOSED RESERVOIR PROJECTS IN WASATCH COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost Total	Estimated Constr. Cost Acre-Foot	Area to be Benefited Acres*
Bench Creek	Bench Creek	125	16,000	128	250 s
Hobble Creek	Little Hobble Creek	1,026	148,000	144	4,000 s
Lake Haystack	Provo River	50	5,000	100	100 s
TOTAL		<u>1,201</u>	<u>169,000</u>	<u>140</u>	<u>4,350 s</u>

* - s Supplemental supply to inadequately irrigated lands.
 n Full supply to new arable lands.

Diversion and Conveyance Needs

There are 16 irrigation companies in Wasatch County serving approximately 21,000 acres of irrigated land. The distribution systems serving this area amounts to an estimated 98 miles of main canals with an average intake capacity of 62 c.f.s., and 8 miles of laterals over 4 c.f.s. capacity with an average intake capacity of 17 c.f.s.

The major diversion and conveyance improvements or replacements needed for the existing distribution systems, are canal repair and enlargements, and consolidation of parallel canals to reduce operation and maintenance costs, and to more efficiently apply the existing water supplies.

The Israelsen Survey shows a small amount of canal lining needed. However, at this date, the irrigation companies in the Wasatch County area have expressed their ability to finance through their own assessments, any needs relative to improvement of existing systems, with the exception of the Daniel's Irrigation Company and the Charleston Culinary Water Users.

The number one project which has been approved for investigation by the Utah Water and Power Board is the Charleston Culinary Pipe Line project. The proposed Charleston Water System provides for diverting through a pipe line, water from two springs in Soldier Hollow, to the town of Charleston, and also the lateral lay-out to the individual homes. The total cost of the project is estimated at \$73,000. Note: \$55,000 was approved by the Utah Water and Power Board towards completion of this project.

The second project which has been approved for investigation, is the Daniel's Creek Canal Project. Project plans call for the consolidation of the two canals diverting water from the Strawberry River and its tributaries into Danile's Canyon, and to enlarge the Willow Creek Canal to put the waters of the two canals into one. This project will benefit approximately 80 families living on farms irrigated by the waters of this company. The estimated cost of this project is \$35,000.

Summary

Table 24 summarizes the proposed projects, showing the name of irrigation company, its source of supply, type of project, estimated construction cost, and areas to be benefited.

TABLE 24
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Charleston Pipe Line	Springs	Culinary System	55,000*	Complete	63 families
Daniel's Creek Canal	Strawberry	Repair and enlargement canals	35,000	Prel. Est.	1,563
TOTAL			<u>90,000</u>		<u>1,563</u>

* Total cost estimated at \$73,000., and only \$55,000. was advanced by the Utah Water and Power Board toward completion of the project.

Summary

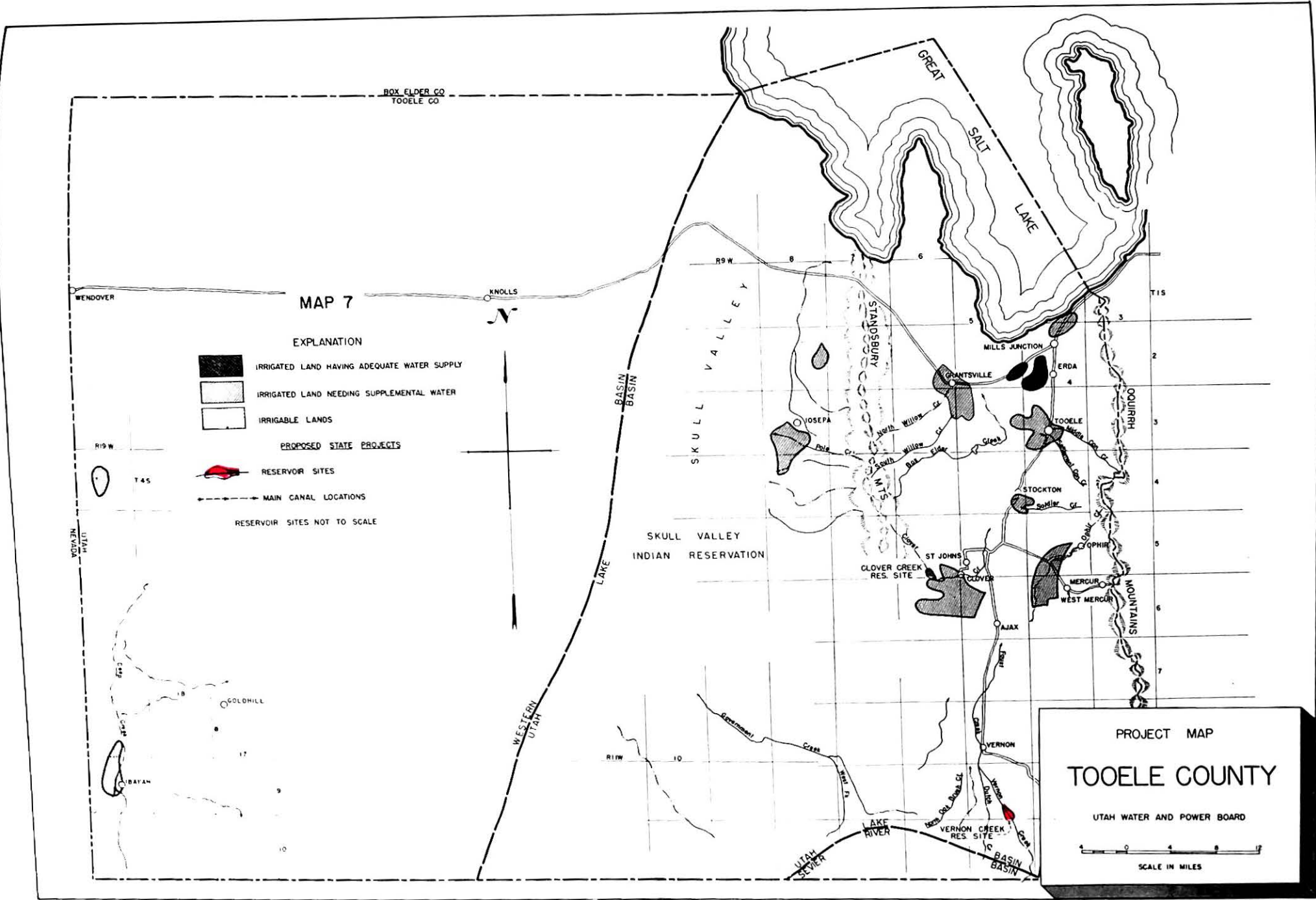
Wasatch County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation projects).

(1) Reservoir Projects - - - - - \$169,000.

(2) Diversion and Conveyance Projects- - - - 90,000.

TOTAL \$259,000.

(88)



TOOELE COUNTY

Introduction

Tooele County lies within the Salt Lake Minor Tributaries and the West Desert Drainage Areas. The present development of water resources are outlined under each area.

Salt Lake Minor Tributaries Drainage.- This area includes all of Tooele County except a small portion located in the southwest corner, which lies within the West Desert Drainage. The principal streams are located within Tooele Valley, bounded by the Oquirrh Mountains on the east, with Ophir, Settlement and Middle Canyon Creeks being the principal streams draining the west slopes of the Oquirrh Mountains, and Clover, North and South Willow Creeks being the principal streams, draining the east slopes of the Stansbury Mountains. On the south, Vernon Creek drains the north slope of the Onaqui Mountains located in the southeast portion of Tooele County. The area now irrigated amounts to approximately 7000 acres, requiring a supplemental supply estimated at 6000 acre-feet.

Several springs are located west of the Stansbury Mountains in the Skull Valley area, where irrigation developments are limited to a few ranches.

West Desert Drainage Area.- This area includes the southwest portion of the county, bounded on the east by the Deep Creek Range, and extending south into Juab County, and west into Nevada.

The principal stream is West Deep Creek, which serves approximately 1100 acres of irrigated land.

A number of private water users have ranches in this area. However, information as to the irrigated area and supplemental water requirements are not known.

Potential New Irrigable Land Development

There are extensive areas of arable land in Tooele County, and as to the amount that could be economically brought under irrigation by either underground water development or transbasin diversions, will depend upon future investigations, of which the proposed Central Utah project is potentially a source for new land development in the Rush Valley area.

Proposed Reservoir Projects

Two reservoir projects are outlined for possible development in the Salt Lake Drainage Area.

Vernon Creek Reservoir.- Vernon Creek Irrigation Company proposes a reservoir of 900 acre-feet capacity located at a site on Vernon Creek, approximately 7 miles south of Vernon. This site is one of two sites which have been investigated. The State Engineer's office has surveyed a site approximately 3 miles upstream, to impound 350 acre-feet at an estimated cost of \$67,000.

The Soil Conservation Service is making preliminary surveys of the proposed site, with an estimated construction cost of \$113,000. This project would provide a supplemental supply for an estimated 700 acres of inadequately irrigated land in the vicinity of Vernon, and would benefit about 35 families.

Clover Creek Reservoir Project.- Clover and St. John Irrigation Companies propose a reservoir of an estimated 620 acre-foot capacity, located at a site on Clover Creek about two miles west of Clover. This project would provide a supplemental supply to approximately 500 acres of inadequately irrigated land in the vicinity of Clover and St. John, and would benefit approximately 40 families.

The State Engineer's office have made preliminary surveys and estimates on one of two sites, with an estimated construction cost of \$225,000. The Soil Conservation Service is completing preliminary surveys on an alternate site in the same area. The estimated construction costs for the alternate site are not known.

Summary

Table 25 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 25
PROPOSED RESERVOIR PROJECTS IN TOOELE COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost		Area to be Benefited Acres*
			Total	Acre-Foot	
Vernon Creek	Vernon Creek	900	113,000	125	700 s
Clover Creek	Clover Creek	620	225,000	363	500 s
TOTAL		<u>1,520</u>	<u>338,000</u>	<u>222</u>	<u>1,200 s</u>

* - s Supplemental supply to inadequately irrigated lands.
 n Full supply to new lands.

Diversion and Conveyance Needs

There are fourteen irrigation companies in Tooele County serving approximately 8100 acres of irrigated land. The distribution systems that have been constructed to serve this area consist of 42 miles of main canal with an average intake capacity of 11 c.f.s., and 40 miles of laterals over 4 c.f.s. capacity with an average intake capacity of 9 c.f.s.

Results of survey of diversion and conveyance needs in Tooele County, show that eight irrigation companies have proposed needed distribution projects.

The first project approved for investigation and construction in Tooele County was the Settlement Canyon Pipe Line. It was the primary purpose of this project to save for irrigation, water that now wastes through seepage in the bed of the canyon, estimated at 2 c.f.s., by installing 6500 feet of 15 inch concrete pipe. Approximately 375 water users will benefit from this project. Investigations were completed by the Utah Water and Power Board in cooperation with the Soil Conservation Service, with an estimated construction cost of \$15,000. Project was completed during September, 1948.

Skull Valley Diversion Project.- The preliminary plan provides for the construction of a gravity canal diverting an estimated 30 c.f.s of water, from a spring located west of the Stansbury Mountains in Skull Valley, delivering irrigation water to lands lying in Tooele Valley, east of the Stansbury Mountains in the vicinity of Grantsville. Approximately 700 families would benefit from this development. Preliminary surveys and estimates are required.

Other projects in this county consists mainly of canal lining or pipe installation to conserve available irrigation water.

Summary

Table 26 summarizes the proposed diversion and conveyance projects, showing the name of irrigation company, its source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 26
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Lower and Upper Clover and St. John	Clover Creek	2.0 miles-canal lining 3-diversion dams	22,500	Prel. Est.	700
St. John	Clover Creek	2.0 miles-canal lining	18,000	"	300
Harker	Harker Creek	7.0 miles-canal lining	73,000	"	550
Ophir Creek *	Ophir Creek	7.0 miles-pipe replacement	80,000	"	350

TABLE 26. PROPOSED DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
South Willow	South Willow	5.0 miles-canal lining)	50,000)	Prel. Est.	1,000
Settlement Canyon	Settlement Canyon Creek	6600 ft.pipe installation)	**12,000)	Complete	500
		1.25 mile-pipe installation)	13,000)		
TOTAL			<u>331,500</u>		<u>3,900</u>

* - 60 per cent of water owned by U. S. Army Depot.

** - This portion of project was completed during summer of 1948.











Summary

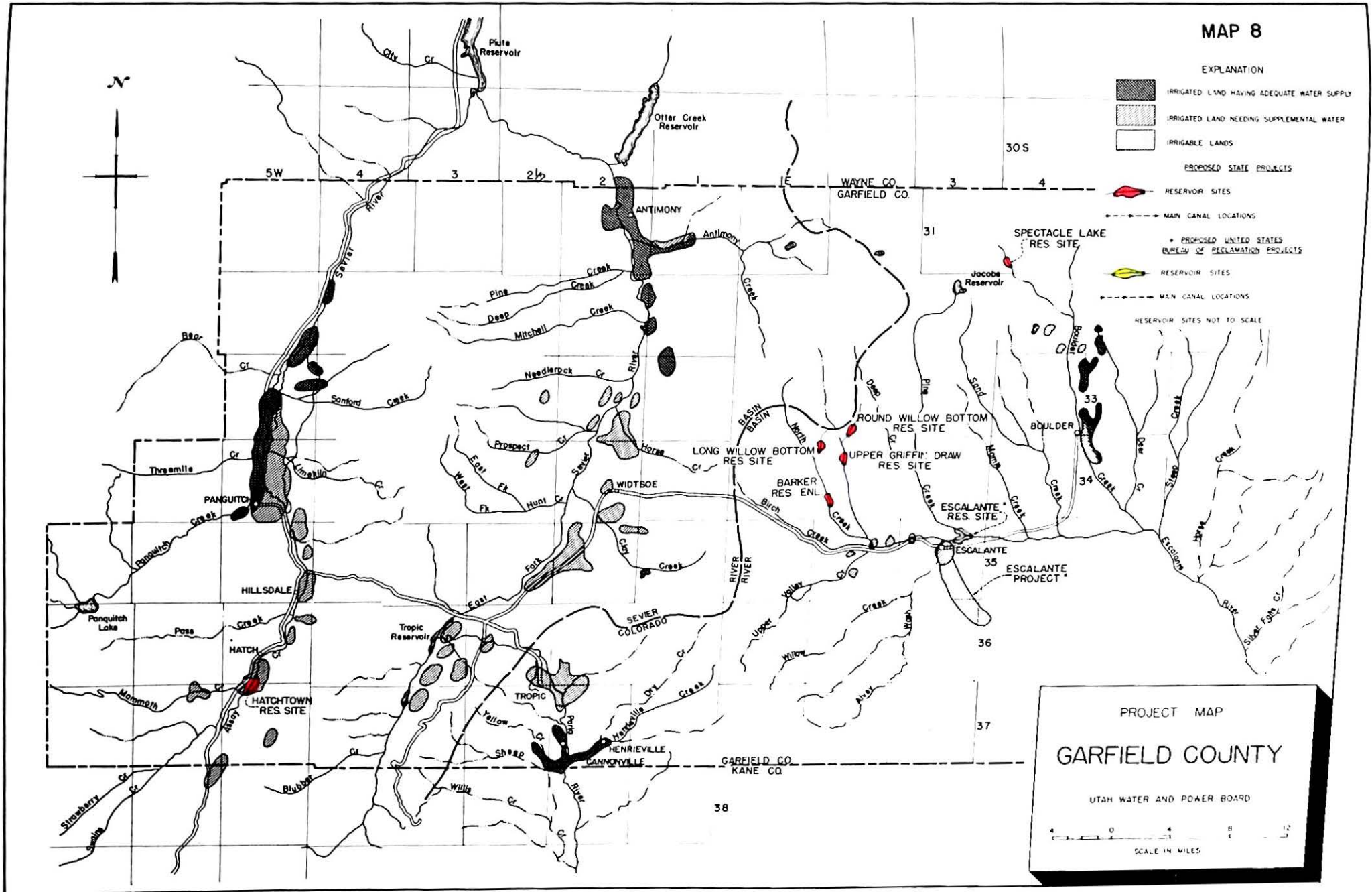
Tooele County's estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

- (1) Reservoir Projects - - - - - \$338,000.
 - (2) Diversion and Conveyance Projects- - - - - 331,500.
- TOTAL \$669,500.

MAP 8

EXPLANATION

-  IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
-  IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
-  IRRIGABLE LANDS
-  PROPOSED STATE PROJECTS
-  RESERVOIR SITES
-  MAIN CANAL LOCATIONS
-  PROPOSED UNITED STATES BUREAU OF RECLAMATION PROJECTS
-  RESERVOIR SITES
-  MAIN CANAL LOCATIONS
-  RESERVOIR SITES NOT TO SCALE



PROJECT MAP
GARFIELD COUNTY

UTAH WATER AND POWER BOARD

SCALE IN MILES

0 4 8 12

G A R F I E L D C O U N T Y

Introduction

Garfield County lies within the Sevier River, Escalante and Colorado River drainage areas. Present development of the water resources is outlined under each area.

(1) Sevier River Drainage Area. This area includes the head waters of the Sevier River, originating on the west slopes of the Dixie National Forest in the southwest part of Garfield County. It also includes the east fork of the Sevier River, which originates just west of the southern part of the Bryce Canyon National Park. It runs north to a junction with Otter Creek in Piute County, and then extends west to a junction with the main fork of the Sevier River at Kingston.

The principal tributaries to the Sevier River are Asay, Mammoth, and Panguitch Creeks. The total irrigated land in this drainage area amounts to about 15,000 acres, of which an estimated 4,000 acres require supplemental water.

The principal storage development consists of Panguitch Lake Reservoir, with a capacity of 18,500 acre-feet, located on the head waters of Panguitch Creek southwest of Panguitch. The Tropic Reservoir, located on the east fork of the Sevier River with a capacity of 2,360 acre-feet, is diverted to the Colorado River drainage area, serving in the vicinity of Tropic.

(2) Escalante River Drainage Area. This area is located on the east slopes of the Dixie National Forest. The principal tributaries are Birch, North, Calf, Pine, and Boulder Creeks, serving an irrigated area of approximately 6,200 acres, with an estimated supplemental requirement of 2,000 acre-feet. Present storage development in this area consists of three small reservoirs with a combined capacity of approximately 1,300 acre-feet, serving in the vicinity of Escalante and Boulder.

(3) Colorado River Drainage Area. This area includes the head waters of the Paria River, originating north of Tropic and extending south through Cannonville, into Kane County.

Approximately 3,400 acres of land are irrigated, a greater part of which requires supplemental water. Present reservoir development in this area consists of the Tropic Reservoir located on the head waters of the east fork of the Sevier River, and brought transmountain diversion into this area.

Proposed Reservoir Projects

Seven reservoir projects are outlined by drainage area. Included in this total, is the Escalante River Project as outlined by the Bureau of Reclamation.

Sevier River Drainage Area

One reservoir project is outlined for development in this area.

Panguitch Reservoir Project.- Garfield and Piute counties jointly propose to construct a reservoir of approximately 13,650 acre-feet capacity, located at some feasible site on the Sevier River above Panguitch. This project would provide supplemental water to inadequately irrigated land in Garfield and Piute counties. There are approximately 3,000 people that would benefit from this project. Investigations to determine the most feasible sites are being made. The estimated construction costs are not available.

Escalante River Drainage Area

Six reservoir projects are outlined in this drainage area.

Spectacle Lake Reservoir Project.- Boulder Irrigation Company proposed a reservoir of 1,238 acre-feet capacity located at a site on Boulder Creek about 15 miles northwest of Boulder. This project will provide supplemental water to an estimated 3,000 acres of inadequately irrigated land in the vicinity of Boulder, and would benefit about 40 families. Engineering and estimates have been completed with an estimated construction cost of \$32,000. Note: This project received approval by the Utah Water and Power Board in 1947, and final completion of the reservoir was made in August 1948.

Escalante Irrigation Company Reservoir Projects.- The Escalante Water Users propose four small reservoirs on the North Creek water shed. Each are outlined below.

- (1) Round Willow Bottom Reservoir, with a capacity of 105 acre-feet, and an estimated construction cost of \$10,000.
- (2) Long Willow Bottom Reservoir, with a capacity of 125 acre-feet, and an estimated construction cost of \$12,000.
- (3) Upper Griffin Draw Reservoir, with a capacity of 450 acre-feet, and an estimated construction cost of \$8,000.
- (4) Barker Reservoir Enlargement, proposed to increase the capacity of the present reservoir from 131 to 295 acre-feet with an estimated construction cost of \$12,000.

These developments will provide supplemental water to approximately 1,200 acres of inadequately irrigated land in the vicinity of Escalante, and would benefit about 1,000 people. The total estimated construction cost of the four units amounts to \$42,000.

It is the intent of the sponsors to construct one reservoir each year, thereby, completing the program within a four year period.

Bureau of Reclamation Projects

Escalante Reservoir Project.— The Bureau of Reclamation has made preliminary surveys relative to the proposed Escalante Reservoir Project. This development proposes to impound 25,000 acre-feet of water from the Escalante River and Pine Creek near Escalante, Utah. A full irrigation supply could be furnished to 3,000 acres southeast of Escalante. (1)

(1) Bureau of Reclamation, Colorado River Report, p. 146.

Summary

Table 27 summarizes the proposed reservoir projects showing the name of the reservoir, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 27

PROPOSED RESERVOIR PROJECTS IN GARFIELD COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost		Area to be Benefited Acres*
			Total	Acre-Foot	
<u>Sevier River Drainage</u>					
Panguitch	Sevier River	13,650	Investigation Required		8,400 s**
<u>Escalante River Drainage</u>					
Spectacle Lake	Boulder Creek	1,348	32,000	24	3,000 s
Long Willow Bottom	North Creek	215	12,000	56	(
Round Willow Bottom	North Creek	105	10,000	96	(1,200 s
Upper Griffin Draw	North Creek	450	8,000	18	(
Barker Reservoir Enlargement	North Creek	295	12,000	41	(
	TOTAL***	<u>15,963</u>	<u>\$74,000</u>	—	<u>12,600 s</u>
<u>Bureau of Reclamation Project</u>					
Escalante River	Escalante River Pine Creek	25,000			3,000 n

* s - Supplemental supply to inadequately irrigated lands.

n - Full supply to new arable lands.

** - Area includes Piute and Garfield Counties.

*** - Total estimated costs do not include the Panguitch Reservoir Project.

Diversion and Conveyance Needs

There are 20 irrigation companies in Garfield County serving approximately 23,000 acres of irrigated land. The distribution systems serving this area consist of an estimated 112 miles of main canals with an average intake capacity of 26 c.f.s., and 9 miles of laterals over 4 c.f.s capacity, with an average intake capacity of 7 c.f.s.

Results of the survey to determine the diversion and conveyance needs in Garfield County, show that seven irrigation companies have proposed needed distribution projects.

The major problems confronting the canals located in the Henrieville and Cannonville areas located on the head waters of the Paria River are:

(1) Repair or replacement of the existing diversion dams which consist mainly of dirt, logs, and rocks, which are temporary, and at best difficult to control the amount of diversions.

(2) Also, there is a need of replacement or repairs of existing flumes across deep washes caused by excessive erosion.

(3) Relocation of certain sections of the main distribution systems to increase the capacity and efficiency of the irrigation systems.

The major needs outlined in the Panguitch area are enlargement and realignment of existing canals.

Summary

Table 28 summarizes the proposed diversion and conveyance needs for Garfield County's distribution systems, showing the name of the irrigation company, source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 28
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Area
Cannonville	Paria River	0.1 mile-canal) lining) 3.0 miles-canal) enlargement) and repairs)	\$ 2,400	Prel. Est.	760
Clover Flat	Sevier River	0.5 mile-canal) enlargement)	700	"	700

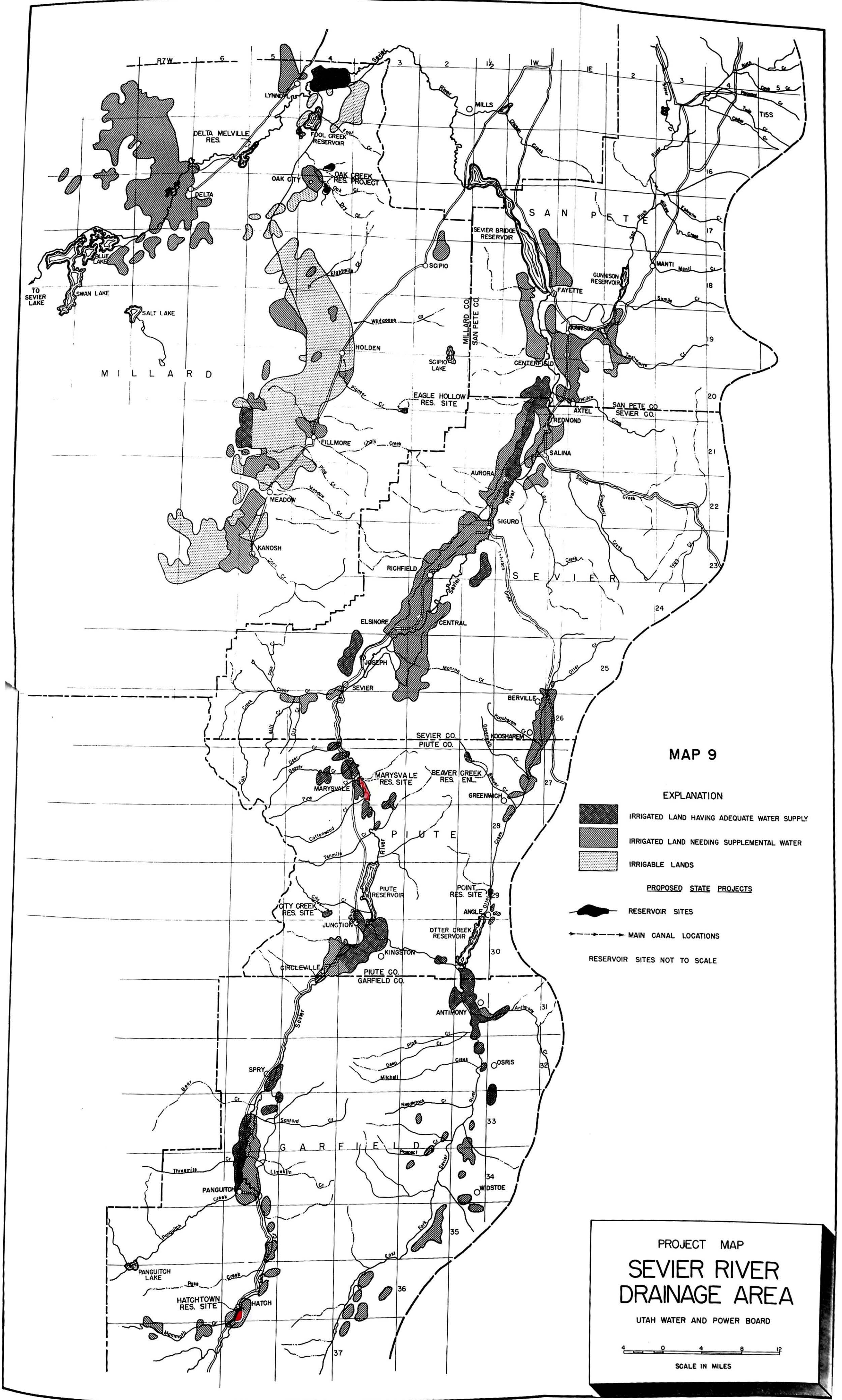
TABLE 28. PROPOSED DIVERSION AND CONVEYANCE NEEDS - (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Coyote East Fork	East Fork Sevier River	4.0 miles-canal lining)	20,000	Prel.	1,760
East Bench	Sevier River	2.0 miles-canal lining) 100 ft.-flume replacement) 1-diversion dam)	22,000	"	700
Hatch	Mammoth Creek Sevier River	0.25 mile-canal lining) 3.0 mile-canal enlargement) 50 ft - flume replacement) 1-diversion dam) repairs) 2-control structures)	3,000	"	700
Henrieville	Henrieville Creek	300 ft - flume	1,300	"	700
West Panguitch	West Fork Sevier River Panguitch Creek	0.25 mile-canal lining) 5 miles-canal realignment and enlargement) 5-control structures)	12,400	"	3,000
TOTAL			<u>\$61,800</u>		<u>8,320</u>

Garfield County Summary







Garfield county's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$ 74,000
(2) Diversion and Conveyance Projects - - - - -	<u>61,800</u>
TOTAL	<u>\$135,800</u>



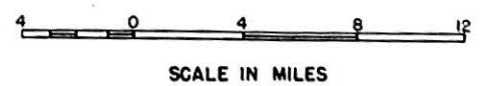
MAP 9

EXPLANATION

-  IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
-  IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
-  IRRIGABLE LANDS
-  PROPOSED STATE PROJECTS
-  RESERVOIR SITES
-  MAIN CANAL LOCATIONS
- RESERVOIR SITES NOT TO SCALE

**PROJECT MAP
SEVIER RIVER
DRAINAGE AREA**

UTAH WATER AND POWER BOARD



PIUTE COUNTY

Introduction

Piute County lies entirely within the Sevier River drainage area. The principal stream is the Sevier River, with the west fork and east fork of the Sevier River joining two miles north of Junction. The principal tributaries are Otter, Beaver, and City Creeks.

Irrigated lands in Piute County amounts to about 10,400 acres, of which an estimated 5300 acres have a full supply. The supplemental water requirements for inadequately irrigated lands are estimated at 7800 acre-feet.

Present storage developments within the county consist of four reservoirs with a total capacity of about 122,000 acre-feet. The Piute and Otter Creek Reservoirs provide 121,000 acre-feet of the total storage, the majority of which serves land in Sevier County.

Proposed Reservoir Projects

Four different reservoir projects are outlined for future possible development, the major controlling feature being available water supply.

Beaver Creek Reservoir Project.— The Beaver Creek Irrigation Company proposes to increase the capacity of an existing reservoir on Beaver Creek from 463 to 1463 acre-feet, storing the waters of Beaver Creek. This project would furnish a supplemental supply to an estimated 2000 acres in the vicinity of Greenwich. There are about 14 families that would benefit from this project. Preliminary surveys and cost estimates have been made by the Soil Conservation Service. The estimated construction cost is \$46,000.

Panguitch Reservoir Project.— (This project is outlined in the Garfield County Report, which proposes direct benefits to Garfield and Piute Counties).

Point Reservoir Project.— The water users in the vicinity of Angle request an investigation to determine the feasibility of a reservoir with a capacity of 5000 acre-feet just north of Angle on Otter Creek. This project would supply supplemental water to an estimated 600 acres of inadequately irrigated land, and 1200 acres of new land in the vicinity of Angle. There are about 10 families that would benefit from this project. Investigations are required to determine the estimated construction cost.

City Creek Reservoir Project.— City Creek Water Users propose a reservoir of 500 acre-feet capacity located on an offstream site, using the waters from City Creek for storage. The proposed development outlines both Power and Irrigation benefits. An estimated 500 acres of inadequately irrigated land would receive a supplemental water supply in the vicinity of Junction, and about 80 families would benefit from the project. Some preliminary reconnaissance has been made by the Soil Conservation Service, and more detailed investigations are required to determine the feasibility and cost estimates.

Summary

Table 29 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 29
PROPOSED RESERVOIR PROJECTS IN PIUTE COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Total	Cost Acre-Foot	Area to be Benefited Acres*
Beaver Creek	Beaver Creek	1,463**	46,000	46	2,000 s
Panguitch	Sevier River	See Garfield County Report			
Point	Otter Creek	5,000	Investigation Required		600 s 1,200 n
City Creek	City Creek	500	Investigation Required		500 s
TOTAL		<u>6,963</u>	Not Complete		<u>3,100 s</u> <u>1,200 n</u>

* s - Supplemental supply to inadequately irrigated lands.
n - Full supply to new lands.

** - Enlarge existing reservoir from 463 to 1463 acre-feet.

*** - Total cost does not include Point and City Creek Reservoir Projects.

Diversion and Conveyance Needs

There are twelve irrigation companies in Piute County serving approximately 10,400 acres of irrigated land. The distribution system serving this area consists of approximately 27 miles of main canals with an average intake capacity of 20 c.f.s., and 4 miles of laterals over 4 c.f.s capacity with an average intake capacity of 6 c.f.s

Results of the survey regarding diversion and conveyance needs in Piute County, show that 11 irrigation companies have proposed needed distribution projects. The proposed projects indicate a general need of repair and replacement of diversion structures, canal repairs and alterations, and canal lining.

The first project approved for investigation by the Utah Water and Power Board in this county, was the Bullion Creek Pipe Line. This project calls for the installation of approximately 1,320 linear feet of 30 inch pipe, located in the old canal section to serve two purposes. One, the primary purpose, is to stabilize the canal section which in the past, has caused considerable maintenance and repair during the irrigation season

from seeps and slides; and two, to reduce conveyance losses through this area. This project is being sponsored by the Bullion Creek Irrigation Company of Marysvale. The estimated construction cost is \$15,000.

Measurements to determine the conveyance losses on City Creek, west of Junction have been made. Results of these measurements show approximately a 50 per cent loss in a section two miles long. This indicates that great need to save existing water by lining or piping the available supply to the lands that are to be served.

These measurements were taken through the assistance of the Piute County Agricultural Agent.

Summary

Table 30 summarizes the proposed diversion and conveyance needs for Piute County's distribution systems, showing the name of the irrigation company, source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 30
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Angle	Otter Creek	1-diversion dam) 16-control struc-) ture	\$ 6,000	Prel. Est.	1,500
Beaver Creek	Beaver Creek	1-diversion dam)	500	"	2,000
Circleville) Kingston) Thompson) West Canal)	Sevier River	1-diversion dam) replacement)	22,000	"	4,300
City Creek	City Creek	5 miles-canal) lining	40,000	"	550
Howes Ditch	Sevier River	700 ft. flume) 4 miles-canal en-) largement	5,100	"	350
Henrie Bro's.	Manning & Dry Creek	1 mile-canal) lining) 4-diversion dams) 25-control structures)	11,100	"	1,000

TABLE 30. DIVERSION AND CONVEYANCE NEEDS (CONTINUED).

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Marysvale	Bullion Creek	1,320 ft. pipe installation	) 15,000	Prel. Est.	1,158
Junction	Sevier River Michells Springs	1-diversion dam	) 88,000	"	1,300
TOTAL			<u>\$107,700.</u>		<u>12,158</u>

Summary

Piute County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - - \$ 46,000*

(2) Diversion and Conveyance Projects- - - - - 107,700.

TOTAL \$ 153,700.

* Total does not include the estimated cost of the proposed Point and City Creek Reservoir Projects.

SEVIER COUNTY

Introduction

The great part of Sevier County lies within the Sevier River Drainage Area. The principal stream and source of supply is the Sevier River, with the major tributaries from south to north, being Clear, Monroe, Peterson, Lost, and Salina Creeks. The extreme eastern part of the county lies within the Fremont and Muddy River drainage areas, and is not included in this report, because of the negligible area of irrigated land lying in these areas.

Approximately 56,400 acres are irrigated in Sevier County. Of this total 30,000 acres are estimated to require additional supplemental water.

It is generally assumed that the waters of the Sevier River are very well corralled, and present facilities are sufficient to impound all the water yielded by the river the entire year, except what is needed for irrigation during the irrigation season. It is only on very rare occasions that any water is allowed to waste on account of lack of storage facilities.

Serving Sevier County lands are eight reservoirs with a total storage capacity of 132,000 acre-feet. Of this total 129,000 acre-feet are available, serving 47,450 acres within Sevier County.

Proposed Reservoir Projects

Reservoirs that are supplying storage water to the Sevier County lands are decreasing in capacity, due to siltation of the existing reservoir basins. As an example, the rated capacity in 1937 of the Piute Reservoir was 84,000 acre-feet, and in 1942 the capacity had decreased to 74,000 acre-feet. (1)

(1) Ogden J. L. and Coal W. C., Annual Report of the Sevier River, years 1937 - 1945.

As a result of the decreased storage capacity, the Sevier County Water Users are looking elsewhere for new reservoir sites to impound existing storage rights. Two different sites have been proposed to replace lost storage capacities in existing reservoirs.

Hatchtown Reservoir Project.- The Piute Reservoir and Canal Company proposed a reservoir of an estimated 12,000 acre-foot capacity, located at Hatchtown Reservoir Site, near Hatch, Utah, on the South Fork of the Sevier River. Storage would be used as a supplemental supply for the 14,000 acres now irrigated by this company. Preliminary surveys are being made by the Soil Conservation Service at the Hatchtown site, and other sites on the River. Estimated construction costs have not been made.

Marysvale Reservoir Project.- The Otter Creek Reservoir water users propose an investigation of the Marysvale Reservoir site, located near Marysvale, Utah. This project calls for change of storage to replace lost storage due to siltation in their existing reservoirs. No investigations have been made. Estimated construction cost not available.

Summary

Table 31 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 31
PROPOSED RESERVOIR PROJECTS IN SEVIER COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost Total	Area to be Benefited Acres*
Hatchtown	Sevier River	12,000	Investigation Required	14,000 s
Marysvale	Sevier River	- - - -	Investigation Required	20,000 s
	TOTAL	<u>12,000</u>		<u>34,000 s</u>

* s - Supplemental supply to inadequately irrigated lands.
n - Full supply to new arable lands.

Diversion and Conveyance Needs

There are 24 irrigation companies in Sevier County, serving about 56,400 acres of irrigated land. The distribution systems serving this area consists of approximately 294 miles of main canals with an average intake capacity of 62 c.f.s., and 325 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 6 c.f.s.

Results of the survey of diversion and conveyance needs in Sevier County show that 15 irrigation companies have proposed needed distribution projects. Fourteen of these are for irrigation, and one is for culinary purposes.

The general condition of the Sevier County distribution systems are good. With the development of storage on the Sevier River, an extensive distribution system was constructed and generally maintained satisfactorily.

The major needs relative to improvements and repairs of the existing distribution systems in order of importance are:

(1) Canal lining to prevent excessive seepage losses, and to reduce the danger of water logging and seeping land.

(2) Permanent repair or new construction of diversion dams.

(3) Canal repairs and alterations, and replacement of control structures. This need is generally taken care of by annual operation and maintenance costs.

Summary

Table 32 summarizes the proposed diversion and conveyance needs for Sevier County's distribution system, showing the name of the irrigation company, source of supply, project description, estimated construction cost, status of investigation, and areas to be benefited.

TABLE 32
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Brooklyn Canal	Sevier River	4.0 miles canal lining	80,000	Prel. Est.	1,500
Elsinore Canal	Jericho Wells North & South Cedar Ridge	1 diversion dam 2.0 miles canal lining 1 control structure	9,000 15,500	"	1,200 2,000
Central Water Works	Springs	Replacement and repair of culinary system	40,000	"	70 people
Koosharem	Otter Creek Koosharem Reservoir	2.5 miles canal lining	18,000	"	1,500
Monroe	Sevier River Otter Creek Reservoir Piute Reservoir	1 diversion dam 1 control structure	2,700	"	2,500
Redmond	Redmond Lake	2.0 miles canal lining 1 diversion dam	21,000	"	1,500
Richfield	Cottonwood	0.75 mile canal lining	11,800	"	350

TABLE 32. PROPOSED DIVERSION AND CONVEYANCE NEEDS (CONTINUED).

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Cottonwood	Canyon	1 diversion dam	) 4,000	Prel. Est.	
Richfield	Sevier River Otter Creek Reservoir Piute Reservoir	1 diversion dam	) 20,000	"	7,000
South Bend	Monroe Creek	0.5 miles canal lining	) 5,000	"	400
Extension	Sevier River Otto Creek Reservoir	1200 ft. flume	) 4,000	"	
Lost Creek	Lost Creek	1.5 miles canal alterations 21 control structures 1 diversion dam	) 3,200	"	2,600
Venice Pumping	Cove River	0.75 miles canal lining 5 control structures	) 5,500	"	390
Vermillion Extension Canal	Sevier River Otter Creek Reservoir	3.5 miles-canal lining 40 control structures	) 37,600	"	300
Street Pipe Line	Dry Creek Monroe Creek	1.25 miles pipe installation	) 6,500	"	700
TOTAL			<u>\$284,000.</u>		<u>20,740</u>

Summary

Sevier County's total estimated cost for the proposed distribution and storage development.

- (1) Reservoir Projects - - - - - Investigation Required
- (2) Diversion and Conveyance Projects - - - \$284,000.

TOTAL \$284,000.

MILLARD COUNTY

Introduction

Millard County lies within the Sevier River and the West Desert Drainage areas. The present development of water resources is outlined under each area.

Sevier River Drainage Area

This area includes the east half of Millard County which contains the following divisions:

Delta and Central Utah Area.- Within this area, approximately 48,000 acres of land are under irrigation, served by the Sevier River direct flow and supplemented by storage, which includes the Sevier Bridge Reservoir with a capacity of 236,000 acre-feet, Fool Creek Reservoir with a capacity of 10,000 acre-feet, and Gunnison Bend Reservoir with a capacity of 4,000 acre-feet.

East Bench Area.- The area from Oak City south to Kanosh along the foot hills includes approximately 12,000 acres of irrigated land, all in need of a supplemental supply. This area is supplied by small mountain streams with their head waters draining the west slopes of the Canyon Mountains, in the Fish Lake National Forest.

A study of the stream flow characteristics in this area shows a high spring run-off of melting snow, which usually ends in May and June. The stream then reduces rapidly and a serious shortage of irrigation water exists during the remainder of the growing season. Storage development along the west slopes of the Fish Lake National Forest is negligible.

Scipio Area.- Approximately 1,500 acres of irrigated land located in the north east corner of the county in the vicinity of Scipio are served by Round Valley Creek, and supplemented by storage from Scipio Lake. Supplemental requirements for this area are estimated at 1,000 acre-feet.

West Desert Drainage Area

This area includes the west portion of Millard County. Approximately 2,800 acres within this area are irrigated in the vicinity of Garrison and Burbank. Snake Creek and Warm Springs are the principal sources of supply, with supplemental water provided by the Garrison Reservoir, with a storage capacity of 5,000 acre-feet. The supplemental water requirements are, for this area, estimated at 1300 acre-feet.

Potential New Irrigable Land Development

Potential irrigation development would provide a full supply to a large area of irrigable lands extending from Oak City along the base of the mountains south to Kanosh. The potential source for the required water supply would come from the proposed Central Utah Project, which is currently being investigated by the Bureau of Reclamation.

Proposed Reservoir Projects

Two small reservoir projects are outlined for storage development in Millard County. The proposed storage will provide 475 acre-feet, which will benefit 900 acres of inadequately irrigated land.

Steep Canyons, where water might be available for storage has made it difficult to construct reservoirs on the majority of small streams in this county.

Oak Creek Reservoir Project.- Oak Creek Water Users propose three small reservoirs, with a combined capacity of 300 acre-feet to be supplied from waters of Oak Creek by feeder canals. One reservoir is located just north of Oak Creek, and two reservoir sites are located just south of Oak Creek. This project would provide supplemental water to lands served by the Oak Creek Irrigation Company. There are about 80 families that would benefit from this development. Investigations have been made on Oak Creek with an estimated cost of \$474. per acre-foot. The water users feel that the best sites are located on the above mentioned off-stream sites, which require investigations.

Eagle Hollow Reservoir Project.- The Holden Water users propose a reservoir of 175 acre-feet capacity at a site on Pioneer Creek. This project would provide a supplemental supply to 300 acres of inadequately irrigated land in the vicinity of Holden. There are about 500 people that would benefit from this development. Preliminary surveys and estimates have been made by the State Engineer's office, with an estimated construction cost of \$31,000.

Summary

The following table summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 33
PROPOSED RESERVOIR PROJECTS IN MILLARD COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost		Area to be Benefited Acres*
			Total	Acre-Foot	
Oak Creek	Oak Creek	300	Investigation Required		600 s
Eagle Hollow	Pioneer Creek	175	31,000	175	300 s
	TOTAL**	<u>475</u>	<u>\$31,000</u>	<u>175</u>	<u>900 s</u>

* s - Supplemental supply to inadequately irrigated lands.
** - Note: Total Cost does not include Oak Creek Project.

Diversion and Conveyance Needs

There are 19 irrigation companies in Millard County serving 63,000 acres of irrigated land. The distribution systems serving this area consist of an estimated 152 miles of main canals with an average intake capacity of 139 c.f.s., and 190 miles of laterals over a 4 c.f.s. capacity, with an average intake capacity of 16 c.f.s.

Results of the survey show that six irrigation companies have proposed needed Diversion and Conveyance Projects. The major needs that exist in this county; the Delta area in particular, is canal lining to reduce the excessive conveyance losses. In addition to permanently losing irrigation water, seepage is causing a rising of the water table, thus increasing drainage costs, reducing crop production, complicates the alkali problem and generally threatens the permanence of agriculture.

The Agricultural Experiment Station of the Utah State Agricultural College has investigated the problem of canal lining and drainage in this area, and has published Bulletin 312, (Technical) entitled "Canal Lining Experiments in the Delta Area".

This Bulletin analysis canal seepage losses for the different canals in the Delta Area. Results of average seepage losses for the season 1940 and 1941, on a section of Melville Canal, showed an average five per cent conveyance loss per mile. (1)

(1) Israelsen, Reeve, Canal Lining Experiments, P.12, Bulletin 313.

Summary

The following table summarizes the proposed projects, showing the name of irrigation company, its source of supply, project description, estimated construction cost, status of investigation, and areas to be benefited.

TABLE 34
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Eight Mile	Eight Mile Creek	6.0 miles-pipe installation)	60,000	Prel. Est.	1,350
Fool Creek	Springs	2.0 miles-canal lining) 1-Diversion Dam)	15,000	"	600

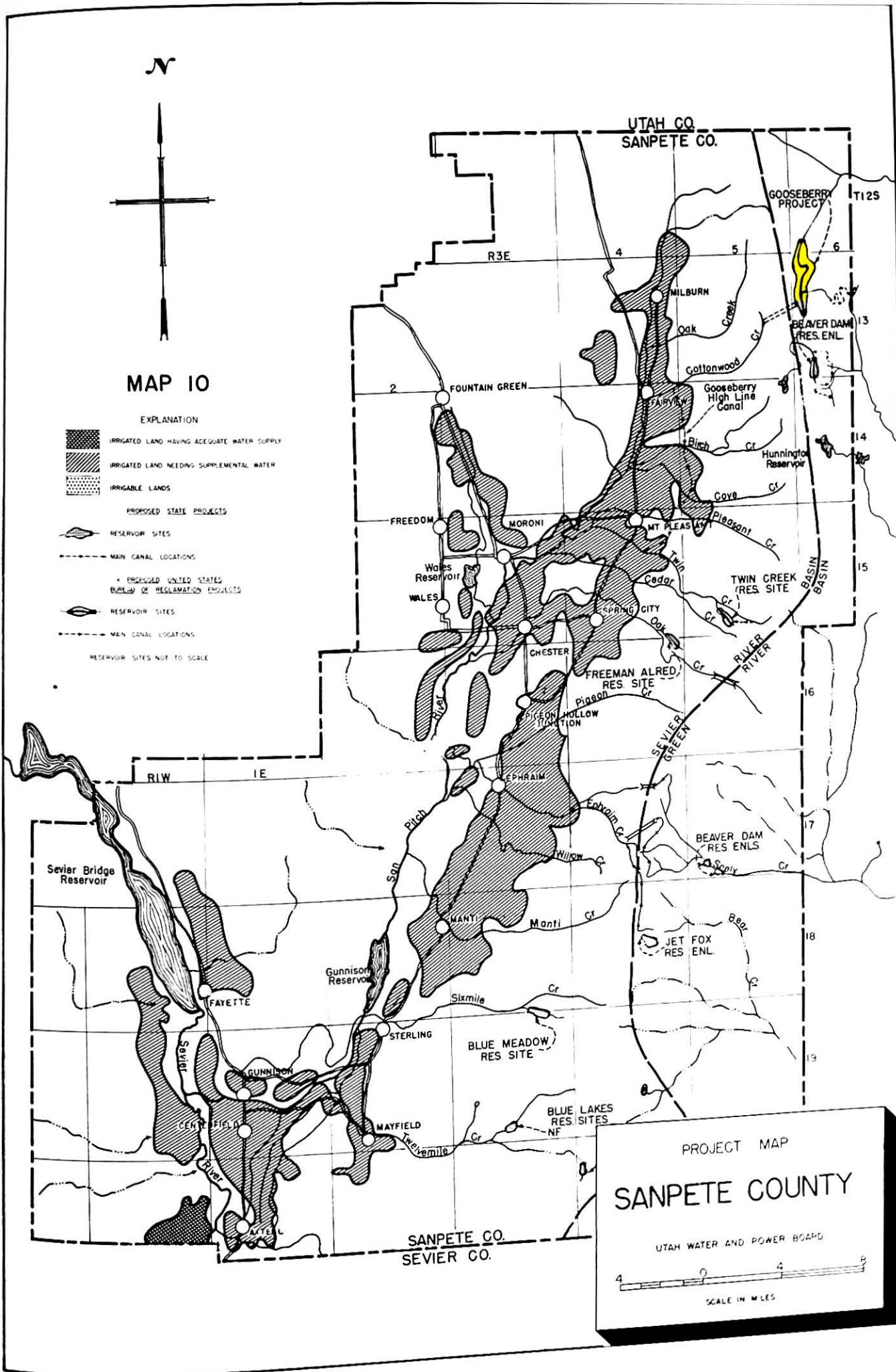
TABLE 34. DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Melville	Sevier River Sevier Bridge Reservoir	9 miles-canal lining)	262,000	Prel. Est.	6,900
Meadow	Meadow Creek	1 mile-canal lining)	12,000	"	1,800
Oak Creek	Oak Creek	3.5 miles-canal) lining) 50 ft.-flume) 19-control) structures)	27,500	"	1,800
Warm Creek	Natural Springs	2.0 miles-canal) lining) 2.0 miles-canal) repair and al-) terations) 6-control) structures)	13,800	"	3,200
TOTAL			<u>\$390,300.</u>		<u>15,710</u>

Summary

Millard County's total estimated cost for the proposed distribution and storage developments, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$ 31,000.
(2) Diversion and Conveyance Projects- - - - -	390,300.
TOTAL	<u>\$ 421,300.</u>



SANPETE COUNTY

Introduction

Sanpete County lies within the Sevier River Drainage Area. The two major streams are the Sevier River flowing through the southwest section of Sanpete County, and the San Pitch River, with its head waters originating in the northeast section of the county draining the west slopes of the Wasatch Range and flowing southwest, making a junction with the Sevier River, west of Gunnison.

A number of tributaries draining the west slopes of the Manti National Forest from north to south are Oak, Cottonwood, Birch, Cove, Pleasant, Twin, Cedar, Canal, Pigeon, Ephraim, Willow, Manti, Six Mile, Nine Mile, and Twelve Mile Creeks. All of these tributaries have a relatively small drainage area, with the resulting high spring run off, and a very low flow during the latter part of the irrigation season.

There are twelve active diversions diverting water from the Colorado River Basin into Sanpete County, extending from Fairview south to Ephraim. Nine diversions are transmitted by canals and three by tunnels, the Ephraim, Larsen, and Spring Creek Tunnels.

It is evident that the greater source for supplemental water for the east side of Sanpete County must come through transmountain diversions from the Colorado River Basin.

The total irrigated area in Sanpete County is approximately 88,550 acres, requiring an estimated supplemental supply of 62,500 acre-feet. Lands along the east side of Sanpete County, with the exception of some areas bordering the San Pitch River, are in a dire need of supplemental water.

The potential source for part of the total supplemental requirements will come through transmountain diversions, from the east side of the Manti National Forest, in the San Rafael and Price River drainage areas. Also, it is assumed that ultimate development of the proposed Central Utah Project will allow increased use of storage and diversions upstream to benefit lands along the Sevier River.

Present storage development has provided an estimated 36,900 acre-feet which serves approximately 37,800 acres within Sanpete County.

Proposed Reservoir Projects

In providing additional water for Sanpete County as mentioned heretofore, the majority of the available water must come from transmountain diversions originating in the Colorado River Drainage.

Seven reservoir projects are outlined for development to serve directly or by exchange the inadequately irrigated lands of Sanpete County; and one, the Gooseberry Project, is mentioned as outlined by the Bureau of Reclamation.

The proposed reservoir developments (not including the U.S.B.R. Projects) would create 3,305 acre-feet of storage to provide supplemental water to the

inadequately irrigated lands bordering the east side of Sanpete County.

Blue Meadow Reservoir Project.- The Sterling Irrigation Company proposes a reservoir of 100 acre-foot capacity at a site on Six Mile Creek. The project would provide supplemental water to an estimated 300 acres of inadequately irrigated land, and approximately 450 people would benefit from the additional storage provided. Preliminary surveys have been made by the State Fish and Game in the interest of propagating fish life, with an estimated construction cost of \$10,000.

Blue Lakes Reservoir Project.- The Gunnison and Mayfield Irrigation Companies propose two small reservoirs on Twelve Mile Creek, one being located on the South Fork and the North Fork respectively, with a combined capacity of an estimated 76 acre-feet. There are about 1,600 people in the vicinity of Mayfield and Gunnison that would benefit from this project. Preliminary surveys have been made by the State Engineer's office on the reservoir located on the South Fork of Twelve Mile Creek. An investigation is required of the proposed project located on the South Fork. The total estimated construction cost is \$26,500.

The Beaver Dams Reservoir Project.- The Ephraim Irrigation Company proposes to enlarge two small reservoirs with a combined capacity of 22 acre-feet to a capacity of 56 acre-feet, located on the head waters of Seely Creek in the San Rafael River Drainage. This project would benefit the Ephraim water users by providing additional storage for the Emery County water users so that present diversion time could be extended through the existing tunnel. Approximately 200 families would benefit from this project. The estimated construction cost is \$4,000.

The Beaver Dam - Gooseberry Reservoir Project.- The water users of Fairview propose to increase the existing Beaver Pond located on Gooseberry Creek to a capacity of 1,156 acre-feet. This project would provide additional water to be carried through the proposed Gooseberry Diversion Project which is outlined in the diversion and conveyance section of this county report. Inadequately irrigated lands in Fairview, Moroni, and the west fields of Mt. Pleasant would benefit from this project. Preliminary surveys and estimates have been completed by the State Engineer's office, with an estimated construction cost of \$114,000.

Freeman Alred Reservoir Project.- The Horseshoe Irrigation Company and the Spring City Water Users propose a reservoir of 291 acre-foot capacity at a site on Oak Creek, water to be supplied by transmountain diversions brought through the Spring City Tunnel.

This reservoir is urgently needed to conserve high water that is presently running to waste during the early part of the irrigation season. There are 1,500 acres of inadequately irrigated land which would be provided a supplemental supply, and approximately 100 families would benefit from this project. Preliminary engineering has been completed by the State Engineer's office and the U. S. Bureau of Reclamation with an estimated construction cost of \$92,000.

Twin Creek Reservoir Project.- Twin Creek Water Users propose a reservoir of 480 acre-foot capacity at an offstream site, using the waters of Twin and Cedar Creeks to provide the required capacity. The project would require approximately two miles of feeder canal. Approximately 400 acres of inadequately

irrigated land in the vicinity of Mt. Pleasant and Spring City would receive supplemental water. An estimated 50 families would benefit from this project. Preliminary surveys are being made by the Agricultural Adjustment Administration with an estimated construction cost of \$24,000.

Jet Fox Reservoir Project.- The Water Users of Manti propose to repair and enlarge the existing reservoir to a capacity of 1,146 acre-feet. The existing reservoir has leaked quite extensively and a thorough investigation is required to determine the feasibility of this project. Approximately 2,000 people would benefit from this development. The State Engineer's office has surveyed this site with an estimated construction cost of \$45,000. This estimate was based on a tunnel to Manti Creek, with suitable control structures, but did not include the cost of feeder canals.

Other Possible Diversion From The San Rafael and Price River Drainage Areas

Reference is made to a reconnaissance report of existing possible diversions to Sanpete Valley made by the Bureau of Reclamation - 1940. This report summarized a field reconnaissance made regarding possible diversions. However, the feasibility of each was first dependent upon available water supply, which can only be determined by obtaining adequate stream flow records in the respective drainage areas. These are not outlined in this report due to the lack for essential information. However, as investigations continue and the water rights and availability of water is clearly shown, these proposed diversions should receive detailed investigations.

Bureau of Reclamation Project

Gooseberry Project.-(1)

- - - (1) Bureau of Reclamation's Gooseberry Project, November 1946.

Construction of the Gooseberry project would make available 10,200 acre-feet of middle and late season water for partial and supplemental irrigation of 21,800 acres of land now inadequately irrigated near Mt. Pleasant and Fairview, Utah. The project plan provides for the diversion of head waters of the Price and San Rafael Rivers in the Colorado River Basin to the San Pitch River in the Bonneville Basin. This plan involves the construction of the Mammoth Dam on Gooseberry Creek to provide a reservoir of 17,200 acre-feet, three feeder canals totaling 9.6 miles, a transmountain diversion tunnel 2.4 miles long, and a distribution canal 10.5 miles long. These works fit into any general plan for utilization of the water resources of this region.

Summary

Table 35 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 35

PROPOSED RESERVOIR PROJECTS IN SANPETE COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost		Area to be Benefited*
			Total	Acre-Foot	
Blue Meadow	Six Mile Creek	100	10,000	100	300 s
Blue Lakes	South Fork, Twelve Mile Creek	46	17,500	379	
	North Fork, Twelve Mile Creek	30	9,000	300	200 s
Beaver Dam**	Seely Creek	56	4,000	116	200 s
Beaver Dam (Gooseberry Creek)	Gooseberry Creek	1,156	114,350	99	3,000 s
Freeman Alred***	Cottonwood Creek	291	92,000	317	1,500 s
Twin Creek***	Twin-Cedar Creeks	480	24,000	50	1,000 s
Jet Fox**	Coal Fork Creek	1,146	45,000	39	5,000 s
	TOTAL	<u>3,305</u>	<u>315,850</u>		<u>11,200 s</u>
<u>U. S. Bureau of Reclamation Project</u>					
Gooseberry	Gooseberry Creek	10,200	---	---	21,800 s

- * s - Supplemental supply to inadequately irrigated lands.
 ** - Enlarge and repair.
 *** - Offstream site.

Diversion and Conveyance Needs

There are 49 irrigation companies in Sanpete County serving approximately 88,000 acres of irrigated land. The distribution systems serving this area consist of approximately 233 miles of main canals with an average intake capacity of 41 c.f.s., and 230 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 10 c.f.s.

Results of the survey show that 22 irrigation companies have proposed needed diversion and conveyance projects. The major needs relative to improvement and repair of the existing distribution systems in Sanpete County are:

(1) Canal lining, to prevent excessive seepage losses of available irrigation water, and reduce the danger of water logging or seeping the land below leaky canal sections.

(2) Proper realignment, cleaning, and enlargements are needed in the majority of main canals, and laterals to increase the efficiency and conservation of their available irrigation water.

The first two projects approved in Sanpete County were the new constructions of two diversion dams diverting water from the Sevier River, sponsored by the Gunnison-Fayette, and Westview Irrigation Companies. The Utah Water and Power Board approved \$11,000 for assistance in completing the construction. These projects are being constructed by the Army Engineers in connection with the Redmand Flood Control Project on the Sevier River.

The second major project approved for investigation was the Gooseberry Feeder Canal and Tunnel. This project consists of diverting water from Upper Gooseberry Creek, and construction of a feeder canal about three miles long, and then brought transmountain by a 2,300 foot tunnel emptying into Cottonwood Creek to provide supplemental water to inadequately irrigated land in the vicinity of Fairview, with an estimated construction cost of \$97,000.

Summary

Table 36 summarizes the proposed projects, showing the name of the irrigation company, its source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 36

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres*
Brady Ditch	San Pitch River	4.0 miles-canal enlargement 132 ft.-flumes	\$2,500	Prel. Est.	365
Chester	Oak Creek Canal Creek	3.0 miles-canal lining	24,000	"	1,000
Cottonwood- Gooseberry Birch-Spring Creek, Oak Creek San Pitch	Gooseberry Creek	(Gooseberry Project*)	98,000	Complete	3,000
Fayette	Worm Creek	1,650 ft.-pipe installation	4,400	Prel. Est.	500
Freedam Irri- gation and Water Works	Current Maple Canyon	260 ft. - pipe installation	1,000	"	150
Gunnison - Fayette	Sevier River	1 - diversion dam	5,500**	Complete	7,000
Indianola	Thistle Creek Clear Creek Rock Creek	1 mile- canal construction 0.5 mile - realign- ment 4 - diversion dams 2-control structures	9,100	Prel. Est.	2,180
Highland Canal	Twelve Mile Creek	3 miles - canal enlargement 8 miles - canal lining 2 miles - canal construction 12 - control structures	75,000	"	3,500
Birch Creek	Birch Creek	2 - diversion dams 10 - control structures	2,500	"	3,200

TABLE 36. PROPOSED DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres*
Mt. Pleasant Moroni	San Pitch River	5.0 miles-canal lining 10.0 miles-canal repairs and alterations 10 control structures	86,500	Prel. Est.	3,200
Manti Irrigation and Reservoir	Funks Lake	0.64 miles-canal lining 0.64 miles realignment	8,000	"	1,200
New Field	San Pitch River Six & Twelve Mile Creeks	1.5 miles-canal enlargement	2,250	"	2,200
Rock Dam	San Pitch River	0.25 miles-canal lining 1 - diversion dam 2 miles canal enlargement	3,500	"	1,500
Sheep Ditch	San Pitch River	3.0 miles canal enlargement	1,000	"	350
Sterling	Six Mile Creek	1.0 miles-canal enlargement and repair 4 - control structures	1,250	"	920
Silver Creek	Silver Creek	70 control structures	2,100	"	600
Westview	Sevier River	1 - diversion dam	5,500***	"	2,000
Willow Creek	Willow Creek Michaelsen Spring Willow Creek Reservoir	1 mile canal enlargement 0.1 mile new canal 85 ft.-flume replacement 1 - control structure	3,000	"	1,300
TOTAL			<u>\$334,100</u>		<u>30,965</u>

- * Transmountain Diversion.
- ** Amount approved by the Utah Water and Power Board.
- *** Amount approved by the Utah Water and Power Board.

Summary

Sanpete County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects.)

(1) Reservoir Projects - - - - -	\$316,000
(2) Diversion and Conveyance Projects - -	\$334,000.
	<hr style="width: 100%;"/>
TOTAL- - -	<u><u>\$650,000</u></u>

JUAB COUNTY

PROJECT MAP

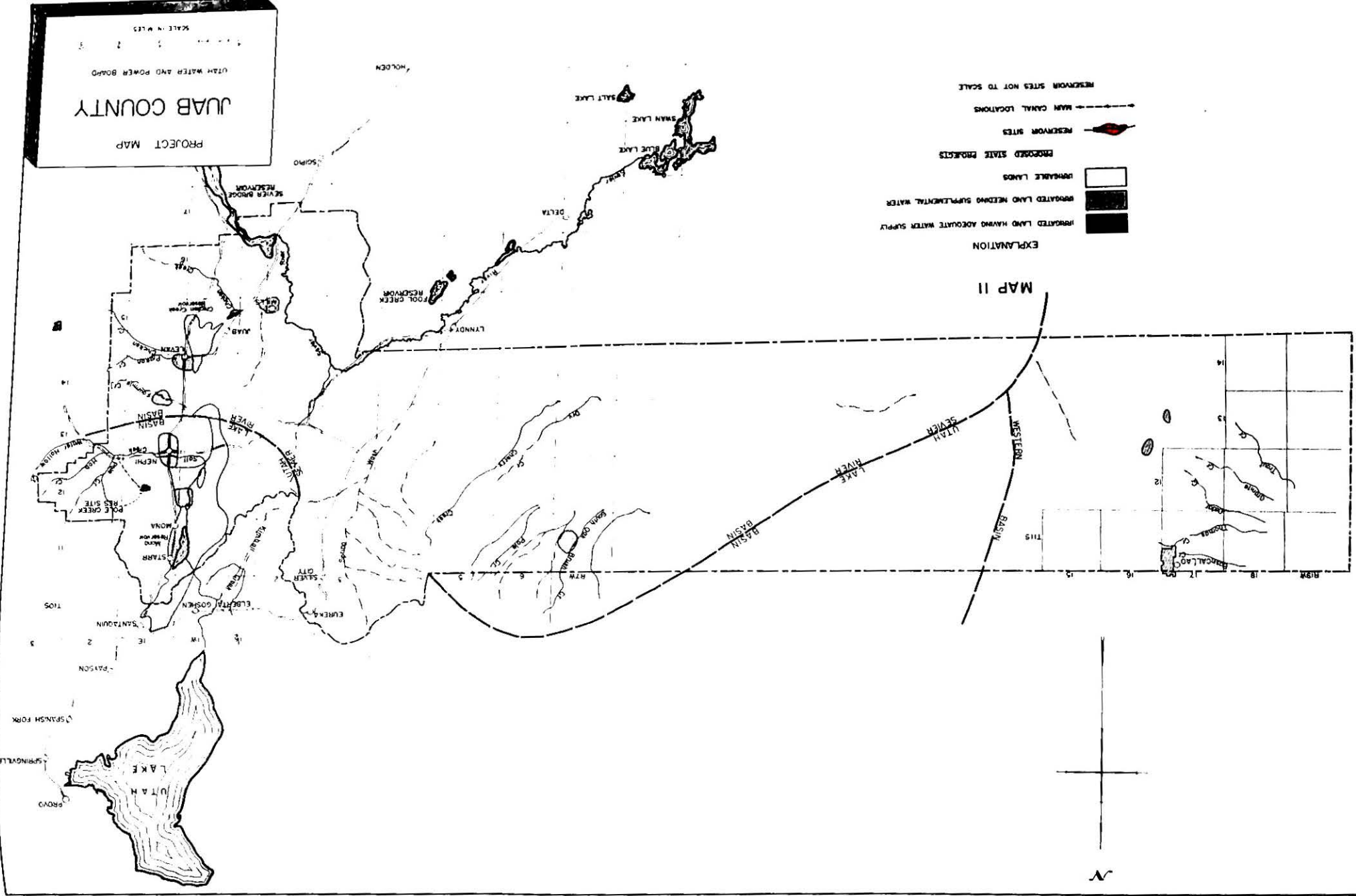
UTAH WATER AND POWER BOARD

SCALE IN MILES

0 1 2 3 4 5

- EXPLANATION
- IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
 - IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
 - UNDEVELOPED LANDS
 - PROPOSED STATE PROJECTS
 - RESERVOIR SITES
 - MAIN CANAL LOCATIONS
 - RESERVOIR SITES NOT TO SCALE

MAP 11



J U A B C O U N T Y

Introduction

Juab County lies within the Utah Lake, Sevier River, and West Desert Drainage areas. Present development of the water resources are outlined under each area.

Utah Lake Drainage Area

This area includes the northeast portion of Juab County, with the principal tributaries Salt, Willow, and North Creeks draining the west slopes of the Nebo Mountains, and then draining generally northeast into the Mona reservoir. The irrigated area amounts to about 9,000 acres located in the general vicinity of Nephi and Mona, which requires a supplemental supply estimated at 10,700 acre-feet.

Sevier River Drainage Area

This area includes the southeast portion of the county, extending west to the Thomas Range. The principal tributaries are Chicken and Pigeon Creeks serving approximately 3,600 acres in the vicinity of Levan and Mills, with a supplemental water requirement estimated at 3,600 acre-feet.

Present storage development in this area, serving Juab County lands consist of the Chicken Creek Reservoir, with a capacity of 1,500 acre-feet, serving 2,900 acres of land near Mills.

East Slope of Deep Creek Mountain Drainage

This area includes the western part of Juab County, bounded on the east by the Thomas Mountains, extending west into Nevada. The principal tributaries are Tom's, Indian, Farm, Basin, Trout, Granite, Red Cedar, and Birch Creeks, serving approximately 1,800 acres in the extreme western part of Juab County. The supplemental water requirements are estimated at 1,800 acre-feet.

It is noted that practically all the irrigated lands in Juab County are in need of supplemental water, the supplemental demand ranging from one to one and a half acre-feet per acre. The total irrigated area in Juab County amounts to approximately 15,000 acres, requiring a total estimated supplemental supply of 16,100 acre-feet.

Potential Irrigable Land Development

The Bureau of Reclamation's proposed Central Utah Project would provide a full supply to a large area of new land extending from Utah County south to Nephi, and a supplemental supply to about 12,600 acres of inadequately irrigated land lying in the east portion of Juab County.

Proposed Reservoir Projects

Reservoir development in Juab County, in general, has been considered infeasible either from the engineering or the economic standpoint. Numerous

investigations by different government agencies have been made regarding potential reservoir developments; and up to the present time, no large or moderately large irrigation water storage possibilities have been presented. Therefore, it appears that the only source for supplemental water must come through trans-basin diversions. (Central Utah Project)

One small reservoir project is outlined for supplemental storage development.

Pole Canyon Reservoir Project.- The Nephi Irrigation Company proposes a reservoir of 50 acre-feet capacity at an offstream site north of Nephi, supplied by the waters of Salt Creek. This project would furnish supplemental water to an estimated 200 acres of inadequately irrigated land in the vicinity of Nephi.

There are about 300 people that would benefit from this project. The Soil Conservation Service has made preliminary surveys of the proposed site, with an estimated construction cost of \$5,000.

Summary

Table 37 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 37
PROPOSED RESERVOIR PROJECTS IN JUAB COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost\$ Total	Area to be Benefited Acre-foot	Acres
Pole Canyon	Right Fork Pole Canyon Creek	50	\$5,000	100	200 s
TOTAL		50	\$5,000	100	200 s

* s - Supplemental supply for inadequately irrigated lands.
n - Full supply for new arable lands.

Diversion and Conveyance Needs

There are 21 irrigation companies in Juab County, serving approximately 15,000 acres of irrigated land. The distribution systems serving this area consist of approximately 16 miles of main canals, with an average intake capacity of 26 c.f.s., and 53 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 9 c.f.s.

Results of the survey show that 17 irrigation companies have proposed diversion and conveyance projects.

As Juab County has but one or two water storage possibilities, the major undertaking will be to repair and improve their distribution systems, and to conserve in every way possible their existing supply of irrigation water. The major needs relative to improvement and repair of Juab County's distribution systems are:

(1) Canal Lining. To prevent excessive seepage losses of available irrigation water.

(2) Diversion Structures. To repair or construct new diversion structures diverting water from mountain streams on the west slope of the Uintah National Forest.

(3) Control Structures. Replacement or repair of control structures is generally needed throughout the distribution systems.

The first project approved for investigation and construction by the Utah Water and Power Board was the Callao Irrigation Project, consisting of constructing 10,700 feet of canals, and lining with bentonite another 10,900 feet of canal with a 25 c.f.s. capacity, which diverts water from Basin and Tom's Creeks.

This project will benefit an estimated 650 acres of inadequately irrigated land, and 1,000 acres of new land in the vicinity of Callao. There are about 55 people that would benefit from this project. The estimated construction cost is \$38,000.

The second project approved for investigation was an emergency measure to assist the Nephi Irrigation Company to repair and reconstruct their silt and gravel check dam, located in Salt Creek Canyon, approximately eight miles east of Nephi. This project was necessary to protect the presently irrigated land in the vicinity of Nephi, and also the city itself from flooding with silt and gravel. The cost of the project was estimated at \$5,000.

Note: The necessary construction was made by the irrigation company without financial assistance from the State of Utah.

Summary

Table 38 summarizes the proposed projects, showing the name of the irrigation company, its source of supply, type of project, estimated construction cost, and areas to be benefited.

TABLE 38

PROPOSED DIVERSION AND CONVEYANCE NEEDS

AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS.

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Callao	Tom's Creek Basin Creek	2.0 miles-canal lining. 2.0 canal construction	38,000	Complete	600

TABLE 38. PROPOSED DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Juab Lake	Chicken Creek Reservoir	12.0 miles-canal lining 15 - control structures	120,750	Prel. Est.	700
Levan	Chicken Creek	12.0 miles-canal lining 0.5 miles-realign- ment 24 - control structures	124,000	"	2,500
Mona	Willow Creek Clover Creek Bear Creek Couch Creek	6.0 miles-canal lining 37 - control structures	24,350	"	900
Nephi	Salt Creek	38.0 miles-canal lining	214,000	"	7,500
North Creek	North Creek	2.0 miles-canal lining 1 - control structure	20,500	"	600
Trout Creek Ranches	Trout Creek Birch Creek	6.0 miles-canal lining 2-diversion dams 2-control structures	61,550	"	600
Granite Creek	Granite Creek Trout Creek	4.0 miles-canal lining 15-control structures	20,750	"	240
Gardner Canyon	Gardner Creek	1.5 miles-canal lining 6-control structures	7,300	"	125
Four Mile Creek	Four Mile Creek	1.5 miles-canal lining 4-control structures	7,250	"	150

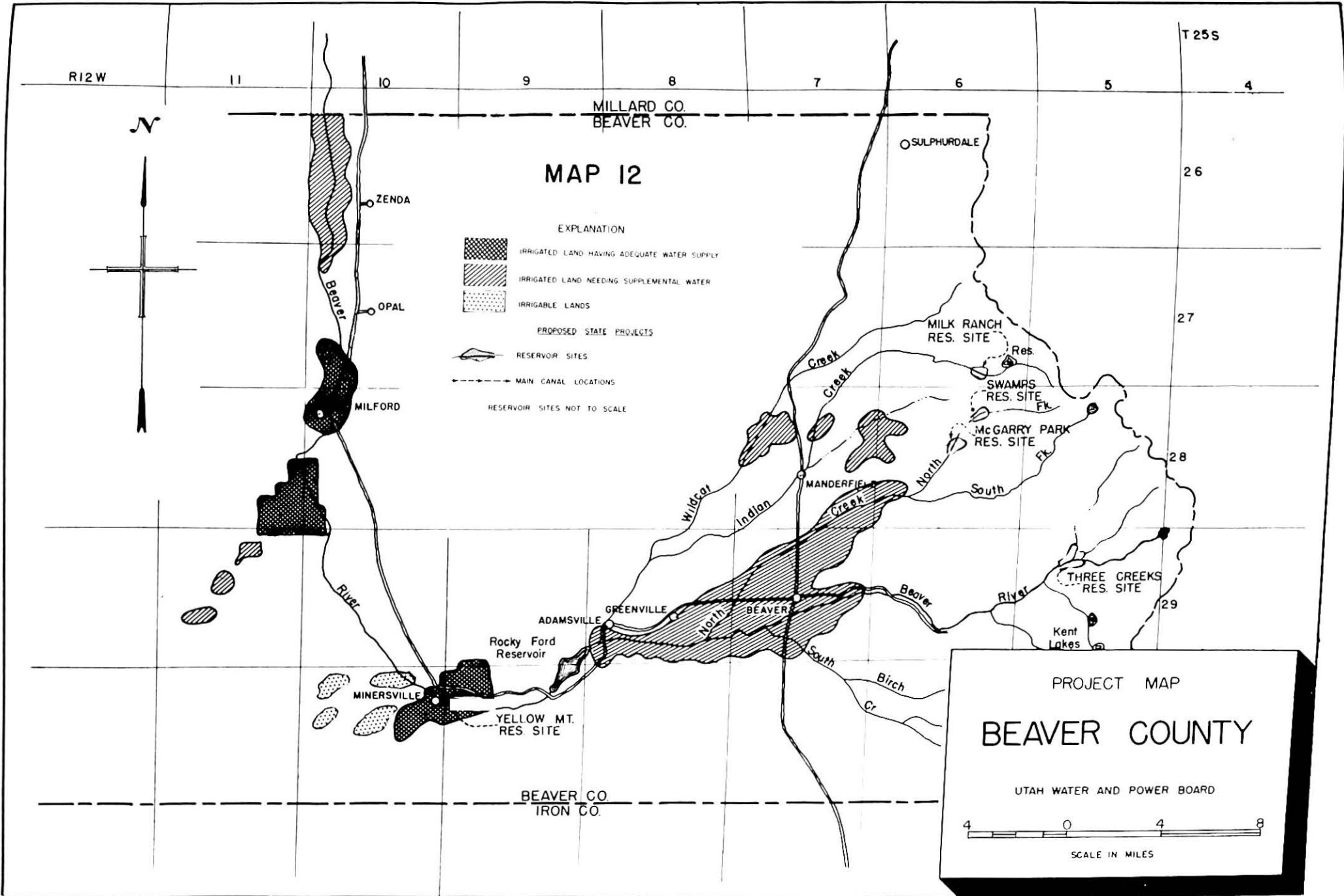
TABLE 38. PROPOSED DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Deep Creek Farms	Deep Creek	3.0 miles-canal lining 4-control structures	15,650	Prel. Est.	290
York Farms	Wash Canyon	2.0 miles-canal lining 6-control structures	10,400	"	80
Starr Farms	North Creek Mindehall Creek	3.0 miles-canal lining 2-diversion dams 1-control structure	16,250	"	300
Nortonville	Birch Creek Wide Creek Willow Creek	2.0 miles-canal lining	10,000	"	140
Chris's Creek	Chris's Creek	4.0 miles-canal lining 8-control structures	20,750	"	280
Little Salt Creek	Little Salt Creek	4.0 miles-canal lining 7-control structures	20,600	"	275
Ingram's Irrigation	Willow Creek	1.0 miles-canal lining 3-control structures	5,600	"	200
TOTAL			<u>\$737,700</u>		<u>15,490 Acres</u>

Summary

Juab County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation projects.)

(1) Reservoir Projects - - - - -	\$ 5,000
(2) Diversion and Conveyance Projects - - - - -	<u>\$737,700</u>
TOTAL- - - - -	<u>\$742,700</u>



B E A V E R C O U N T Y

Introduction

Beaver County lies within the South Sevier Lake Drainage Area. The principal stream is the Beaver River, with North, South, Birch, and Indian Creeks being its major tributaries. Their head waters drain the west slopes of the Tusher Mountains, east of Beaver, forming into one stream at the Rocky Ford Reservoir. The river then flows northwest to Milford and dissipates northward in the Sevier Sinks. These streams serve approximately 14,000 acres of irrigated land in the vicinities of Beaver, Manderfield, and Minersville.

The estimated supplemental water requirements for the inadequately irrigated land amount to approximately 10,000 acre-feet. Late season water shortages are most acute in the Beaver area where storage is necessary to supplement their present water supply.

Present Storage Development

Serving Beaver County lands are five reservoirs with a combined capacity of approximately 23,850 acre-feet, the Rocky Ford Reservoir being the principal source of storage with a limited capacity of 22,000 acre-feet.

Potential Irrigable Land Development

There are about 2,000 acres of irrigable land that could be supplied with a full supply by the proposed Yellow Mountain Reservoir Project, located in the vicinity of Minersville.

Proposed Reservoir Projects

Five potential projects are outlined for the development of the water resources in Beaver County. The first project considered for investigation and construction was the Three Creeks Reservoir Project. Construction at this site began during the summer of 1948.

The proposed reservoir projects would provide 3,400 acre-feet to be used as a supplemental supply to inadequately irrigated lands, and 6,000 acre-feet to be used as a full supply for new lands. This supply, when made available, will provide a supplemental water supply to 6,000 acres of cultivated land, and a full supply to 2,000 acres of new land.

Three Creeks Reservoir Project.- Kent Lakes Reservoir Company proposes a reservoir of 2,023 acre-feet at a site on Beaver River located approximately 16 miles upstream from Beaver City at the confluence of Three Creeks. The project will provide a supplemental water supply to 3,500 acres of inadequately irrigated land in the vicinity of Beaver, and would benefit approximately 2,000 people.

Investigations have been completed, and the project is approved for construction with an estimated construction cost of \$162,000. The Utah Water and Power Board has allocated \$122,150, with the Water Users providing the additional cost.

McGarry Park Reservoir Project.- West Side and North Creek Irrigation Companies propose a reservoir of 400 acre-feet capacity at a site on the North Fork of North Creek, located approximately three miles northeast of North Creek. This project will provide a supplemental supply to approximately 600 acres of inadequately irrigated lands in the vicinity of North Creek and Beaver, and would benefit about 50 families. Investigations are required to determine feasibility of this dam site and the estimated construction cost.

Swamps Reservoir Project.- West Side and North Creek Irrigation Companies propose another reservoir of 620 acre-feet capacity at a site on North Creek located approximately five miles northeast of North Creek. The project will provide a supplemental supply to 1,200 acres of inadequately irrigated lands in the vicinity of North Creek, and would benefit approximately 50 families. Preliminary surveys and cost estimates have been made by the State Engineer's office, with an estimated construction cost of \$161,000.

Milk Ranch Reservoir Project.- Manderfield Irrigation and Reservoir Company proposes a reservoir of 366 acre-feet capacity at a site on Indian Creek, a tributary to Beaver River, located approximately 14 miles northeast of Beaver. This project would provide a supplemental supply to 700 acres of inadequately irrigated land in the vicinity of Manderfield, and would benefit approximately 16 families. Preliminary surveys and cost estimates were made by the State Engineer's office, with an estimated construction cost of \$88,139.

Yellow Mountain Reservoir Project.- Minersville Water Users propose a reservoir of 6,000 acre-feet capacity at a site on Beaver River, located approximately four miles below existing Rocky Ford Reservoir. The plan calls for the enlarging of present canals and extending laterals. This project will provide a full supply to approximately 2,000 acres of new land southwest of Minersville, with approximately 40 families benefiting from the increased water supply. The Utah Water and Power Board has approved this site for investigation. No cost estimates have been made.

Summary

Table 39 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 39

PROPOSED RESERVOIR PROJECTS IN BEAVER COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost Total	Estimated Cost Acre-foot	Area to be Benefited Acres*
Three Creeks Reservoir	Beaver River	2,023	\$122,000**	75	3,500 s
McGarry Park	North Fork North Creek	400	Investigation Required		600 s
Swamps	North Fork North Creek	620	161,000	260	1,200 s
Milk Ranch	Indian Creek	366	88,000	240	700 s
Yellow Mountain	Beaver Creek	6,000	Investigation Required		2,000 n
	TOTAL	9,405	\$371,000***		6,000 s 2,000 n

* Area to be benefited: s - Supplemental supply to inadequately irrigated lands. n - Full supply to new lands.

** Project approved for construction. State has allocated \$122,150. Sponsors will provide additional cost.

*** Cost estimate for Yellow Mountain and McGarry Park Reservoir. Projects are not included.

Diversion and Conveyance Needs

There are 16 irrigation companies in Beaver County serving approximately 16,000 acres of irrigated land. The distribution systems serving this area consist of approximately 46 miles of main canals with an average intake capacity of 31 c.f.s., and 51 miles of laterals over 4 c.f.s., with an average intake capacity of 14 c.f.s.

Results of the survey show that five irrigation companies have proposed needed distribution projects. The proposed projects consist mainly of canal lining to prevent excessive seepage losses where canals pass through porous gravel beds, and canal repairs and alterations to increase the capacity and efficiency of the distribution systems.

Summary

Table 40 summarizes the proposed diversion and conveyance projects showing the name of the irrigation company, its source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 40

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

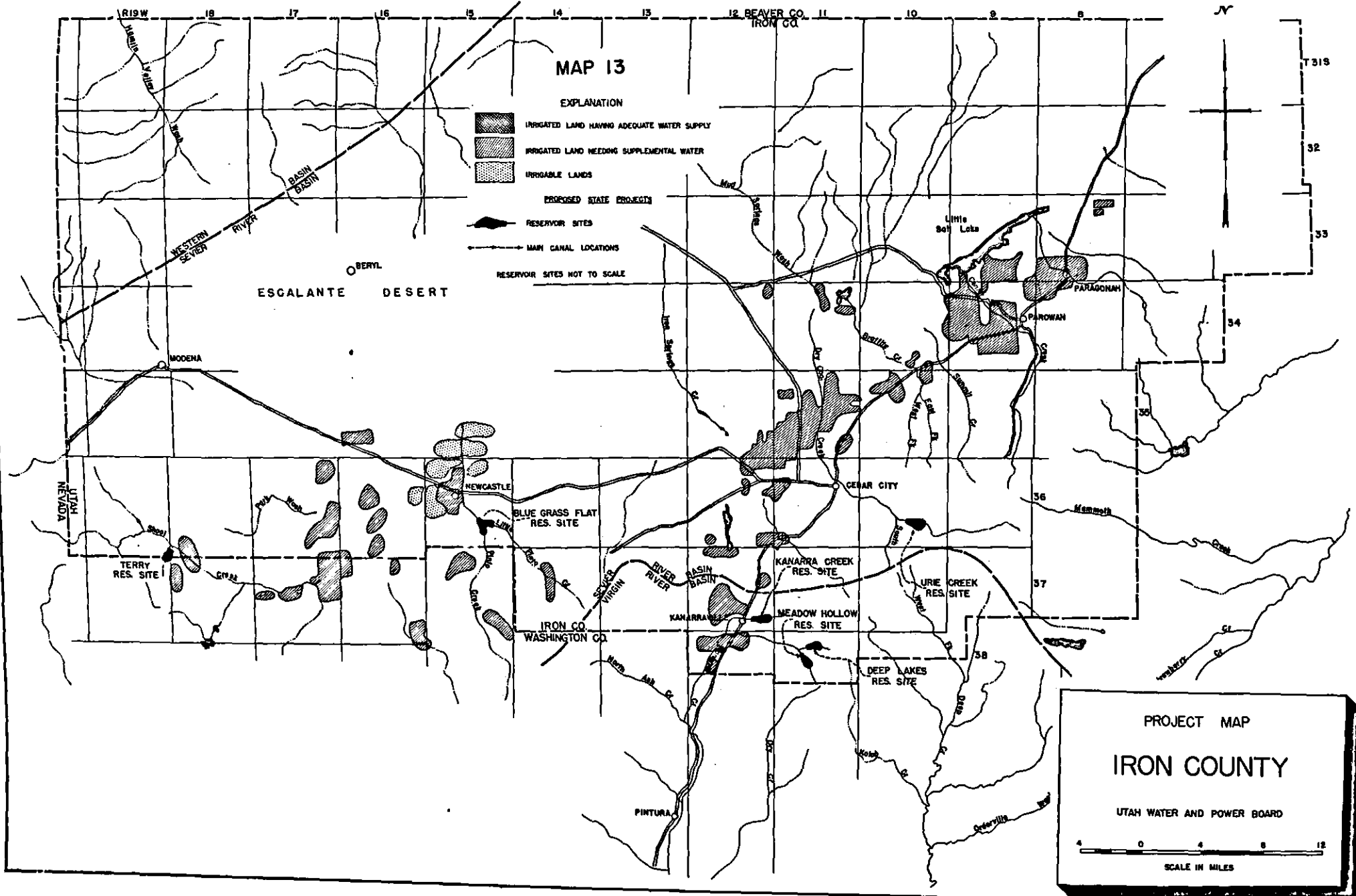
Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Minersville Reservoir and Canal Company	Beaver Creek Rocky Ford Reservoir	2 miles-canal lining 1 - control structure	\$40,000	Prel. Est.	2,500
North Creek Irrigation Company	North Creek Blue Lake Reservoir	3 miles-canal repair and alteration 3 - control structures	6,500	"	3,000
South Bench Reservoir	Beaver River Kent Lakes Reservoir	0.5 miles-canal lining 2 - control structures	5,290	"	560
West Side Irrigation Company	North Creek	3.5 miles-canal lining sand - gravel control	55,000	"	1,300
South Creek Mutual Irrigation Company	South Creek Birch Creek	3.0 miles-pipe installation	24,000	"	800
TOTAL			<u>\$130,700</u>		<u>8,160 acres</u>

Beaver County Summary

The total estimated requirements for the proposed development and conservation of the water resources of Beaver County are summarized:

(1) Reservoir Projects - - - - -	\$371,000
(2) Diversion and Conveyance Projects - -	\$130,700
TOTAL - - -	<u>\$501,700</u>

(126)



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12 BEAVER CO.

IRON CO.

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8

UTAH
NEVADA

TERRY
RES. SITE

MODENA

ESCALANTE DESERT

OBERYL

WESTERN
SEVEN
RIVER

RASIN
BASIN

NEWCASTLE

BLUE GRASS FLAT
RES. SITE

IRON CO.
WASHINGTON CO.

PINTURA

SEWER
RIVER

RIVER

RASIN
BASIN

KANARRA

KANARRA CREEK
RES. SITE

MEADOW HOLLOW
RES. SITE

URIE CREEK
RES. SITE

DEEP LAKES
RES. SITE

CEAR CITY

LITTLE
SALT LAKE

PAROWAN

PARAGONAH

MEMPHIS

WYBARGER

WYBARGER

IRON COUNTY

Introduction

The major part of Iron County lies within the South Sevier Lake Drainage with the exception of a small area south of Kanarraville, which drains south into the Virgin River.

The greater part of Iron County drains generally north, with the head waters originating in the north slopes of the Dixie National Forest in Washington County, and the west slopes of the Parawan Range forming the east boundary of Iron County. The irrigated land in this area amounts to approximately 24,000 acres requiring an estimated supplemental supply of 22,000 acre-feet. In the Escalante Desert Area, there are approximately 12,000 acres irrigated, an estimated 10,000 acres supplied by underground water, and 2,000 acres by surface water.

The major streams supplying surface irrigation water are Kanarra, Coal, Little, Red, Summit, Parawan, and Pinto Creeks. One small diversion is made from the head waters of the Santa Clara River in the Virgin River Drainage to Pinto Creek supplying the New Castle area. The major source of irrigation water development in the Escalante Desert Area has been derived from underground water supplied through numerous pump wells.

Present storage development in this area consists of five reservoirs with a combined capacity of 6,200 acre-feet, serving an estimated 4,200 acres in the vicinity of Parowan and Paragonah. Reservoir development throughout the remainder of the county has been very small.

Proposed Reservoir Projects

Six reservoir projects are outlined for development of water resources within Iron County. The proposed reservoirs would supply 11,389 acre-feet of storage for supplemental and new water requirements.

South Sevier Lake Drainage Area

Blue Grass Flat Reservoir Project.- Grass Valley and Desert Irrigation Company Water Users propose a reservoir of 6,500 acre-feet capacity at a site on Pinto Creek, additional water to be supplied from the Virgin River Drainage. This project would provide a supplemental supply to 1,400 acres of inadequately irrigated land, and a full supply to an estimated 1,500 acres of new land in the vicinity of New Castle.

There are about 40 families that would benefit from this project. Preliminary surveys and estimates have been made by the State Engineer's office, with an estimated construction cost of \$518,000.

Urie Creek Reservoir Project.-(1) Urie and Coal Creek Water Users propose two reservoirs with a combined capacity of 2,769 acre-feet at a site on Urie Creek. Additional transmountain diversions of water from the Virgin River Watershed would be required to supply adequate storage at this site, which would require a feeder canal 8.5 miles long.

This project would provide a supplemental supply to an estimated 3,000 acres in Cedar Valley, and would benefit about seven families. The Soil Conservation Service has made preliminary surveys and estimates, with an estimated construction cost of \$121,000

(1) Also reported by the Utah Relief Administration's Report on "Proposed Reservoirs." p. 60.

Terry Reservoir Project.- Terry Brothers request an investigation to determine the feasibility of constructing a reservoir of approximately 200 acre-feet capacity to be supplied by natural springs, located approximately 12 miles west of Enterprise. An estimated 100 acres of new land could be brought under cultivation with four families benefiting from a storage reservoir in this vicinity. The Soil Conservation Service has made preliminary surveys of this project.

Kanarra Creek Reservoir Project.- Kanarraville Water Users propose two small reservoirs located in Cedar Mountain with a combined capacity of 40 acre-feet. This project would provide supplemental water to an estimated 100 acres in the vicinity of Kanarraville, and would benefit approximately 300 people. Preliminary surveys and estimates are required. No estimates of cost are available.

Virgin River Drainage Area

Meadow Hollow Reservoir Project.- Spring Creek - LaVerkin Creek Irrigation Company proposes a reservoir of 209 acre-feet capacity, located on the head waters of Spring Creek. This project would provide supplemental water to an estimated 600 acres of land southeast of Kanarraville.

There are about six families that would benefit from this project. Engineering surveys and estimates have been completed by the Soil Conservation Service, and construction was 90 per cent complete as of July, 1948. The estimated construction cost is \$19,000. This project has received approval by the Utah Water and Power Board, and was allocated \$14,000 towards completion of the project.

Deep Lake Reservoir Project.- Spring Creek - LaVerkin Creek Irrigation Company proposes to reservoir Deep Lake with a capacity of 150 acre-feet, located about 0.5 miles north west of the Meadow Hollow Reservoir. The project plan calls for installation of outlet works and construction of a feeder canal 2,100 feet long, from Deep Lake to Meadow Hollow Reservoir. This project would provide additional supplemental water to the 600 acres of irrigated land served by this irrigation company, and would benefit six families. Engineering surveys and estimates have been completed by the Soil Conservation Service, with an estimated construction cost of \$8,000.

Summary

Table 41 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 41

PROPOSED RESERVOIR PROJECTS IN IRON COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost\$ Total	Estimated Constr. Cost\$ Acre-foot	Area to be Benefited Acres*
Blue Grass Flat	Pinto Creek Virgin River Drainage	6,500	\$518,000	79	1,400 s 1,500 n
Urie Creek	Barnhurst Hollow Coal Creek	2,769	121,000	22	1,000 s
Terry	Springs	200	Investigation Required		100 n
Kanarra Creek	Kanarra Creek	40	Investigation Required		100 s
Meadow Hollow	Spring Creek - LaVerkin Creek	209	14,000**	91	600 s
Deep Lake	Spring Creek - LaVerkin Creek	150	8,000	53	600 s
TOTAL***		<u>9,628</u>	<u>\$661,000</u>		1,500 n <u>3,600 s</u>

* - s - Supplemental supply to inadequately irrigated lands.
 - n - Full supply to new lands.

** Utah Water and Power Board approved \$14,000 for this reservoir project.

*** Totals do not include proposed Terry and Kanarra Creek Reservoir Projects.

Diversion and Conveyance Needs

There are 20 irrigation companies in Iron County serving approximately 24,000 acres of irrigated land. The distribution systems serving this area consist of approximately 25 miles of main canals, with an average intake capacity of 42 c.f.s., and 88 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 11 c.f.s.

Results of the survey show that eight irrigation companies have proposed distribution projects. The major needs relative to improvement and repair of the existing distribution systems are:

(1) Canal lining, to prevent excessive seepage losses of available irrigation water.

(2) Replacement or repair of the main diversion structures on the mountain streams, and the replacement of a number of control structures.

There are no reports available concerning the amount of seepage losses in canals within Iron County. However, the water users are aware that excessive seepage losses exist in certain sections of their distribution systems, and they also realize the need for conducting extensive surveys to determine the amount and extent of seepage losses.

Summary

Table 42 summarizes the proposed diversion and conveyance projects, showing the name of the irrigation company, its source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 42
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Grass Valley	Grass Valley & Pinto Creeks	1-diversion dam repair	\$1,000	Prel. Est.	1,500
Little Creek Field and Canal	Little Creek	1 mile-canal lining 1-sand and gravel control structure	10,000	"	400
North Field	Coal Creek	5 miles-canal realignment and lining	16,000	"	1,260
Paragonah	Red Creek	3-diversion dams 5 - control structures	3,000	"	1,600
South and West Field	Coal Creek	3 miles-canal lining 1-diversion dam 12 - control structures	25,300	"	900
Summit	Summit Creek	1 mile-pipe line	10,000	"	500

TABLE 42. DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Spring Creek- LaVerkin	Spring Creek Willow Creek LaVerkin Creek	2 miles-canal lining	\$8,000	Prel. Est.	600
Union Field	Coal Creek	5 miles-canal lining 10 - control structures 1 - diversion repair	52,000	"	1,200
			<u>\$125,300</u>		<u>7,960</u>

Iron County Summary

Iron County's total estimated cost for the proposed distribution and storage developments.

(1) Reservoir Projects - - - - -	\$661,000
(2) Diversion and Conveyance Projects - -	<u>\$125,300</u>
TOTAL- - - -	<u>\$786,300</u>

WASHINGTON COUNTY

Introduction

Washington County lies within two drainage areas, the major part of Washington County is included within the Virgin River Drainage, and a small section in the northwest part of the county lies in the South Sevier Lake Drainage.

Virgin River Drainage Area

The major stream is the Virgin River, and the major tributaries are the Santa Clara River, Kolob and Ash Creeks, plus several more minor streams that carry high water in the spring and are practically dry the major part of the irrigation season.

Approximately 14,500 acres are irrigated, of which 1,900 acres are estimated to have a full supply. The supplemental water requirements for this area, are estimated at 14,000 acre-feet.

South Sevier Lake Drainage Area

The main source of supply is Shoal Creek and a few unnamed springs which serve approximately 1,920 acres in the vicinity of Enterprise. The supplemental water requirements are estimated at 1,740 acre-feet.

A study of the surface water supply, shows that the principal streams are fed chiefly from springs and melting snow, and except for numerous springs, a proportionately large area contributes very little to the stream runoff. Except where springs steady the rate of flow, the runoff fluctuates widely from season to season.

Therefore, development of the maximum amount of storage is essential to stabilizing the existing irrigated areas and providing any new irrigable area with water.

Present Storage Development

Serving Washington County lands are two reservoirs with a total capacity of 2,900 acre-feet serving approximately 2,200 acres of irrigated land.

Proposed Reservoir Projects

Seven reservoir projects are outlined for development of the water resources in Washington County. Five are outlined as proposed by the local water users, and two that have been reported by the Bureau of Reclamation, for the ultimate development of water and power within

this area.

The five reservoirs, as proposed by the local water users, would supply 13,213 acre-feet of storage to be used as a supplemental supply for an estimated 13,100 acres of inadequately irrigated land. The two reservoir projects, as outlined by the Bureau of Reclamation, would supply 79,000 acre-feet of active storage to be applied to an estimated 8,000 acres of inadequately irrigated land, and to 16,500 acres of new irrigable land.

Ash Creek Reservoir Project.- Pintura, Toquerville, LaVerkin, Hurricane, St. George, and Washington Canal Companies propose a reservoir of 6,600 acre-feet capacity located at a site on Ash Creek. The proposed dam would serve a dual purpose, as it could be used as a high-way bridge over Ash Creek for the proposed new relocation of U. S. 91; and also would provide supplemental water to 5,000 acres of inadequately irrigated land extending from the proposed site south to St. George. This project would also make available spring water for culinary purposes, which has heretofore been used for irrigation.

Final surveys and designs have been made by the Utah Water and Power Board with the assistance of the State and Public Road Agencies. The estimated cost of the project is \$599,811. The estimated cost to the water users, will amount to approximately \$200,000.

Big Creek Reservoir Project.- The Virgin and LaVerkin Bench Irrigation Companies propose a reservoir of 2,241 acre-feet capacity at a site on Kolob Creek, a tributary to the North Fork of the Virgin River. This project would provide supplemental water to an estimated 1,800 acres of inadequately irrigated lands in the vicinity of Hurricane and LaVerkin bench.

Approximately 2,500 people would benefit from this project. Preliminary surveys and cost estimates have been made by the State Engineer's office, with an estimated construction cost of \$120,000.

Central Reservoir Project.- The Central Canal and Irrigation Company proposes a reservoir of 250 acre-feet capacity at an offstream site supplied by waters from Santa Clara River. A feeder canal, approximately three miles long, would be required.

The project would provide supplemental water to an estimated 300 acres in the vicinity of Central. There are about 20 families that would benefit from this project. An investigation is required to determine estimates and costs.

Clay Basin Reservoir Enlargement Project.- St. George and Santa Clara Bench Canal propose to enlarge the existing reservoir from the present capacity of 413, to 936 acre-feet. This project would provide supplemental water to 500 acres of inadequately irrigated land in the vicinity of Ivins Bench.

There are approximately 40 families that would benefit from this project. Preliminary estimates and surveys have been made by the Soil Conservation Service, with an estimated construction cost of \$32,000.

Red Cliff Reservoir Project.- St. George-Santa Clara Field, St. George and Santa Clara Bench, and Santa Clara Field Canal Companies propose a reservoir of 1,600 acre-feet capacity at an offstream site supplied by the waters from Santa Clara River.

The existing Ivins Bench feeder canal would be used as a feeder canal, diverting water from the Santa Clara River to the reservoir. This project would provide supplemental water to an estimated 1,300 acres of inadequately irrigated land in the vicinity of Santa Clara, Ivins Bench and St. George. Approximately 5,000 people would benefit from this project. Preliminary field surveys have been made by the Bureau of Reclamation. The estimated construction cost is \$175,000.

Enterprise Reservoir Enlargement Project.- Enterprise Reservoir and Canal Company proposes to enlarge the existing reservoir from 710 to 1,586 acre-feet capacity, supplied by waters of Little Pine Creek. The project plan calls for raising the dam height approximately 12 feet

An estimated 4,200 acres would receive supplemental water, and approximately 600 people would benefit from this development. Preliminary field surveys have been made with an estimated construction cost of \$60,000.

U. S. Bureau of Reclamation Projects (1)

Santa Clara Project.- Lower Gunlock Reservoir; full regulation and utilization of the flow of Santa Clara River, the principal Virgin River tributary, could be obtained by means of a 23,000 acre-feet (14,000 acre-feet active capacity) reservoir on the Lower Gunlock Site on that stream.

This project would provide a supplemental supply to 1,565 acres, and a full supply for 2,565 acres of new land. The reservoir would have incidental value for flood and silt control and for fishing and recreation.

Hurricane Project.- A reservoir of 165,000 acre-feet total capacity (65,000 acre-feet active, and 100,000 acre-feet reserved for silt) on Virgin River at the Virgin City Site three miles northeast of Hurricane, Utah, together with a 27 mile canal extending southwest from the reservoir, would furnish a supplemental supply for 6,500 acres of inadequately irrigated land and a full supply for 14,000 acres of new land, all in the Hurricane-St. George Valley in Utah and Arizona

The existing 1,000 kilowatt power plant at LaVerkin, Utah depen-

(1) Bureau of Reclamation, "Colorado River Report", p. 159.

dent on erratic river flow would be abandoned, and power would be developed at three new plants having a combined capacity of 4,600 kilowatts, and a combined head of 800 feet.

In addition to meeting power replacement and project pumping needs, these plants would produce about 15,000,000 kilowatt hours of firm power annually. The reservoir would also have incidental value for flood control, silt retention, fishing and recreation.

Conclusions:

The Santa Clara Project as outlined by the Bureau of Reclamation, would fully control the Santa Clara River. The proposed Red Cliff Project, outlined above, may be planned to serve efficiently both before and after the building of the Santa Clara Project, as presented by the Bureau of Reclamation.

The Big Creek Reservoir Project on the Virgin River, as proposed by the local water users, may also be planned to serve efficiently both before and after the building of the Hurricane Project.

Summary

Table 43 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 43

PROPOSED RESERVOIR PROJECTS IN WASHINGTON COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost		Area to be Benefited Acres*
			Total	Acre-foot	
Ash Creek	Ash Creek	6,600	\$200,000 (**)		5,000 s
Big Creek	Kolob Creek	2,241	110,500	49	1,800 s
Clay Basin Enlargement	Santa Clara River	936	32,000	34	500 s
Central	Santa Clara River	250	Investigation Required		300 s
Enterprise	Shoal Creek	1,586	60,000	38	4,200 s
Red Cliff	Santa Clara River	1,600	175,000	109	1,300 s
	TOTAL	13,213	\$577,500		13,100. s

TABLE 43. PROPOSED RESERVOIR PROJECTS - (CONTINUED)

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost Total Acre-foot	Area to be Benefited Acre*
<u>Virgin River Development investigated by U. S. B. R.</u>				
Santa Clara Project (Lower Gunlock)	Santa Clara River	23,000 (14,000 active)		1,565 s
Hurricane Project (Virgin City Site)	Virgin River	165,000 (65,000 active)		14,000 n 6,500 s
TOTAL		<u>79,000 active</u>		8,065 s <u>14,000 n</u>

* - s Supplemental supply to inadequately irrigated lands.
n Full supply to new arable lands.

** Preliminary estimate of what the project will cost the sponsoring water users.

*** Total cost does not include Central Reservoir Project costs.

Diversion and Conveyance Needs

There are 35 irrigation companies in Washington County serving approximately 16,500 acres of irrigated land. The distribution systems serving this area consist of approximately 111 miles of main canals with an average intake capacity of 17 c.f.s., and 86 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 10 c.f.s.

Results of the survey, pertaining to needed diversion and conveyance projects, show that 13 irrigation companies have indicated help was required to construct such projects. The proposed projects consist mainly of canal lining, with the ultimate aim of lining their entire distribution systems. Conveyance losses are generally excessive throughout the major part of the existing canals.

From investigations and measurements of conveyance losses on the St. George and Washington Canal, the irrigation company has determined that the loss of water from its intake to the end of the main canal, by seepage, was 6 c.f.s., or 12 acre-feet every twenty four hours.

Adjoining land has become water logged from the same seepage losses, causing a two fold damage, which can be prevented by canal lining. Through the assistance of the Soil Conservation Service, gunite lining has been introduced in this area. This type of canal lining can be installed somewhat cheaper than standard concrete lining.

Summary

Table 44 summarizes the proposed projects, showing the name of the irrigation company, source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 44

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Bench Lake	Virgin River	0.5 miles-canal lining)	3,000	Prel Est.	750
Central Canal	Santa Clara	0.5 miles-canal lining) 1-diversion dam) repair) 1-control) structure)	4,500	"	1,100
Gunlock	Santa Clara River	2.5 miles-canal lining) 4-control) structures)	10,000	"	200
Hurricane	Virgin River	4.0 miles-canal lining) 750 ft. -flume) 16-control) structures)	69,500	"	1,850
LaVerkin Bench	Virgin River	3.5 miles-canal lining) 4-control) structures)	30,000	"	600
St. George-Santa Clara Bench	Santa Clara River	7 miles-canal repairs and) alterations)	14,000	"	800
Seep Ditch	Santa Clara River Seeps	1 mile-canal lining) 1-diversion dam) 2-control) structures)	7,500	"	400
St. George Valley	Virgin River	3 miles-canal lining) 6-control) structures)	15,500	"	500
Middleton Water Users	Springs	1 mile-canal lining) 7-control) structures)	3,000	"	35

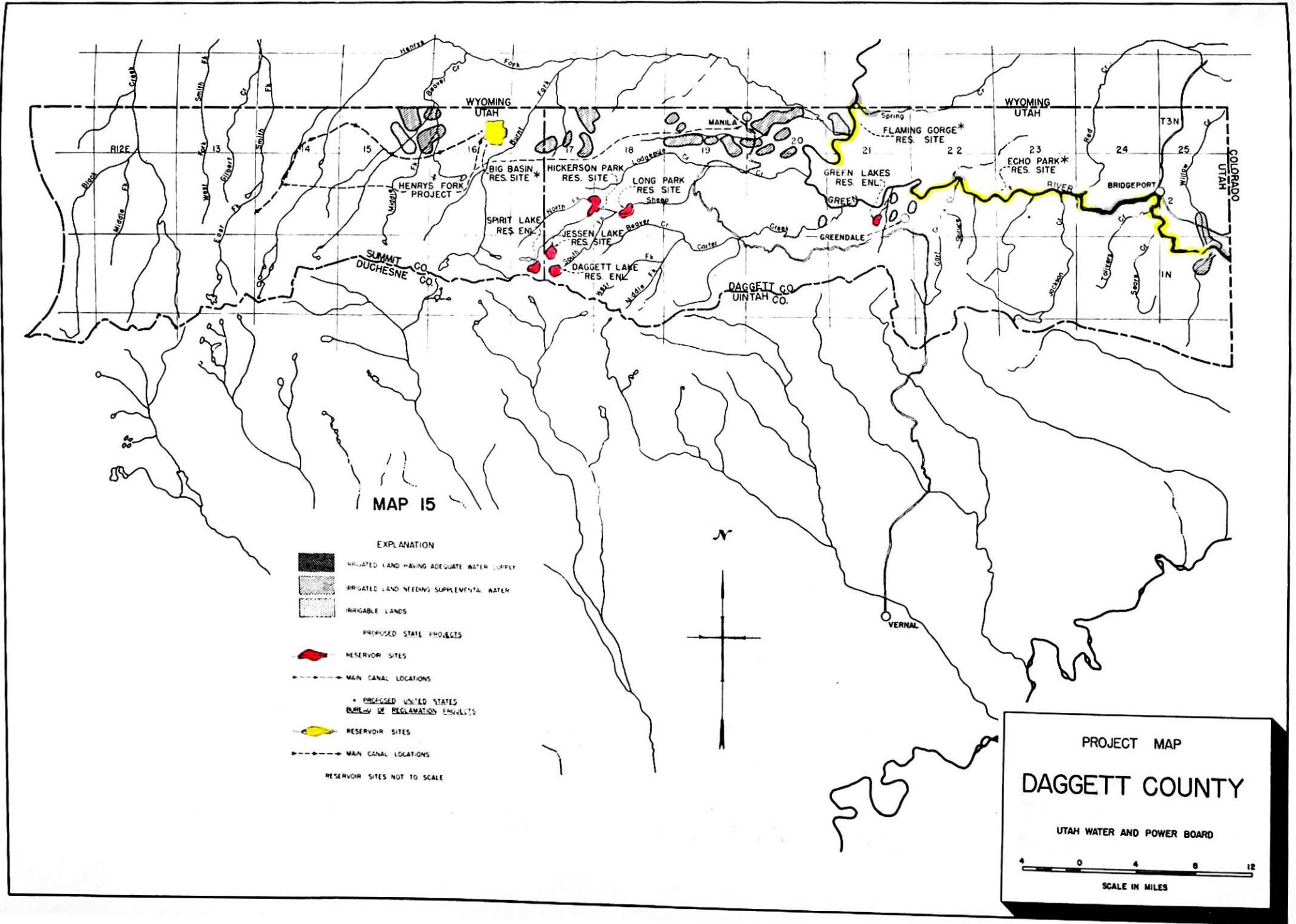
TABLE 44. PROPOSED DIVERSION AND CONVEYANCE NEEDS - CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Bloomington Canal	Santa Clara River Virgin River	1 mile-canal lining) 8-control structures)	10,500	Prel. Est.	250
Virgin Canal	North and Kolob Creeks	0.28 miles-canal lining) 1 mile-canal repair and alteration) 2-control structures)	3,000	"	150
St. George and Washington Canal	Virgin River	5 miles-canal lining)	100,000	"	2,600
TOTAL			\$310,500		10,035

Washington County Summary

Washington County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$577,500
(2) Diversion and Conveyance Projects - - -	<u>310,500</u>
TOTAL	<u><u>\$888,000</u></u>



DAGGETT COUNTY

Introduction

Daggett County lies within the Green River Drainage Area, and is located in the extreme northeast corner of the state. The main sources of supply for the irrigated area are Beaver, Birch, Burnt Fork, and Sheep Creeks. The total irrigated acreage amounts to about 9,300 acres. Of this total, an estimated 4,300 acres are located in the vicinity of Manila, served by Sheep Creek and its tributaries.

Two-thousand acres are served by Beaver Creek, and 2,550 acres are served from Burnt Fork and People's Canal. 450 acres are served from Green Lakes in the Green Dale area. Supplemental water requirements for this area are negligible during the forepart of the irrigation season, but becomes very pronounced during July and August and the latter part of the growing season. Estimates as to the amount in acre-feet that are required for a full supplemental supply are not known.

Serving Daggett County lands are four lakes, Daggett, Spirit Tamarack and Green Lakes, with a capacity of an estimated 1,500 acre-feet. This storage supplements irrigation for an estimated 4,300 acres of irrigated land in the Sheep Creek area, and 450 acres in the Green Dale area. The Beaver Meadows Reservoir, with a capacity of 1,785 acre-feet, located in Summit County, serves an undetermined amount of acres in Utah and Wyoming.

Potential Irrigable Land Development

There are approximately 4,300 acres of arable land which could be provided a full supply in Utah by the proposed Henry Fork Project. The Bureau of Reclamation has made preliminary investigations, and their report was presented in the Colorado River Basin Report.

Proposed Reservoir Projects

Six reservoir projects are outlined as proposed by the water users, to provide additional supplemental storage of water within Daggett County. In addition, one project is outlined as proposed by the Bureau of Reclamation to supplement inadequately irrigated lands and provide a full supply to new lands in this drainage area.

Spirit, Daggett, and Jessen Lakes Reservoir Projects.- The Sheep Creek Irrigation Company proposes to increase the storage capacities of the Spirit and Daggett Lakes by raising the spillways and heights of the dams approximately five feet, and to reservoir Jessen Lake. These projects would increase the available supplemental water supply for an estimated 4,300 acres of irrigated land under the Sheep Creek Distribution System, and would benefit about 60 families. Investigations are in the preliminary stage, with an estimated construction cost of \$15,000.

Long Park Reservoir Project.- The Sheep Creek Irrigation Company proposes to construct a reservoir of 1,600 acre-feet capacity, at a site at the head of Sols Canyon, on Lodge Pole Creek, a tributary of Sheep Creek. This project would provide additional supplemental water for the 4,300 acres of irrigated land, under the Sheep Creek Distribution System, and would benefit about 60 families, with an estimated construction cost of \$85,000.

Hickerson Park Reservoir Project.- (This project is submitted as an alternate to Long Park Reservoir). The Sheep Creek Irrigation Company proposes a reservoir of 5,117 acre-feet capacity at a site on Sheep Creek. This project would benefit 4,300 acres in the Manila area, also 2,500 acres in the Linwood area, which are accessible.

There are about 75 families who would benefit from this project. Preliminary surveys and estimates have been made by the State Engineer's office, with an estimated construction cost of \$257,000.

Green Lake Reservoir Project.- Green Dale Water Users propose to enlarge the Green Lake Reservoir to an estimated 300 acre-feet. This project would provide supplemental water to 450 acres in the vicinity of Green Dale, and would benefit about five families. Investigations are in the reconnaissance stage only, with an estimated construction cost of \$15,000.

U. S. Bureau of Reclamation Project

Henry's Fork Project.- (1)

- - - (1) Bureau of Reclamation's Colorado River Report, p. 114.

Ultimate development of the Colorado River Basin by the Bureau of Reclamation would include the Henry's Fork Project, which would serve lands in Wyoming and Utah. Water would be supplied from tributaries of Henry's Fork to provide a full supply to 4,300 acres of new land, and a supplemental supply to 8,200 acres of inadequately irrigated land located in Utah, in the Manila and Linwood areas.

Summary

Table 45 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 45

PROPOSED RESERVOIR PROJECTS

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost\$		Area to be Benefited Acres*
			Total	Acre-foot	
Spirit Lake	Sheep Creek	400 (**)	5,000	12	
Daggett Lake	Sheep Creek	433 (**)	5,000	11	4,300 s
Jessen Lake	Sheep Creek	100	5,000	50	
Long Park	Sheep Creek	1,600	85,000	53	
Green Lake	Green Lake	500 (**)	15,000	30	450 s
TOTAL		3,033	\$115,000	\$38	4,750 s
Hickerson (***)	Sheep Creek	5,117	257,000	50	6,700 s

U. S. Bureau of Reclamation Project

Henry's Fork	Henry's Fork	107,000			4,300 n 8,200 s
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- * - s - Supplemental supply to inadequately irrigated lands.
 n - Full supply to new arable lands.
 ** - Enlarge existing reservoir.
 ***- Alternate to the Long Park Reservoir Project - not included in total cost.

Diversion and Conveyance Needs

There are only two irrigation companies in Daggett County, however, there are a number of individual irrigators not organized into irrigation companies. The total irrigated area is about 9,300 acres. The major diversion and conveyance needs relative to the distribution systems of Daggett County are:

(1) Cleaning and enlargement of the existing main canals. Past surveys have indicated that the existing canal capacities are too small for the available water supply, especially during the fore-part of the irrigation season.

(2) Repair of diversion structures and installation of adequate measuring devices.

The first project considered in Daggett County was the Sheep Creek canal project, which consisted of enlarging the main Lucerne Valley Canal 20,525 linear feet, and excavation of a new section of a canal 763 linear

feet, located around a rocky point. This section replaced the existing flume structure, which limited the maximum capacity of the canal, and was considered unsafe due to the rotted extent of the wooden flume and supporting trusses. Plans and estimates have been prepared by the Utah Water and Power Board with an estimated construction cost of the project being \$20,000. This project was approved in August 1947, and was partially completed during the fall of the same year. Final completion is anticipated during the fall of 1948.

Future distribution needs of the Sheep Creek Irrigation Company calls for:

(1) Enlargement of an additional three miles of canal, and the construction of a diversion dam and an adequate measuring device at the mouth of Sol's Canyon.

(2) A survey to determine the feasibility of constructing a feeder canal, diverting water from Carter Creek to Sheep Creek, to supplement present water supplies.

Summary

Table 46 summarizes the proposed diversion and conveyance projects, showing the irrigation company, its source of supply, project description, estimated construction cost, status of investigation, and areas to be benefited.

TABLE 46
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS AND REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Birch Creek Water Users	Birch Creek	1.5 miles canal enlargement)	2,000)	Prel. Est.	600
Green Dale Water Users	Lion and Wye Creeks	5.0 miles-canal enlargement) 2.0 miles-new canal)	10,000)	"	450
Sheep Creek	Sheep Creek	6.0 miles-canal enlargement) 800 ft - canal construction)	(*) 20,000)	Complete	4,300

TABLE 46. PROPOSED DIVERSION AND CONVEYANCE NEEDS - (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Sheep Creek (Continued)	Sheep Creek	3.0 miles-canal) (**) enlargement) 1-diversion dam) 1-control) structure) 3.0 miles) feeder canal)	11,500	Prel. Est.	
				Investigation Required	
	TOTAL		\$43,500		4,450

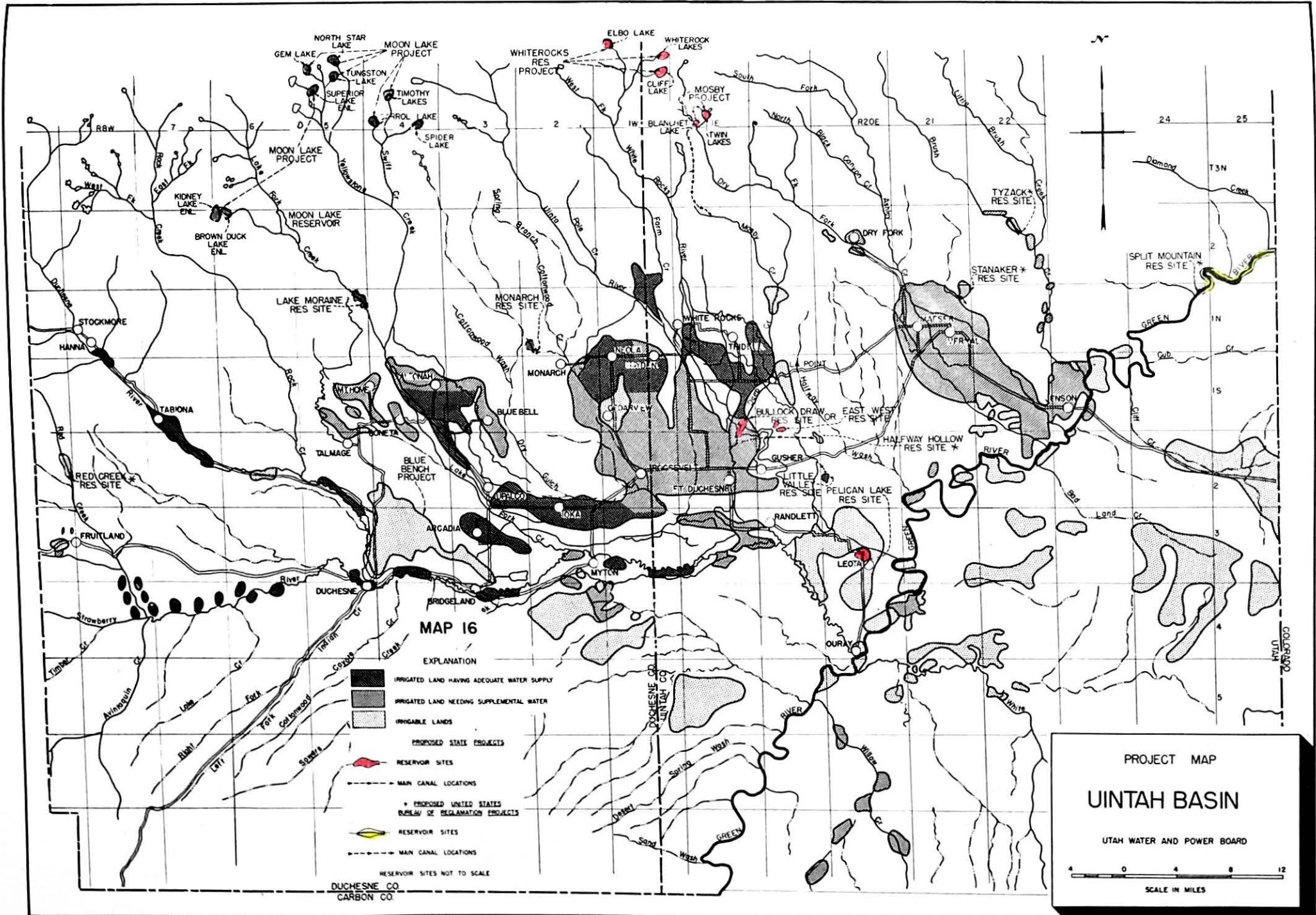
* Approved for investigation and construction. Completion of project anticipated during fall of 1948.

** Proposed future requirements.

Daggett County Summary

Daggett County's estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$115,000.
(2) Diversion and Conveyance Projects - - - -	<u>43,500.</u>
TOTAL	<u>\$158,500</u>



DUCHESNE AND UINTAH COUNTIES (UINTA BASIN)

Introduction

The Uinta Basin lies almost wholly within Uintah and Duchesne Counties. Topographically, the Uinta Basin extends on both sides of the Green River, and includes areas drained on the West by Strawberry River, Rock Creek, Duchesne, Lake Fork, Uinta and Whiterock Rivers in the Duchesne River Drainage; and Dry Fork, Brush and Ashley Creeks in Ashley Valley Drainage.

On the East, the area is drained by Yampa River, White River, and Willow Creek. The Yampa and White River Basins are not included in this investigation; and except for Willow Creek Drainage, the area included is entirely West of the Green River.

In presenting the proposed irrigation developments considered for the Uinta Basin, it should be realized that alternate plans have been proposed for the ultimate development. Final allocation of Colorado River waters between the Upper Basin States will be the controlling factor in deciding on the final plan for the utilization of Utah's share in the Colorado River.

Serving Uinta Basin lands are approximately 31 reservoirs, some very small with a total storage capacity of 74,500 acre-feet. Of this total, 41,545 acre-feet was provided by the United States Bureau of Reclamation with the construction of the Moon Lake Project (1935-38).

Irrigated lands within the Uinta Basin amount to 170,370 acres, and of this total, Indians own about 54,000 acres of the 77,000 acres originally allotted to them. The water rights for these lands are based on claims antedating the proclamation establishing the Uinta Reservation. Consequently the water rights for the allotted lands have first priority to the water of the Duchesne River and its tributaries, leaving the home-steaded lands critically short.

Potential New Land Development

Proposed development of new lands within the Uinta Basin is a part of the proposed Central Utah Project, and includes some areas now under development within the Basin.

Proposed Development of Water Resources

In outlining the proposed irrigation developments within the Uinta Basin, it must be realized the United States Bureau of Reclamation will undertake the construction of developing the ultimate plan to serve this area, along with the diversion of water from the Colorado River Basin to lands in the Bonneville Basin. In this report the proposed developments are outlined in two divisions:

(1) Small storage and conveyance projects which can be undertaken by the Water Users in localized development and conservation of their water resources.

(2) Projects investigated by the U. S. Bureau of Reclamation with alternate schemes proposed. (1)

(1) Source: Bureau of Reclamation, Colorado River Report. Cost estimates are not given for these projects.

Of the projects outlined in (2) above, many of them are considered as alternate proposals, and as the over-all plan is developed, the ones that can be made a functional part of the Basin Development, will be considered for construction, pending complete economic and engineering investigations.

Reservoir Projects Proposed By Water Users

The following projects are outlined as small unit developments within the Uinta Basin, which have been proposed by the local Water Users. Wherever reservoir sites are proposed as an alternate development, with regard to the proposed United States Bureau of Reclamation projects, it has been indicated. A number of these projects can be included in the ultimate development heretofore outlined, without fear of wasted construction or duplication of cost.

Pelican Lake Reservoir Project.- (Also proposed by United States Bureau of Reclamation in Moon Lake Extension project). Ouray Park Irrigation Company proposes a reservoir of an ultimate 12,500 acre-feet capacity at an offstream site, the company's canal from the Uinta River used for direct irrigation of higher lands would be used as a feeder canal during the non-irrigation season. This project would provide a full supply to approximately 3,500 acres of new land in the vicinity of Ouray. Preliminary surveys and costs were made by the irrigation company, with an estimated construction cost for the reservoir being \$20,000.

Whiterocks Reservoir Project.- Ouray Park Irrigation Company proposes to convert three lakes: Cliff Lake, Whiterocks Lake, and Elbo Lake to reservoir storage, with a combined capacity of 1,740 acre-feet. The project will provide additional late-season water supply to the Ouray Valley lands. There are approximately 35 families now living in this area which would benefit from this development. Investigations are in a reconnaissance stage only, with an estimated construction cost of \$50,000.

Bullock Draw Reservoir Project.- (Alternate unit of the Moon Lake Extension Project.) Ouray Park and Uinta Irrigation Companies propose a reservoir of 908 acre-feet at a site on Deep Creek. This project would provide supplemental water to inadequately irrigated lands of the sponsoring irrigation companies. Preliminary survey and cost estimates have been made by the State Engineer, with an estimated construction cost of \$128,700.

Little Valley or Fuller Reservoir Project.- (Alternate unit of the Moon Lake Extension Project). A Ouray Park Irrigation Company proposes a reservoir, at an alternate site located on an off-stream site, approximately ten miles southeast of Gusher. Water could be supplied by the present Whiterock-Ouray Canal with some extensions. This project would benefit the same areas as the proposed Whiterocks and Bullock Draw projects.

East and West Cottonwood Reservoir Projects.- (Alternate units of the Moon Lake Extension Project.) Ouray and Uintah Irrigation Companies propose two reservoirs with a combined capacity of 3,763 acre-feet, at off-stream sites, supplied by waters from the Whiterocks-Ouray Feeder Canal. This project would provide a full supply to 1,000 acres of new land in the Ouray Park area. Preliminary surveys of reservoir sites are complete. No estimate of cost is available.

Mosby Project.- Blanchett Park and Twin Lakes Reservoir Projects. Mosby Irrigation Company proposes to reservoir the Twin Lakes and Blanchett Park Lake on Dry Fork, with a combined capacity of 2,000 acre-feet, and the construction of a canal approximately eight miles long to deliver the water to inadequately irrigated lands in the vicinity of Lapoint. The feeder canal is now under construction. The estimated construction cost of the project is \$25,000. Note: Water supply would be available if Ashley Valley received water from Green River. Development at present may interfere with other rights.

Moon Lake Project.- Moon Lake Water Users, representing water users under the Moon Lake Project, propose to reservoir the following lakes:

- (1) North Star Lake with a capacity of 120 acre-feet, with an estimated construction cost of \$3,600.
- (2) Tungsten Lake with a capacity of 190 acre-feet, with an estimated construction cost of \$9,500.
- (3) Gem Lake with a capacity of 250 acre-feet, with an estimated construction cost of \$10,000.
- (4) Three Timothy Lakes and one Carroll Lake with a combined capacity of 1,000 acre-feet, with an estimated construction cost of \$40,000.
- (5) Spider Lake with a capacity of 100 acre-feet, with an estimated construction cost of \$5,000.

The Moon Lake Water Users also propose to repair the following reservoirs. Construction will consist of replacing outlet works and additional embankment construction for:

(1) Superior Lake Reservoir, with a capacity of 318 acre-feet, with an estimated construction cost of \$5,000.

(2) Brown Duck Group with three lakes, Brown Duck, Kidney, and Island Lakes, with a combined capacity of 4,900 acre-feet, with an estimated construction cost of \$25,000.00

Total estimated cost of the Moon Lake Project - \$98,100.

Monarch Reservoir Project.- Monarch Canal and Reservoir Company proposes a reservoir of 100 acre-feet capacity at a site on Dry Gulch Creek, using the lateral flow from higher lakes and reservoirs, plus high runoff to supply the storage. This project would provide a supplemental supply to 200 acres of inadequately irrigated land in the vicinity of Monarch. There are three families that would benefit from this project. Preliminary surveys and estimates have been made, with an estimated construction cost of \$2,000.

Moraine Reservoir Project.- Moon Lake Water Users propose a reservoir of 1,000 acre-feet capacity at a site on the Lake Fork River. This project would provide a supplemental supply to inadequately irrigated lands in the vicinity of Mt. Home. Preliminary surveys and cost estimates have been made, with an estimated construction cost of \$30,000.

Projects Investigated By The United States Bureau of Reclamation With Alternate Schemes (1)

The reader must realize that further investigations of the Central Utah Project and the division of the water between the Upper Basin States are necessary before feasibility of alternate plans can be determined.

Central Utah Project.- The proposed development within the Uinta Basin, is a part of the Central Utah Project area. Water could be pumped from the potential Echo Park Reservoir, or the Flaming Gorge Reservoir, on Green River to replace irrigation supplies, now used on lands in the Uinta Basin. The construction of this project would eliminate or make unnecessary, most of the features outlined for the Moon Lake Extension, Fruitland, and Mosby Projects.

Moon Lake Project Extension.-North of the Duchesne River, extending from Rock Creek eastward, through the Whiterocks River service area, are 86,200 acres of irrigated land, including some Indian lands that could be brought under cultivation, if storage was provided in the following reservoirs:

----- (1) Bureau of Reclamation's, Colorado River Report, P. 116.

(1) Pelican Lake, 5,200 acre-feet capacity, supplied from Uinta and Whiterocks Rivers: (2) Halfway Hollow, 32,200 acre-feet capacity also supplied from Uinta and Whiterocks Rivers: (3) Upalco, 12,300 acre-feet capacity, storing flows from Yellowstone Creek, and (4) one or more reservoirs at undetermined sites on Rock Creek or other streams capable of releasing an average of 23,000 acre-feet annually to arable lands on the Blue Bench; and if additional yields are provided to replace natural summer flows, exports of water to the Bonneville Basin through the potential Rock Creek tunnel could be increased accordingly.

The first three reservoirs listed would be at offstream sites, but could be fed from existing canals with some modifications and extensions. New construction required would include a service canal from Halfway Hollow Reservoir to Ouray Valley, which would also be usable as a feeder canal for Pelican Lake Reservoir; a six mile extension of the present Yellowstone Canal, now serving the Moon Lake Project, to Uintah River; a three mile canal from Lake Fork River to Yellowstone Creek above the head of the Yellowstone Canal; and a canal from Rock Creek to the Blue Bench and to the Lake Fork River.

Fruitland Project.-(Alternate to Central Utah Project) A storage reservoir of 4,000 acre-feet capacity on Red Creek, a tributary of Strawberry River, with extensions of present service canals would provide water for the irrigation of 1,600 acres of new land, and 400 acres lacking an adequate supply near Fruitland, Utah.

Mosby Project.- Water from Whiterocks River imported by a canal into Deep Creek could be stored in a reservoir of 13,000 acre-feet capacity at the Crow Creek site on Deep Creek to irrigate 3,800 acres of new land and provide supplemental water for 400 acres located about twelve miles west of Vernal, Utah.

Vernal Project.- Storage of Ashley Creek water in Stanaker Reservoir, a potential offstream reservoir of 34,000 acre-feet capacity, would be used to irrigate 1,900 acres of new land, and furnish a supplemental supply to 23,000 acres of cultivated land in Ashley Valley in the vicinity of Vernal. In addition to a dam to impound water in Stanaker Reservoir, a short feeder canal and new service canals would be needed.

Green River Pumping Project.- By pumping water from Green River with lifts of about 40 feet. 11,000 acres of dry land and 1,000 acres of irrigated land between Jensen and Ouray, Utah, could be adequately irrigated. With the present wide fluctuations in river flow, diversion dams cannot be maintained, and occasionally part of the area is inundated. Future upstream power reservoirs would smooth out the flow and make pumping for irrigation practicable.

Jensen Reservoir Project.- (2) A reservoir of 8,000 acre-feet capacity at the Tyzack site on Brush Creek would provide sufficient storage to supply 3200 acres with a supplemental supply, and 1510 acres a full supply on new lands in the vicinity of Jensen, Utah. The project would be incorporated in a comprehensive plan for development of the Colorado River Basin.

- - - (2) Source: Bureau of Reclamation's Jensen Project Report - 1947

Summary

Table 47 summarizes the proposed reservoir projects proposed by local water users for small unit developments, showing name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

Diversion and Conveyance Needs

In presenting the proposed diversion and conveyance needs within the Uinta Basin, the report is outlined under two drainage areas.

(1) Duchesne River and its tributaries.

(2) Ashley Valley drainage area with Ashley and Brush Creeks being the main tributaries.

Duchesne River and Its Tributaries.- This division includes all of Duchesne County and the western part of Uintah County. Serving this area, are approximately 36 irrigation companies, of which 16 have proposed needed diversion and conveyance projects.

So that the reader may more easily understand the organization of the water users within this area, a brief discussion is included of their makeup. The Moon Lake Project constructed by the U. S. Bureau of Reclamation, (1935-38), resulted in the formation of the Moon Lake Water Users Association, to administer the distribution of supplemental water to approximately 75,000 acres of irrigated land, an area which is under the distribution systems operated and maintained by the respective irrigation companies. The Moon Lake Water Users operate and maintain the Yellowstone Feeder Canal and Duchesne Feeder Canal which conveys water from the Duchesne River to a maximum of 10,000 acres of Indian allotted lands, part of which is impounded in the Midview Reservoir during the winter and high water periods.

In outlining the proposed Moon Lake extension project under proposed reservoirs, see page 151, necessary construction of canals for the project was given. However, keeping in mind the Moon Lake extension

TABLE 47

PROPOSED RESERVOIR PROJECTS IN UINTA BASIN
(DUCHESNE AND UINTAH COUNTIES)

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. cost		Area Benefited Acres *
			total	acre-foot	
			\$	\$	
<u>Ouray Park Projects</u>					
Pelican Lake (a)	Uinta River	12,500	20,000	2	3,500 n
Whiterock	Branches of Whiterock River	1,740	50,000	29	3,000 s
Bullock Draw (b)	Deep Creek	908	128,700	142	2,000 s
East and West (a-b)	Uinta River		Investigation Required		1,000 n
Little Valley (a-b)	Uinta River		Investigation Required		
<u>Mosby Project</u>					
Blanchett Lake	Dry Fork	500	(25,000	12	5,000 s
Twin Lakes	Dry Fork	1,500	(
<u>Moon Lake Projects</u>					
Timothy (Carroll Lakes)	Yellowstone River	1,000	40,000	40	
North Star Lake	Yellowstone River	120	3,600	30	
Tungsten Lake	Yellowstone River	190	9,500	50	
Gem Lake	Yellowstone River	250	10,000	40	75,000 s
Superior Lake (c)	Yellowstone River	318	5,000	16	
Brown Duck Lakes (c)	Yellowstone River	4,900	25,000	5	
Spider	Lake Fork River	100	5,000	50	
Monarch	Dry Gulch Creek	100	2,000	20	
Moraine	Lake Fork River	1,000	30,000	30	
TOTAL		25,126	353,800	14	3,500 n <u>85,000 s</u>

(a) Offstream site: (b) Alternate site to proposed Moon Lake Extension Project.
(c) Replace outlet works - no increase in capacity; (d) East and West and Little Valley not included.

* Area benefited: s - supplemental supply to presently irrigated lands
n - full supply to new arable lands.

project is an alternate scheme in the ultimate development and that certain canal extensions are necessary in the near future, the major proposed canal extensions and construction are summarized, as proposed in this area.

(1) Ouray Park Irrigation Company proposes three miles of canal realignment with a capacity of 140 c.f.s. diverting from Uinta River and connecting with a canal formerly diverting from the same source one and a half miles downstream, to irrigate land served by the Ouray Park Irrigation Company with direct flow water, and also to serve as a feeder canal for proposed reservoirs in that area. Investigations and estimates are complete with an estimated construction cost of \$32,000. This project has been approved by the Utah Water and Power Board, and is now under construction.

(2) Dry Gulch and T. N. Dodd Irrigation Companies proposed six miles of new canal, extending the present Yellowstone Canal to Uinta River. This canal serves lands in the vicinity of Neola and Bennett, with a preliminary estimated construction cost of \$30,000.

(3) Blue Bench Water Users propose a canal from Rock Creek to Blue Bench to serve approximately 16,000 acres of new land. Preliminary surveys have been made by the U. S. Bureau of Reclamation. One plan calls for a 12.8 mile canal to serve 11,750 acres with an estimated construction cost of \$500,000. This project has received approval from the Utah Water and Power Board for consideration and further analysis of its possibilities.

(4) Mosby Irrigation Company proposes to complete eight miles of canal from Dry Fork to serve in the vicinity of LaPoint, of which the greater part has been completed, with an estimated construction cost of \$25,000. This includes the cost of reservoiring Blanchett and Twin Lakes. Project was listed on Page 149.

Ashley Valley Drainage Area. (Uintah County)

There are thirteen irrigation companies in this drainage area serving approximately 30,000 acres of irrigated land. Results of this survey show that nine irrigation companies have proposed diversion and conveyance projects.

Any major distribution construction should be carefully analyzed to become a part of the proposed ultimate development of the Ashley Valley Drainage Area, which is under investigation by the Bureau of Reclamation. It is assumed that the ultimate development of this area will require modifications and extensions of the present distribution systems.

Summary

Table 48 summarizes the proposed diversion and conveyance projects for the distribution systems in Uinta Basin, showing the name of the irrigation company, source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 48

PROPOSED DIVERSION AND CONVEYANCE NEEDS AND ESTIMATED
COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be benefited-acres
<u>Duchesne River and Tributaries</u>					
Blue Bench	Rock Creek	13.0 miles-canal)	Invest. required	Prel. Est.	16,000
Dry Gulch & T. N. Dodd	Uinta- Lake Fork Rivers	6.0 miles canal) extension 1-diversion dam) 12-control) structures )				44,000	34,000
Farm Creek	Duchesne River	1-diversion dam) 1-control) structure)	5,500	"	1,567
Farnsworth	Lake Fork	2.0 miles-canal) repairs)	5,000	"	10,700
Little Farm Creek	Farm Creek	7.0 miles-canal) enlargement) 100 ft.-flume) replacement) 15-control) structures)	6,000	"	340
Monarch Canal & Reservoir	Duchesne River Dry Gulch Creek	1-diversion dam) 10 miles-canal) enlargement) 6-control) structures)	2,000	"	469
Moon Lake Water Users	Lake Fork River	1.0 mile-canal) lining) Yellowstone) Feeder Canal)	22,000	"	

TABLE 48 - (Continued) - PROPOSED DIVERSION AND CONVEYANCE NEEDS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Ouray Park	Uinta and Whiterocks Rivers	3.0 miles ^(*) canal realignment	32,000	Complete	5,000
Red Creek	Red Creek Duchesne River	12-control structures)	2,000	Prel. Est.	1,200
Rhodes Ditch	Duchesne River Big Springs	0.25 mile-canal lining)	3,800	"	950
Tabby	Duchesne River	1-diversion dam) 2-control structures)	4,400	"	725
Uinta Basin	Duchesne River	0.23 mile-canal lining) 1-control structure)	6,700	"	4,000
Uinta Independent Ditch	Uinta River	100 ft.-flume)	1,500	"	4,076
Uinta River	Uinta & Whiterocks Rivers	7.0 miles-canal lining) 32-control structures) 9.0 miles-canal enlargement)	106,000	"	2,044
Big Spring Ditch	Big Spring Duchesne	1.35 miles-canal realignment) 1-diversion dam) 100 ft-flume) 2-control structures)	4,000	"	330
Wiliken Sons	Swift Creek North Fork Duchesne	0.5 miles-canal re-alignment) 2-control structures)	1,000	"	80
Duchesne River & Tributaries - TOTAL			<u>\$ 245,900</u>		<u>77,231</u>

TABLE 48 -(Continued) - PROPOSED DIVERSION AND CONVEYANCE NEEDS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be benefited Acres
<u>Ashley Valley Drainage Area</u>					
Ashley Upper	Ashley Creek	2.0 miles-canal) lining) 1-diversion dam) 1-control) structure)	94,500	Prel. Est.	8,820
Burton Ditch	Brush Creek	2.5 miles-canal) enlargement) 1-diversion dam) 2-control) structures)	1,000	"	550
Clinesward	Springs	5.0 miles-pipe) line, culinary) system)	60,000	"	70 families
High Line Canal	Ashley Creek	0.75 mile-canal) lining) 2.0 miles-canal) lining) 1-diversion dam) 1-Control) structure)	60,000	"	1,500
Island Ditch	Ashley Creek	2.0 miles-canal) lining) 15-control) structures)	28,600	"	750
Little Brush Creek	Little Brush Creek	4-diversion dams) 8-control) structures)	4,500	"	165
Murray Ditch	Brush Creek	2.0 miles-canal) enlargement &) repair) 1-diversion dam) 115 ft.-flume)	7,500	"	500
Rock Point Canal	Ashley Creek	2.0 miles-canal) lining) 0.5 miles-canal) realignment) 100 ft. - flume)	40,000	"	1,600

TABLE 48 - (Continued) - PROPOSED DIVERSION AND CONVEYANCE NEEDS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Union Canal	Lower Ashley Creek	1.0 mile-canal enlargement & repair 1-diversion dam 2-control structures	4,000	Prel. Est.	2,000
ASHLEY VALLEY DRAINAGE AREA - TOTAL			\$300,100		15,885
DUCHESNE RIVER DRAINAGE - TOTAL			245,900		77,231
UINTAH BASIN - - TOTAL			\$ 546,000		93,116

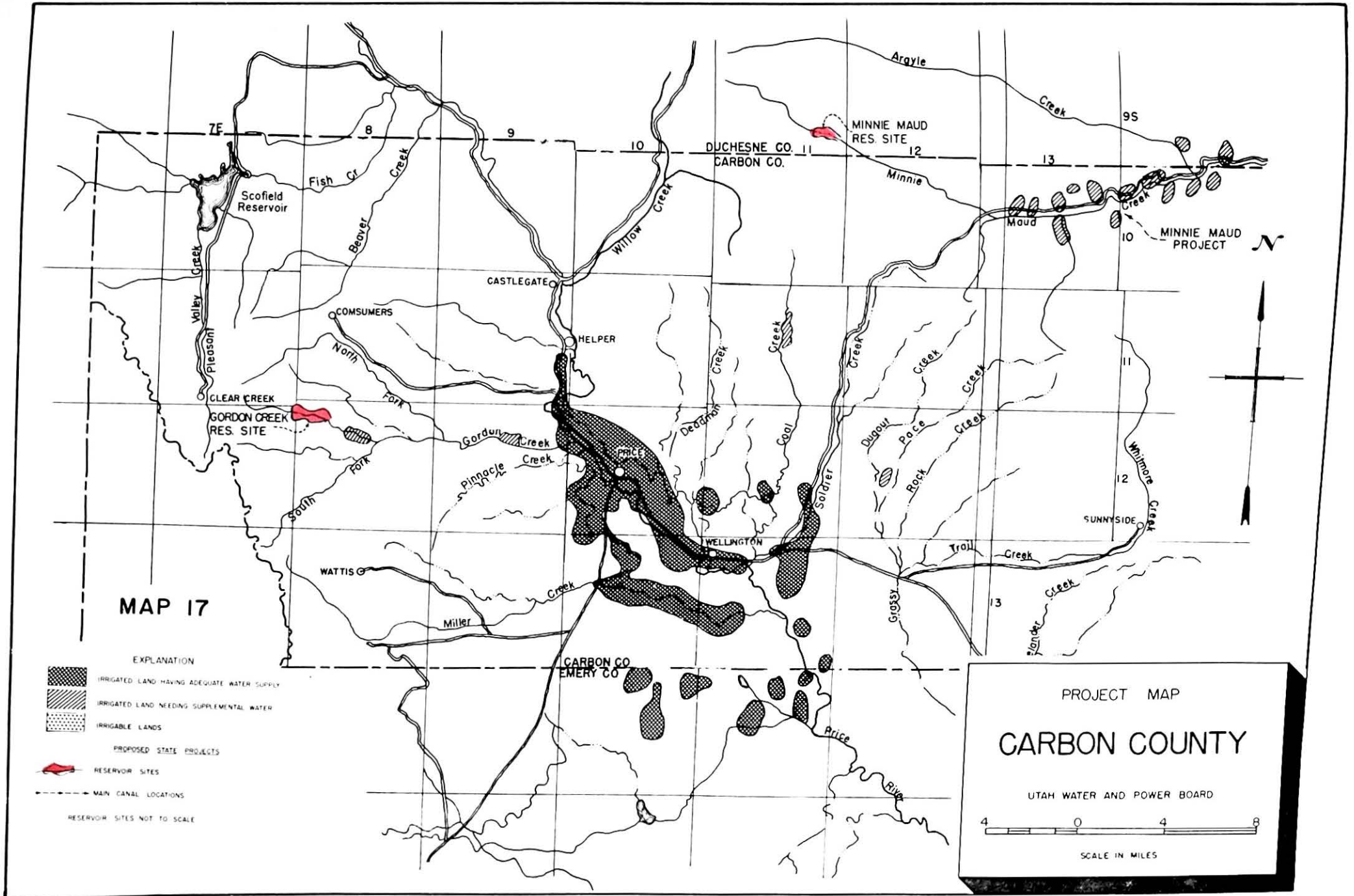
- - -(*) Project approved for construction.

Uinta Basin Summary

(Duchesne and Uintah Counties -)

Uinta Basin's total estimated cost for the proposed distribution and storage developments, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$353,800
(2) Diversion and Conveyance Projects -	546,000
TOTAL -	<u>\$899,800</u>



C A R B O N C O U N T Y

Introduction

Carbon County lies within the Price River and the Green River Drainage Areas. Present development of the water resources is outlined under each area.

Price River Drainage Area

The principal stream is the Price River, which originates on the east slopes of the Wasatch National Forest and flows southeast to the Green River. The major tributaries are White River, Fish, Gooseberry, Willow, Gordon, Coal, Miller, and Soldier Creeks.

Within this area, approximately 17,000 acres are irrigated, of which an estimated 16,000 acres has a full supply, being provided supplemental water from the Scofield Reservoir. Approximately 1,000 acres served by Gordon, Coal, Soldier, and Grassy Trail Creeks require an estimated 1,000 acre-feet of supplemental water.

Present storage developments, consist of three reservoirs with a combined capacity of 74,280 acre-feet, serving approximately 17,000 acres. Of this total 73,000 acre-feet of storage is provided in the Scofield Reservoir.

The old Scofield Dam was replaced by the Bureau of Reclamation in 1945. The reservoir formed by the new dam, has a total capacity of 73,000 acre-feet, 30,000 acre-feet of which replaced the usable capacity behind the old dam, and 8,000 acre-feet is reserved for fish propagation. The remaining 35,000 acre-feet is held for a time by the United States, and is ultimately to be used to store water for irrigation of Price River lands in exchange for other water exported from high tributaries from the Price River to the Bonneville Basin.

Green River Drainage Area

This area is located in the northeast portion of Carbon County and extends into the southern part of Duchesne County. The Minnie Maud and Argyle Creeks are the principal streams which flow east to a junction with Green River.

The total irrigated area is approximately 800 acres, with a required supplemental supply estimated at 550 acre-feet.

Proposed Reservoir Projects

Price River Drainage Area.— Referring to the present storage development in Carbon County, the irrigated area under the Price River distribution system can be fully supplied by present storage. Isolated areas which can not be served, such as the irrigated land above the Carbon Canal on Gordon Creek, amounting to approximately 400 acres, approximately 100 acres seven miles north of Wellington, adjacent to Coal Creek, and 300 acres served by the Grassy Trail

Creek in Clark's Valley, needs supplemental water.

The feasibility of storage on Coal Creek, or Grassy Trail Creek, is very remote, leaving Gordon Creek as the only one which appears practical enough to justify a more detailed survey. Therefore, only one reservoir project is outlined in this drainage area. The proposed reservoir project would supply an estimated 700 acre-feet, to be applied to approximately 400 acres now inadequately irrigated.

Potential development of storage on the White River will be developed as a culinary supply, by the cities of Price and Helper. Estimates for this project are not available, and it is assumed that this project will not be handled by the Utah Water and Power Board.

Green River Drainage Area.— One reservoir project is outlined for the development of the water resources in this area. The proposed development would provide a supplemental supply for the 800 acres now inadequately irrigated.

The proposed reservoir projects are described by drainage areas.

Price River Drainage Area

Gordon Creek Reservoir Project.— Gordon Creek Water Users propose a reservoir with a capacity of 700 acre-feet at a site on Gordon Creek located approximately 12 miles northwest of Price. The project will provide supplemental supply to approximately 400 acres of inadequately irrigated land adjacent to Gordon Creek and above the Carbon Canal.

It is estimated that five families would directly benefit from this project. Investigations are in a reconnaissance stage only. The estimated construction cost is \$46,000.

Green River Drainage Area.

Minnie Maud Reservoir Project.—⁽¹⁾ Minnie Maud Irrigation Company proposes a reservoir of 550 acre-feet capacity at a site on Minnie Maud Creek. The project will provide a supplemental supply to 800 acres of inadequately irrigated land bordering Minnie Maud Creek, along the Duchesne-Carbon County boundary. Ten families would directly benefit from this project. Extent of investigation - preliminary surveys and cost estimates made by the State Engineer's office. The estimated construction cost is \$100,000.

- - - (1) Also mentioned in the Bureau of Reclamation's Colorado River Report, p. 117.

Summary

Table 49 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 49

PROPOSED RESERVOIR PROJECTS

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost \$ Total	Estimated Acre-foot	Area to be Benefited Acres*
<u>Price River Drainage Area</u>					
Gordon Creek	Gordon Creek	720	46,000	64	400 s
<u>Green River Drainage Area</u>					
Minnie Maude	Minnie Maude Creek	550	100,000	180	800 s
TOTAL		<u>1,270</u>	<u>146,000</u>	<u>\$115</u>	<u>1,121 s</u>

* s - Supplemental supply to inadequately irrigated lands.

Diversion and Conveyance Needs

There are 13 irrigation companies in Carbon County serving approximately 17,300 acres of irrigated land. The distribution system serving this area, consists of 61 miles of main canals with an average intake capacity of 90 c.f.s., and 52 miles of laterals over 4 c.f.s., with an average intake capacity of 14 c.f.s.

Approximately 16,000 acres receive supplemental water from the Scofield Reservoir, which was rebuilt by the Bureau of Reclamation. The major distribution need lies in lining, repair, and enlargement of the existing distribution system to carry the available Scofield Reservoir water.

Results of the survey of diversion and conveyance needs in Carbon County, shows that five irrigation companies have proposed needed diversion and conveyance projects.

A pipe line project has been proposed to convey water from Dugout Canyon Creek to irrigate 100 acres of inadequately irrigated land in Clark Valley. Available water supply is the controlling factor which retards development in this arable valley, where over 1,500 acres were once reported under cultivation.

Summary

Table 50 summarizes the proposed diversion and conveyance projects showing the name of the irrigation company, source of supply, project description, estimated construction cost, status of investigation, and areas to be benefited.

TABLE 50

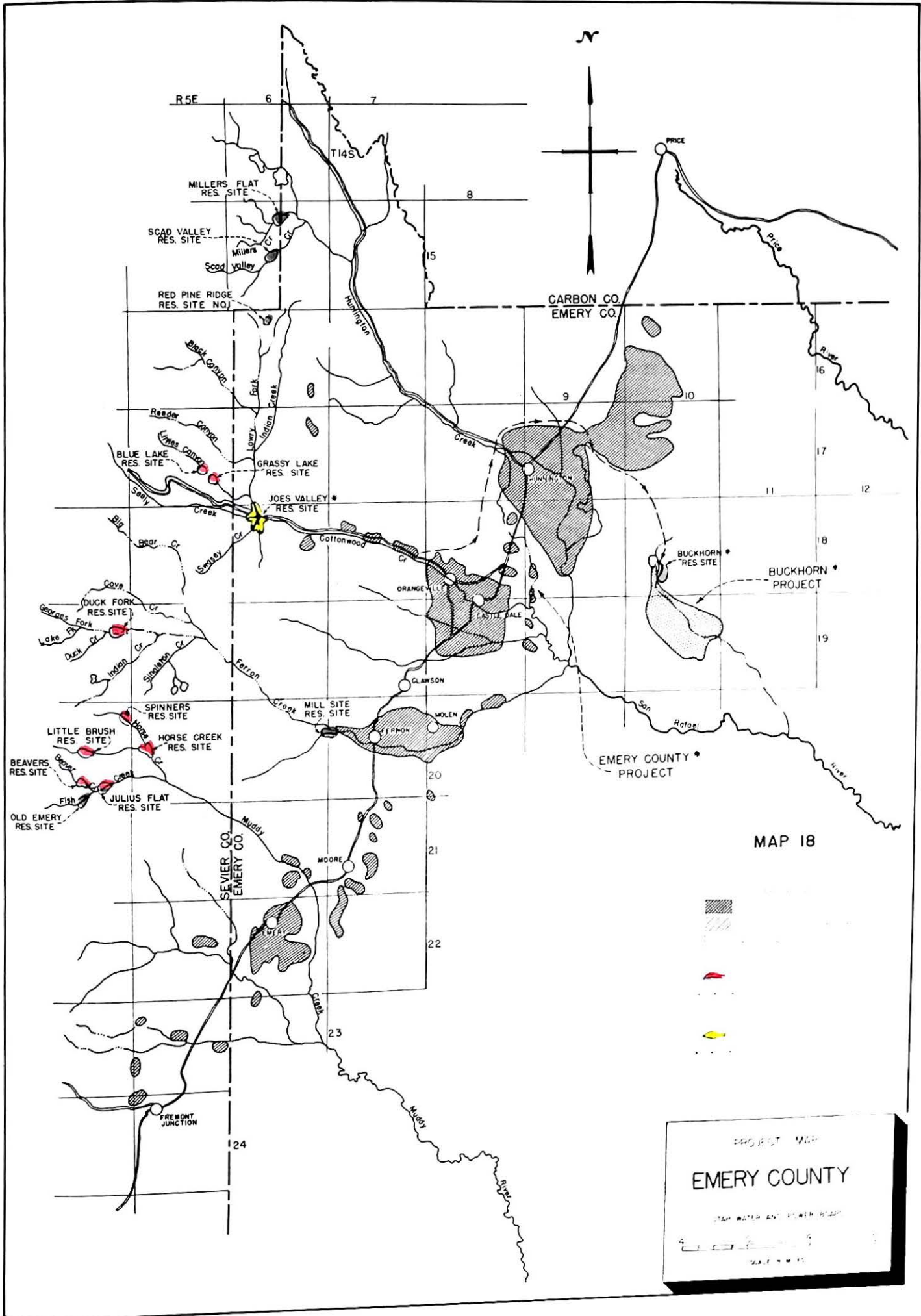
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS AND REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Reynolds	Dugout-Pace and Rock Canyons	2.5 miles-pipe line)	15,000	Prel.	100
Price Wellington	Price River Scofield Reservoir	5.0 miles-canal lining)	132,000	"	5,780
Lower Gordon Creek	Gordon Creek	1-diversion dam) 2 miles-canal) repairs and) alterations)	2,000	"	330
Coal Creek Ranch	Coal Creek	1-diversion dam)	1,000	"	130
Stowell Water	Price River Scofield Reservoir	1-diversion dam) 2 miles-canal) repair and) alteration) 16-control) structures)	2,100	"	200
TOTAL			<u>\$152,100</u>		<u>6,540</u>

Carbon County Summary

Carbon County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation projects).

(1) Reservoir Projects - - - - -	\$146,000.
(2) Diversion and Conveyance Projects - - - - -	<u>152,100</u>
TOTAL	<u>\$298,100</u>



EMERY COUNTY

Introduction

Emery County lies within the San Rafael River, Muddy River, and the Green River drainage areas. The present development of the water resources is outlined under each area.

San Rafael River Drainage Area

This area lies in the northwest portion of Emery County, with the head waters draining the eastern slopes of the Wasatch Mountains. The San Rafael River is formed seven miles southeast of Castle Dale by the confluence of its three principal tributaries, Huntington Creek, Cottonwood Creek, and Ferron Creek, all issuing from the Wasatch Range. The river then flows southeast 70 miles through waste lands or semi-desert grazing areas to the Green River.

These streams serve an estimated 35,840 acres in the vicinity of Huntington, Castle Dale, Ferron, and Orangeville areas, with a supplemental water requirement estimated at 35,000 acre-feet.

Present reservoir development in this drainage area amounts to 5,875 acre-feet on Huntington Creek, and 1,310 acre-feet on Ferron Creek. Lake season water shortages are most acute in the Huntington area, where the acreage irrigated is greatest in proportion to the available water.

Muddy River Drainage Area

This area lies in the west portion of Emery County, with the head waters of the Muddy River draining the eastern slopes of the Wasatch Range, south of the San Rafael River Drainage. The Muddy River is formed by the confluence of Beaver, Fish, and Horse Creeks, and flows in a southeasterly direction, making a junction with the Fremont River in Wayne County, and extending in the southernly direction joining the Colorado River on the eastern boundary of Garfield County.

The irrigated area amounts to approximately 8,000 acres serving in the vicinity of Emery and Rochester, with an estimated supplemental requirement of 6,500 acre-feet. Present storage development consists of six reservoirs, four listed under 100 acre-feet capacity, and two under 1,000 acre-feet.

Green River Drainage Area

This area includes adjoining lands to the Green River proper, in the southeastern part of Emery County. The irrigated area amounts to approximately 2,400 acres in the vicinity of Green River, served by the

Green River proper, both from gravity diversions and pumping installations.

Potential Irrigable Land Development

The United States Bureau of Reclamation has submitted a report on the Emery County project which consists of two units, Joe's Valley Reservoir with a proposed capacity of 57,000 acre-feet, and the Buckhorn Reservoir with a capacity of 15,000 acre-feet. New land to be benefited with a full supply is estimated at 7,100 acres.

The Gunnison Valley Pumping Project would provide a full supply to 10,400 acres, 3,800 acres west of Green River, and 6,600 acres east of Green River.

Proposed Reservoir Projects

Thirteen reservoir projects are outlined for development of the water resources within this county. The irrigation of 7,100 acres of dry arable land, and 43,100 acres of cultivated land, lacking a full supply would be possible.

Proposed development of reservoir projects is discussed in more detail under the three drainage areas.

San Rafael River Drainage Area

Six projects are outlined in the Huntington-Cleveland Creek Drainage, four being classified as small reservoir storage projects, and two being basin developments which are potential projects submitted by the Bureau of Reclamation.

Red Pine Ridge Reservoir Project.- The Cottonwood Consolidated Irrigation Company proposes to repair and enlarge the small reservoir referred to as the number one on Red Pine Ridge. The project plan consists of replacing the outlet and the repair of the existing dam to hold a capacity of 45 acre-feet.

There are approximately 1,500 people that would benefit from this project. The Soil Conservation Service Engineers are completing the field investigations with an estimated construction cost of \$2,000.

Blue and Grasse Lake Reservoir Projects.- The Cottonwood Consolidated Irrigation Company proposes to convert Blue Lake into a reservoir of an estimated 70 acre-feet, and to repair the existing dam on the Grasse Lake to safely provide storage for an estimated 140 acre-feet.

There are approximately 1,500 people that would benefit from these projects. The Soil Conservation Service Engineers are completing the field investigations. The estimated construction cost for the two projects is \$6,000.

Miller's Flat Reservoir Project.- The Huntington-Cleveland Irrigation Company proposes to impound 2,450 acre-feet of water from Miller's Flat Creek. The project will furnish supplemental water to an estimated 5,000 acres in the vicinity of Huntington and Cleveland, and would benefit approximately 600 families. Construction has begun and is about 50 per cent complete. The estimated cost to complete the project is \$20,000.⁽¹⁾

- - -(1) Cost estimate given by sponsor's engineers.

Scad Valley Reservoir Project.- The Huntington-Cleveland Irrigation Company proposes to impound 577 acre-feet of water in Scad Valley Creek. This project will furnish supplemental water to 1,000 acres of inadequately irrigated land, in the vicinity of Huntington and Cleveland, and would benefit approximately 600 families. Preliminary surveys and estimates have been made by the State Engineer's office, with an estimated construction cost of \$55,000.

U. S. Bureau of Reclamation Projects (2)

- - -(2) Bureau of Reclamation, Colorado River Report, p. 118.

Joe's Valley Reservoir Project.- This project consists of a reservoir of 57,000 acre-feet capacity at a site on Cottonwood Creek to be used as a supplemental supply for approximately 20,000 acres now inadequately irrigated, and a full supply to 3,300 acres of dry land, in the vicinity of Huntington and Castle Dale. Necessary field investigations and estimates have been completed by the Bureau of Reclamation.

Buckhorn Reservoir Project.- This project consists of a reservoir of 15,000 acre-feet capacity, supplied by waters from Huntington Creek, by enlargement and extension of the Cleveland Canal to carry its surplus waters. This project will provide a full supply for 3,800 acres of new land, located about 12 miles east of Castle Dale.

Summary

It should be realized that the location of the above proposed small reservoirs, are located toward the head waters of the respective drainage areas, and would serve as additional control and regulation of water that would be stored in larger storage reservoirs located downstream.

Assuming ultimate development of this area, it would appear that if the small projects are found feasible and are constructed, it would not seriously interfere with the ultimate basin plan proposed by the Bureau of Reclamation, and would assist greatly in supplying needed supplemental water in the near future, while awaiting larger basin development.

San Rafael River Drainage (Ferron Creek and Tributaries)

Three reservoir projects are proposed having the total estimated capacity of 4,400 acre-feet, to serve approximately 9,000 acres with needed supplemental water.

Duck Fork Reservoir Project.- Ferron Canal and Reservoir Company and the Molen Ditch and Reservoir Company proposes to impound an estimated 1,000 acre-feet of water from Ferron Creek. This project will furnish supplemental water to an estimated 2,000 acres in the vicinity of Ferron and Molen, and will benefit approximately 2,500 people. This project was 60 per cent complete in the spring of 1948. The estimated construction cost to complete this project is \$20,000.

Mill Site Reservoir Project.- Ferron Canal and Reservoir Company and the Molen Ditch and Reservoir Company proposes to impound an estimated 2,376 acre-feet of water from Ferron Creek, located at a site about three miles northwest of Ferron. Approximately 2,500 people would benefit from this development. Preliminary surveys and cost estimates have been made by the State Engineer's office, with an estimated construction cost of \$326,000.

Muddy River Drainage and Tributaries

Six reservoir projects are proposed with a combined capacity of approximately 3,000 acre-feet, to serve an estimated 5,900 acres with supplemental water.

Beaver Reservoir Project.- Emery Canal and Reservoir Company proposes to impound 200 acre-feet of water at a site on Beaver Creek. This project will furnish supplemental supply to an estimated 400 acres in the vicinity of Emery, and would benefit approximately 650 people. Investigations are in a reconnaissance stage only. No estimates of cost are available.

Horse Creek Reservoir Project.- Independent Canal and Reservoir Company proposes to impound 700 acre-feet of water on the Horse Creek Branch of the Muddy River. This project will furnish supplemental water to an estimated 1,400 acres in the vicinity of Moore, and would benefit about 200 people. Investigations are in a reconnaissance stage only. No estimates of cost are available.

Julius Flat Reservoir Project.- Independent Canal and Reservoir Company proposes to increase the capacity of the present reservoir from 250 to 900 acre-feet with waters of Fish Creek. This project will furnish supplemental water to an estimated 1,200 acres in the vicinity of Moore, and would benefit approximately 200 people. Preliminary surveys and estimates have been made by the Soil Conservation Service with an estimated construction cost of \$45,000.

Little Brush Reservoir Project.- Independent Canal and Reservoir Company proposes to increase the capacity of the present reservoir from 340 to 600 acre-feet, using waters from the Muddy River. This project would furnish a supplemental supply to an estimated 600 acres in the vicinity of Moore, and would benefit about 200 people. Investigations are in a reconnaissance stage only, with an estimated construction cost of \$30,000.

Old Emery Reservoir Project.- Independent Canal and Reservoir Company proposes to increase the capacity of the present reservoir from 350 to 552 acre-feet, supplied by the waters of the Muddy River tributary. This project will furnish supplemental supply to an estimated 400 acres in the vicinity of Moore, and would benefit about 200 people. Preliminary surveys have been made by the Soil Conservation Service, with an estimated construction cost of \$7,000.

Spinners' Reservoir Project.- Independent Canal and Reservoir Company proposes to impound 700 acre-feet of water from the Muddy River and Spring Run-off, at a site located on the head waters of the Muddy River drainage. This project will furnish supplemental water to an estimated 1,400 acres in the vicinity of Moore, and would benefit approximately 200 people. Investigations are in a reconnaissance stage only, with an estimated construction cost of \$42,000.

Summary

Table 51 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 51

PROPOSED RESERVOIR PROJECTS

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost Total Acre-foot		Area to be Benefited Acres*
<u>Huntington-Cottonwood Creek and Tributaries</u>					
<u>Proposed Bureau of Reclamation Projects</u>					
Joe's Valley	Cottonwood Creek	57,000			3,300 n 20,000 s
Buckhorn	Huntington Creek	15,000			3,800 n
	TOTAL	72,000			20,000 s 7,100 n
<u>Proposed State Projects</u>					
Red Pine Ridge #1	Potters Creek	45	2,000	44	100 s
Blue Lake	Littles Creek	70	3,000	43	140 s
Grassy Lake	Littles Creek	140	3,000	22	300 s
Miller's Flat	Miller's Flat Creek	2,450	20,000(**)	81	5,000 s
Scad Valley	Scad Valley Creek	577	66,000	114	1,000 s

TABLE 51. PROPOSED RESERVOIR PROJECTS - (CONTINUED)

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost* Total Acre-foot	Area to be Benefited Acres*
<u>Ferron Creek and Tributaries</u>				
Duck Fork	Ferron Creek	1,000	20,000(**) 20	2,000 s
Mill Site	Ferron Creek	2,876	325,000 113	6,000 s
<u>Muddy River and Tributaries</u>				
Beaver	Beaver Creek	200	Investigation Required	400 s
Horse Creek	Horse Creek	900	Investigation Required	1,400 s
Julius Flat	Fish Creek	900(***)	45,000 50	1,200 s
Little Brush	Muddy River	600(***)	30,000 50	600 s
Old Emery	Muddy River	552(***)	7,000 12	400 s
Spinners	Muddy River	700	42,000 60	1,400 s
TOTAL(*****)		10,010	\$564,000.	19,940

* s - Supplemental supply to inadequately irrigated lands.
n - Full supply to new arable lands.

** Cost to complete.

*** Increase capacity.

**** Total cost does not include Beaver and Horse Creek Reservoir Projects.

Diversion and Conveyance Needs

There are ten irrigation companies in Emery County, serving approximately 45,000 acres of irrigated land. The distribution systems serving this area consist of approximately 148 miles of main canals with an average intake capacity of 109 c.f.s., and 39 miles of laterals of 4.c.f.s. capacity, with an average intake capacity of 14 c.f.s.

The results of a survey show that four irrigation companies have proposed needed diversion and conveyance projects. The irrigation companies list their major needs as canal lining, repair or replacement of existing diversion dams, and canal realignment in certain sections of the main system.

There are no reports available concerning exact seepage losses in the canals listed as needing lining. However, the water users are aware that their losses are excessive and there is a need for extensive measurements to determine the amount of water lost, and also to isolate the sections where the greatest losses occur.

Summary

Table 52 summarizes the proposed diversion and conveyance projects, showing the name of the irrigation company, source of supply, project description, estimated construction cost and areas to be benefited.

TABLE 52

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

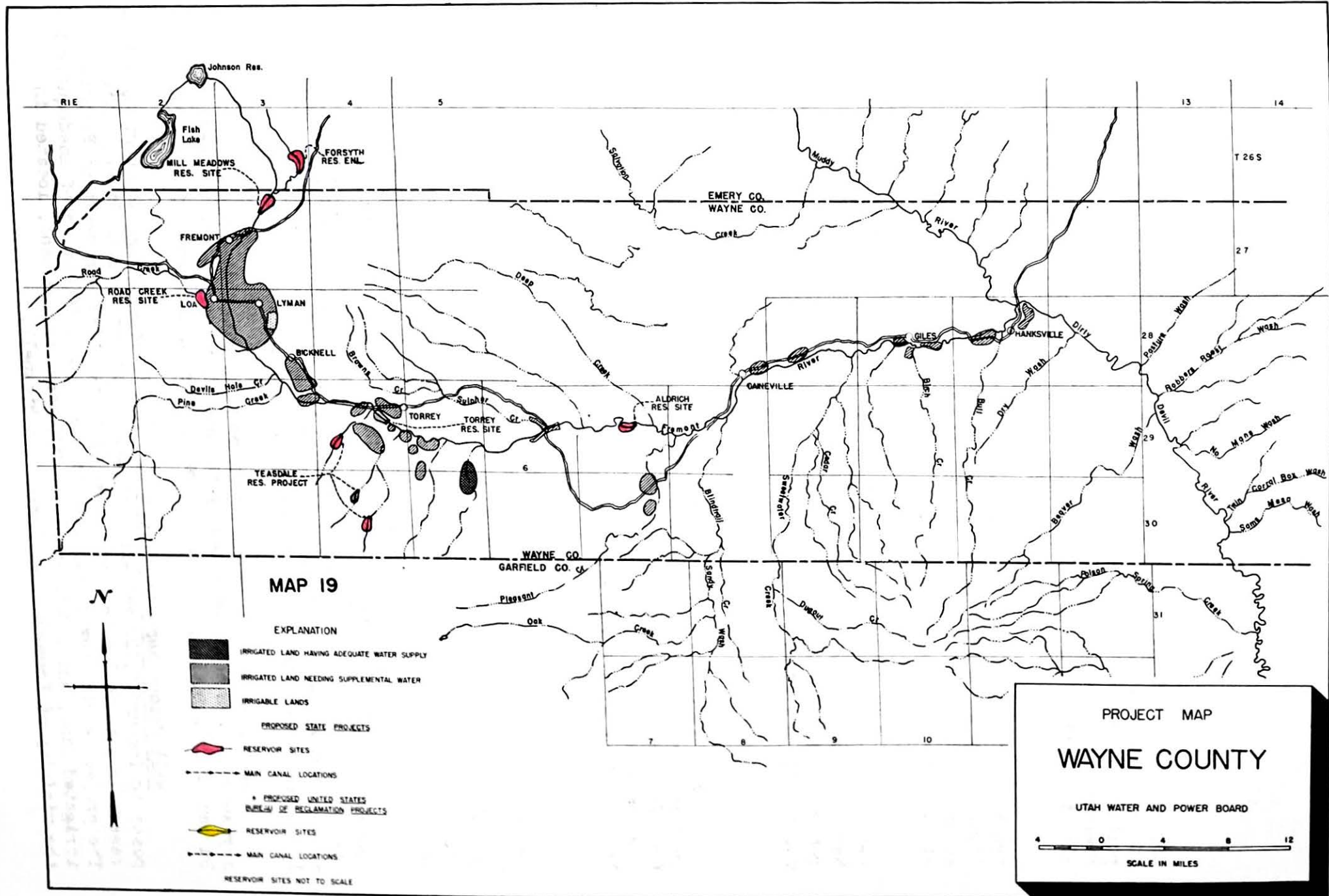
Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Emery Canal and Reservoir	Muddy River	2 miles-canal) lining) 300 ft.-canal) realignment) 1-diversion dam) repair)	73,700	Prel. Est.	6,000
Ferron Canal and Molen Ditch	Ferron Creek	0.5 mile-canal) lining) 155 ft.-flumes) replacement) 2-diversion dams) 3-control) structures)	35,500	"	15,150
Huntington Cleveland	Huntington Creek	10.0 miles-) canal lining) 2,000 ft.-canal) realignment) 20 miles-canal) enlargement) 7-control) structures)	253,700	"	23,000
Independent Canal and Reservoir	Muddy Creek	0.37 mile-canal) canal) realignment) 75 ft. - flume) 3-control) structures)	20,000	"	2,400
TOTAL			<u>\$382,900</u>		<u>46,450</u>

Emery County Summary

Emery County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$564,000.
(2) Diversion and Conveyance Projects - - - - -	382,900.
TOTAL	<u>\$946,900</u>

(172)



WAYNE COUNTY

Introduction

Wayne County lies within the Fremont River drainage area. The major stream is the Fremont River, whose head waters originate on the south slopes of the Fish Lake mountains, located in the southeast portion of Sevier County. The river then flows southeast through Fremont, Loa, Teasdale, then east to Hanksville, making a junction with the Muddy River approximately two miles northeast of Hanksville.

The principal tributaries to the Fremont River from north to South are Road, Pine, Pleasant, Sand, and Sweet Water Creeks. Approximately 15,000 acres are irrigated in Wayne County, of which an estimated 8,500 acres has a full supply. Supplemental water requirements in this area are estimated at 6,600 acre-feet.

The major storage serves the Fremont Irrigation Company. The principal reservoirs are Forsyth, Johnson, and Fish Lake reservoirs, having a combined capacity of 11,700 acre-feet. A number of small reservoirs serving smaller users, have a combined capacity of an estimated 1,850 acre-feet.

Proposed Reservoir Projects

Five reservoir projects are outlined for development of the water resources in Wayne County. The proposed storage would supply 5,500 acre-feet for supplemental requirements, and 3,000 acre-feet to be applied to new lands, making possible the irrigation of 6,500 acres of cultivated land, lacking a full supply, and 1,000 acres of irrigable lands, requiring a full supply.

The State and the Bureau of Reclamation's estimates of the Fremont Project are outlined separately, and three alternate sites for storage benefiting the Torrey area are given; one, which has been surveyed by the Bureau of Reclamation, and two, proposed for investigation by the local water users. More complete investigations will be required to decide on the most feasible site for storage.

Road Creek Reservoir Project.- The Road Creek Irrigation Company proposed to impound 577 acre-feet of water, from Road Creek, located near Loa. This project would provide supplemental water to approximately 500 acres of inadequately irrigated land, and a full supply to 100 acres of new land in the vicinity of Road Creek and Loa.

Approximately 200 people would benefit from this project. Preliminary surveys have been completed by the State Engineer's office, and the Bureau of Reclamation, with an estimated construction cost of \$34,300.

Mill Meadow Reservoir Project.- The Fremont Irrigation Company proposes to impound 5,322 acre-feet of water from the Fremont River. The reservoir site is located approximately three miles northeast of Fremont. The project would provide supplemental water to 4,000 acres of inadequately irrigated land, and a full supply to 900 acres of new land, located in the vicinity of Fremont, Loa, Lyman, and Bicknell.

There are about 500 people that would benefit from this project. Preliminary surveys have been completed by the State Engineer, and the Bureau of Reclamation, with an estimated construction cost of \$324,700.

Teasdale Reservoir Projects.- The Teasdale Irrigation Company proposes to complete construction of three reservoirs to impound an estimated 500 acre-feet, supplied by the waters from Donkey, Birch, and Boulder Creeks.

This project will provide supplemental water to 500 acres of inadequately irrigated land in the vicinity of Teasdale, and would benefit approximately 300 people. It is estimated that \$15,000 is required to complete this project.

Forsyth Dam Repair and Enlargement.- The Fremont Irrigation Company proposes to repair existing leaks in the dam and to enlarge the present reservoir capacity. Preliminary investigations have been made by the Soil Conservation Service. The extent of enlargement and estimated construction costs have not been made.

(Aldrich) Keel Reservoir Project.- The Torrey and Gainesville Irrigation Companies propose to construct a reservoir to impound 2,000 acre-feet of water on the Fremont River. The project would, by exchange, furnish supplemental water to 2,000 acres of inadequately irrigated land in the vicinity of Torrey. The reservoir water would be released to downstream land, in exchange for increased upstream diversions.

There are about 600 people that would benefit from this project. Investigations are in the preliminary stage, and this site is one of three alternates to give the same project benefits. The estimated construction costs have not been made.

U. S. Bureau of Reclamation Projects (1)

Fremont Project.- A supplemental water supply for 9,000 acres of irrigated land and a full supply for 1,000 acres of new land, located in the vicinity of the town of Fremont, Loa, Lyman, and Bicknell, would be provided by a 4,000 acre-foot reservoir on Fremont River or Mill Meadows Site; four miles northeast of Fremont, and a 2,000 acre-foot reservoir on Road Creek, a tributary of Fremont River near Loa.

Torrey Project.- A 2,000 acre-foot reservoir at the Torrey site on Fremont River would, by exchange, furnish supplemental water to 1,200 acres in the vicinity of Torrey, Utah. The reservoir water would be released to downstream lands in exchange for increased upstream diversion to the existing Torrey Canal. Approximately 600 people will benefit from this project. Preliminary surveys were completed by the U. S. Bureau of Reclamation. This project will give approximately the same benefits as the Keel or Aldrich Reservoir Projects.

- - - (1) Bureau of Reclamation, Colorado River Report, P. 146.

Summary

Table 53 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, areas to be furnished full and supplemental supplies of irrigation water.

TABLE 53
PROPOSED RESERVOIR PROJECTS

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost Total	Estimated Acre-foot	Area to be Benefited Acres *
Road Creek	Road Creek	577	34,300	59	500 s 100 n
Mill Meadow	Fremont River	5,332	324,700	60	900 n 4,000 s
Teasdale	Birch Creek Boulder Creek	500	15,000	30	500 s
Forsythe Enlargement and Repair	Fremont River		Investigation Required		
Keel (Alternate)or Aldrich)	Fremont River	2,000			Investigation Required 1,500 s
	TOTAL	<u>8,409</u>	<u>\$374,000</u>		<u>6,500 s</u> <u>1,000 n</u>

U. S. Bureau of Reclamation Projects

Fremont Project -	Same as #1 and #2 above - result of U. S. B.R. study.				
a. Road Creek	Road Creek	2,000			1,000 n
b. Mill Meadow	Fremont River	4,000			9,000 s
Torrey Project	(Alternate site and plan to the Keel or Aldrich Reservoir Sites)				
Torrey	Fremont River	2,000			1,200 s
	TOTAL	<u>8,000</u>			<u>10,200 s</u> <u>1,000 n</u>

* s - Supplemental supply to inadequately irrigated lands.
n - Full supply to new lands

Diversion and Conveyance Needs

There are seven irrigation companies in Wayne County serving approximately 15,000 acres of irrigated land. The distribution systems constructed to serve this area are estimated at 61 miles of main canals with an average intake capacity of 18 c.f.s., and 6 miles of laterals over 4 c.f.s., with an

average intake capacity of 18 c.f.s.

Results of the past survey of diversion and conveyance needs in Wayne County show that three irrigation companies have proposed needed diversion and conveyance projects. Principally, the projects consist of canal realignment and repair; also, replacement or repair of faulty flumes conveying water on the main distribution systems.

The first project investigated and approved for construction in this county was the Hanksville Diversion Project. The principal features are:

- (1) Reinforcing and building up the main diversion dam diverting water from Fremont River.
- (2) River revetments to protect the canal from floods and undermining the adjacent canal section.
- (3) Bentoniting 500 feet of the main canal to reduce excessive seepage losses.

This project will protect the present diversion facilities, thus benefiting 650 acres of irrigated land and approximately 150 people living in the vicinity of Hanksville, with an estimated construction cost of \$11,000.

Summary

Table 54 summarizes the proposed diversion and conveyance needs in Wayne County, showing the name of the irrigation company, source of supply, proposed project, estimated construction cost, and areas to be benefited.

TABLE 54
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS AND REPLACEMENTS

Name of Irrigation Company	Source of supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Gainesville	Fremont River	300 ft.- flume) overshots) 6-slucice gates)	8,000	Prel.	6,000
Hanksville	Fremont River	1-diversion dam) repair) 500 ft.-canal) lining) revetment)	11,000 ^(*)	Complete	650

TABLE 54. PROPOSED DIVERSION AND CONVEYANCE NEEDS - (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres.
Hanksville Canal (Continued)	Fremont River	2.0 miles-canal)	7,500 ^(**)	Prel. Est.	
		lining)			
		1.0 mile-canal)			
		realignment)			
		5.0 miles-canal)			
		enlargement)			
		300 ft.-flume)			
		22-control)			
		structures)			
Torrystown	Fremont River	5.5 miles-canal)	8,700	"	3,000
		lining)			
		4.0 miles canal)			
		realignment)			
TOTAL			34,200		9,650

* - Amount approved for the Hanksville Project.








** - Estimated future needs.

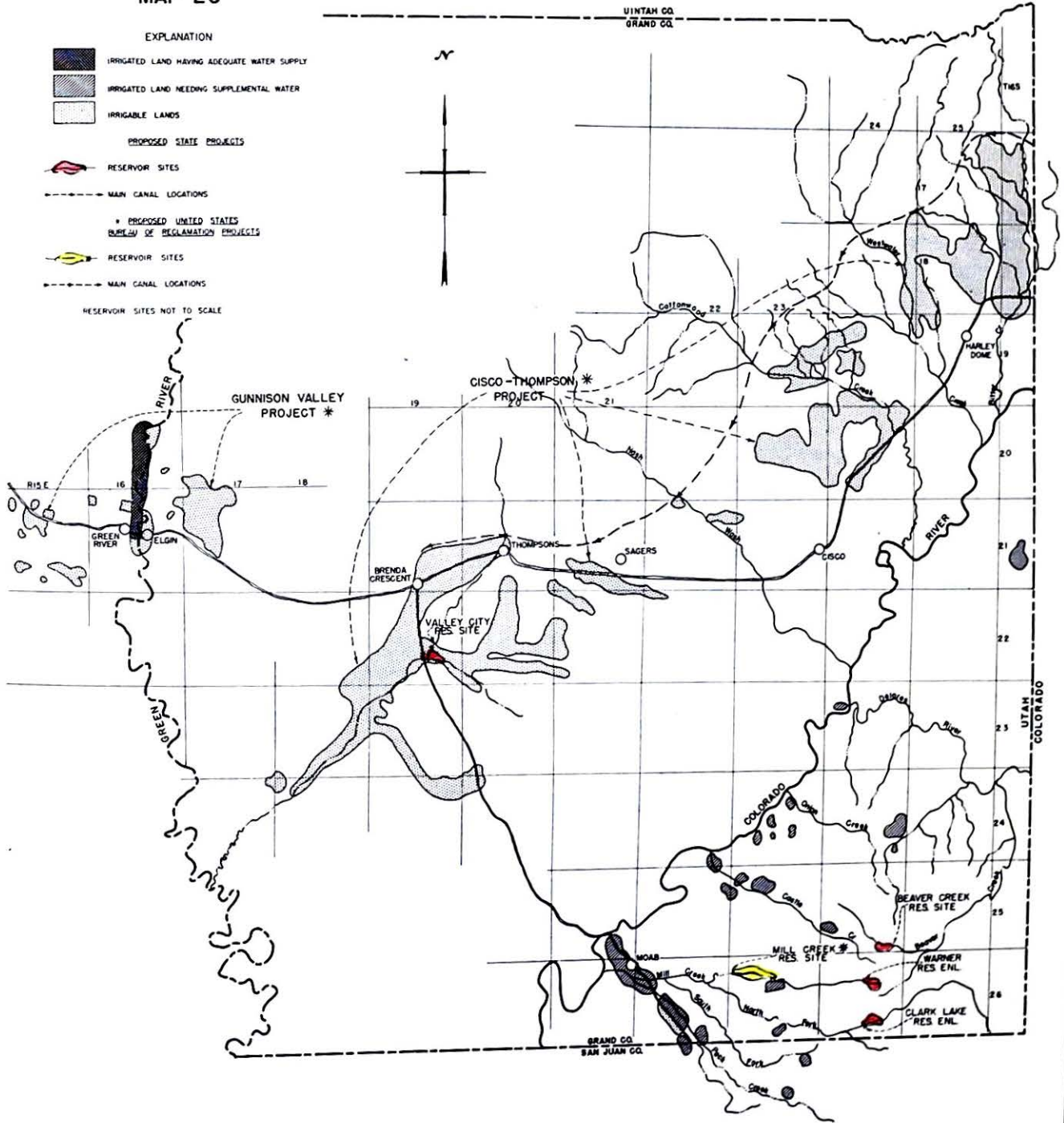
Wayne County Summary

Wayne County's estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	\$374,000
(2) Diversion and Conveyance Projects - -	<u>34,200</u>
TOTAL	<u><u>\$408,200</u></u>


MAP 20

- EXPLANATION
-  IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
 -  IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
 -  IRRIGABLE LANDS
 - PROPOSED STATE PROJECTS
 -  RESERVOIR SITES
 -  MAIN CANAL LOCATIONS
 - * PROPOSED UNITED STATES BUREAU OF RECLAMATION PROJECTS
 -  RESERVOIR SITES
 -  MAIN CANAL LOCATIONS
 - RESERVOIR SITES NOT TO SCALE



PROJECT MAP
GRAND COUNTY
 UTAH WATER AND POWER BOARD

SCALE IN MILES



GRAND COUNTY

Introduction

Grand County lies within the drainage area of the Colorado River and its minor tributaries. The main irrigation is carried on in the vicinity of Moab, utilizing the waters of Mill and Pack Creeks.

The Moab Irrigation Company, which serves approximately 1,900 acres, owns the best water right, but still has a moderate need for supplemental water during average water years. Wilson Mesa, Pack Creek, and Valley City Water Users are all in dire need of a supplemental supply to insure normal production.

The total irrigated area in Grand County amounts to about 4,200 acres, of which none has an adequate supply during average years. The supplemental requirements for this area are estimated at 5,200 acre-feet. There is only one reservoir that is actively used for irrigation and is commonly known as the Erickson Reservoir with a capacity of 65 acre-feet, located on Cottonwood Creek about six miles west of Cottonwood. The Valley City Reservoir, with the original capacity of about 1,700 acre-feet, has for all practical purposes become useless due to the reservoir area filling up with silt.

Potential Irrigable Land

New lands to be brought under irrigation could be developed under the proposed Cisco-Thompson Project supplying 83,500 acres of new land, and the Pack Creek Project supplying 1,200 acres of new land. These projects are under investigation by the Bureau of Reclamation.

Potential new land development in the vicinity of Green River was proposed under the Gunnison Valley Pumping Project by the Bureau of Reclamation, which would benefit 10,830 acres of new land. Of this total, 3,800 acres are located west of the Green River in Emery County.

Proposed Reservoir Projects

Six potential projects are outlined for the development of water resources in Grand County; four projects being proposed by the Grand County Water Users, and two having been submitted by the Bureau of Reclamation in the proposed ultimate development of the Colorado River Basin.

The irrigation of an estimated 370 acres of cultivated land lacking a full supply, and 500 acres of dry arable land would be possible under the proposed State Projects.

Potential projects reported by the Bureau of Reclamation would make possible the irrigation of 1,200 acres of cultivated land lacking a full supply, and 88,200 acres of dry arable land.*

* All but 3,500 acres are in Utah.

Warner Reservoir Project.- The Wilson Mesa Irrigation Company proposes to increase the storage of an over-night reservoir from six acre-feet to approximately 50 acre-feet capacity from the Mill Creek Waters. The reservoir site is

located offstream on the Wilson Mesa. This project would furnish supplemental water to 100 acres of inadequately irrigated land in the vicinity of Wilson. There are three families that would benefit from this project. Investigations are in a reconnaissance stage only. The Soil Conservation Service will aid in preliminary engineering. The estimated construction cost is \$5,000.

Clark Lake Reservoir Project.- The Wilson Mesa Irrigation Company and local sportsmen propose to increase the capacity of Clark Lake from an estimated 5 acre-foot capacity to 51 acre-feet. The lower part of the reservoir can be used for propagating fish life. This project will furnish supplemental water to approximately 70 acres of inadequately irrigated land on Wilson Mesa. There are three families that would benefit directly from this project. Preliminary surveys and cost estimates were made by the State Engineer. The estimated construction cost is \$21,000.

Valley City Reservoir Project (Frank Paxton Dam).- The Valley City Water Users propose a reservoir of 1,400 acre-feet capacity using the flood waters from Thompson-Crescent and Yellow Cat Washes. The site is located just below the present Valley City Reservoir. This project will furnish a new supply to arable lands, located below the reservoir site. Preliminary surveys were reported by the Utah Emergency Relief Administration. The estimated construction cost is \$24,000.

Beaver Creek Reservoir Project.- The water users on Beaver Creek propose a reservoir of 98 acre-feet capacity at a site on Beaver Creek. The project would provide a supplemental supply to 200 acres of inadequately irrigated land lying northeast of Moab. There are two families that would benefit directly from this project. Preliminary surveys and cost estimates have been made by the State Engineer's office with an estimated construction cost of \$28,000.

U. S. Bureau of Reclamation Projects (1)

(1) Bureau of Reclamation, Colorado River Report, p. 131, 135.

Pack Creek Project.- The water users of Moab and vicinity propose a reservoir of 3,000 acre-feet capacity at a site on Mill Creek. Along the lower channel of Mill Creek and continuing up Pack Creek, its tributary, is a 10 mile strip of land which include 3,150 acres of good soil. Of this, there are 1,950 acres mostly in the downstream portion near Moab which are irrigated and require supplemental water during some years. This reservoir site is located upstream from all the land and could store water to supplement existing supplies to the lower portion of the strip and to replace Pack Creek, which could then be used entirely on the upper lands. Also, by driving a tunnel 650 feet through a ridge, Mill Creek flows above the reservoir and could be diverted to augment the water in Pack Creek in irrigating the upper Pack Creek Valley lands.

This project would provide supplemental water to 1,950 acres of inadequately irrigated lands, and a full supply to 1,200 acres of new lands. Approximately 1,000 people would benefit from this project. The Bureau of Reclamation and the State Engineer has made preliminary surveys and cost estimates. The estimated construction cost is \$775,000. for all features of the project.

Cisco-Thompson Project.- The purposes of this project are power, irrigation, flood control, hold over storage, and silt retention. Scattered tracts of undeveloped arable lands extend from Thompson, Utah, north-eastward across

Grand County into Colorado, containing about 87,000 acres of which all but 3,500 acres are in Utah are situated below elevation 4,975 feet.

A gravity diversion canal, 190 miles in length, from the Colorado River is proposed; also, a replacement storage reservoir at the White Water site, six miles above the mouth of the Gunnison River.

Summary

Table 55 summarizes the proposed reservoir projects, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

Diversion and Conveyance Needs

There are seven irrigation companies in Grand County serving approximately 4,200 acres of irrigated land. The distribution systems serving this area consist of approximately 5 miles of main canals with an average intake capacity of 20 c.f.s., and 8 miles of laterals over 4 c.f.s. capacity, with an average intake capacity of 8 c.f.s.

Three irrigation companies have proposed needed distribution and conveyance projects. The major need relative to improvement and repair of the existing distribution systems in Grand County is canal lining to prevent excessive seepage losses of available irrigation water, and also to reduce the danger of water logging and seeping the land below leaky canal sections. This need relative to excessive seepage losses lies mostly within the distribution systems serving Moab and vicinity.

Investigations have proved that excessive seepage losses have gradually water logged the land located below existing canals. Certain portions have been lined with gratifying results, not only saving the available water, but also reclaiming land for agriculture, which would gradually become a grazing meadow.

TABLE 55

PROPOSED RESERVOIR PROJECTS IN GRAND COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost \$ Total	Estimated Constr. Cost \$ Acre-foot	Area to be Benefited Acres*
<u>Proposed by Grand County Water Users</u>					
Warner	Mill Creek	50	5,000	100	100 s
Clark Lake	Mill Creek	51	21,100	410	70 s
Valley City	Flood Water	1,400	24,000	17	500 n
Beaver Creek	Beaver Creek	98	28,000	286	200 s
	TOTAL	1,599	78,100	49	370 s 500 n

TABLE 55. PROPOSED RESERVOIR PROJECTS (CONTINUED)

Name of Project	Source of Supply	Proposed Capacity Acre-Feet	Estimated Constr. Cost \$ Total	Estimated Cost \$ Acre-foot	Area to be Benefited Acres*
Proposed by U. S. Bureau of Reclamation					
Pack Creek	Mill Creek	3,000	775,000	287	1,200 n 1,250 s
Cisco-Thompson	Colorado River	---	---		87,000 n**

* Area to be benefited: s - Supplemental supply to presently irrigated lands. n - Full supply to new lands.

** All but 3,500 acres are in Utah

(Diversion and Conveyance Needs, Continued)

A small amount of realignment, cleaning, and enlargement is necessary in certain sections along the canals, and also the replacement or repair of two diversion dams; one which serves the Upper Pack Creek users, and the other serving the Wilson Mesa Water Users. A general replacement of existing control structures such as take out gates, waste ways, and gravel and sand control structures are also needed.

Summary

Table 56 summarizes the proposed projects, showing the name of the irrigation company, its source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 56

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS.

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Moab	Mill Creek	4.0 miles-canal lining canal repairs and alterations 43-control structures	48,700	Prel. Est.	1,825

TABLE 56. PROPOSED DIVERSION AND CONVEYANCE NEEDS (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost\$	Status of Invest.	Area to be Benefited Acres
Upper Pack Creek	Pack Creek	2.8 miles-canal lining 6.0 miles-canal repairs and alterations 1 - diversion dam 2 - measuring devices	27,050	Prel. Est.	300
Wilson Mesa	Mill Creek	0.5 miles-canal lining canal repairs and alterations 1 - diversion dam 3 - control structures	3,750	"	1,500
TOTAL			79,500		3,625

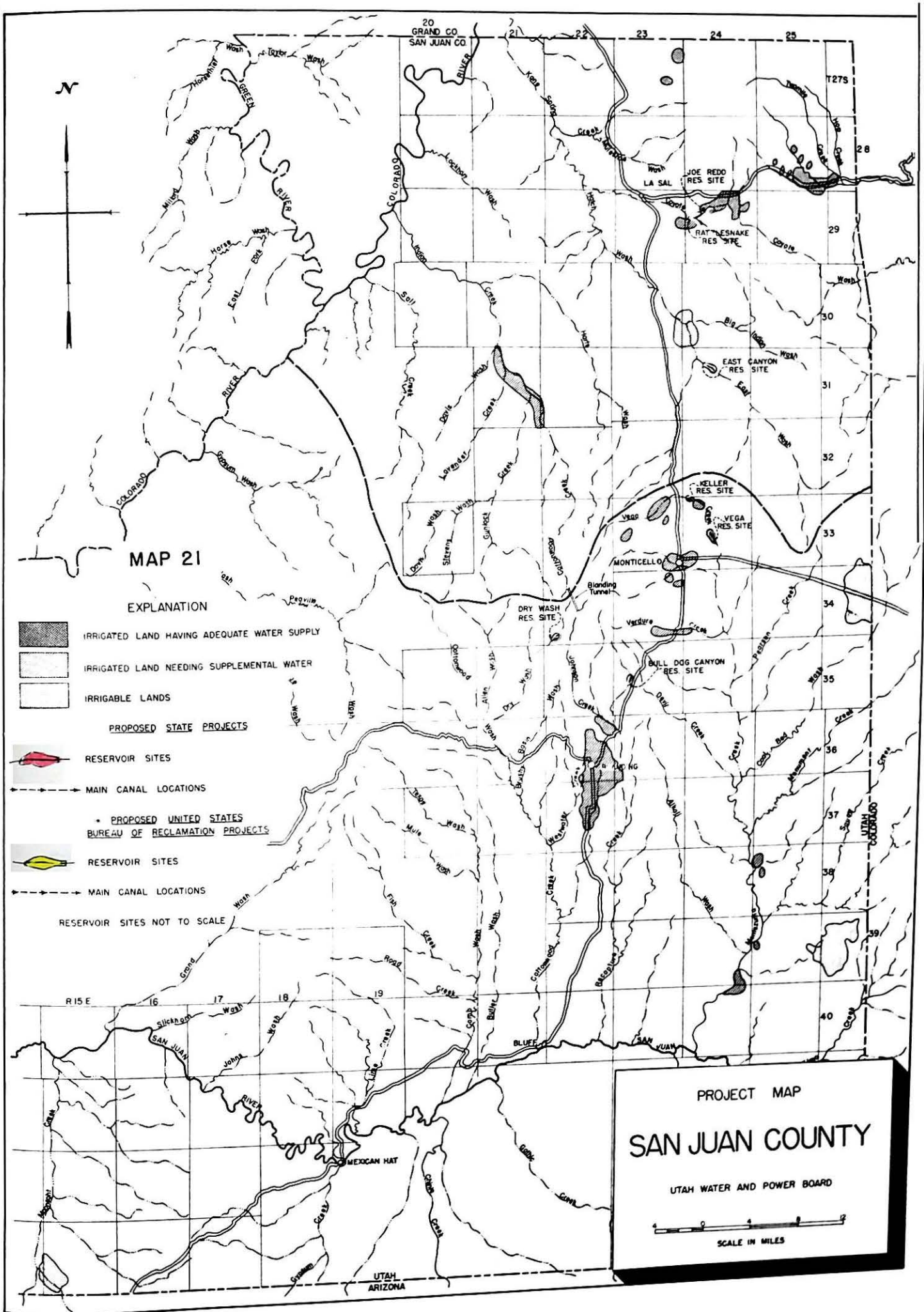
Summary

Grand County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation projects.)

(1) Reservoir Projects - - - - - \$ 78,100




(2) Diversion and Conveyance Projects - - \$ 79,500

TOTAL- - - - - \$157,600




MAP 21

EXPLANATION

-  IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
-  IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
-  IRRIGABLE LANDS


PROPOSED STATE PROJECTS

-  RESERVOIR SITES

-  MAIN CANAL LOCATIONS

PROPOSED UNITED STATES BUREAU OF RECLAMATION PROJECTS

-  RESERVOIR SITES

-  MAIN CANAL LOCATIONS

RESERVOIR SITES NOT TO SCALE

PROJECT MAP
SAN JUAN COUNTY

UTAH WATER AND POWER BOARD



SAN JUAN COUNTY

Introduction

San Juan County is divided into two drainage areas:

(1) Drainage directly into the Colorado River and its minor tributaries, the major streams being the LaSal, Beaver, Two Mile, Cottonwood, South and Chicken Creeks.

(2) Drainage south into the San Juan River, the major streams being the Johnson, Recapture, Montezuma, North and Indian Creeks.

The two drainage areas join together at the junction of San Juan and Colorado Rivers.

The streams originating in the mountains are the only sources of water for present and potential development, and melting snow in the spring provides the major source of run off. Therefore, stream flows decrease rapidly after the spring floods, leaving July, August, and September critically short. The low flow during the critically short period is fully utilized with very minor exceptions, leaving the only source for irrigation expansion dependent upon storage of winter water and spring run off.

Within San Juan County, approximately 12,000 acres are now irrigated, of which, 3,500 acres have an adequate supply during an average water year, leaving 8,500 acres needing a supplemental supply estimated at 13,700 acre-feet.

Serving San Juan County are five reservoirs, with a combined capacity of approximately 2,100 acre-feet, serving lands adjacent to Montezuma, Deep and Vega Creeks.

Potential Irrigable Land Development

The Hatch Creek Project, located on East Canyon and Coyote Creeks, would provide a full supply to an estimated 4,000 acres which is irrigated partially by the natural flow. This project was reported in the Bureau of Reclamation's Colorado River Report, based upon surveys of the reservoir sites, made by the State Engineer's Office.

Proposed Reservoir Projects

Six potential projects are outlined for development of water resources in San Juan County, five projects being proposed by the San Juan County Water Users, and one project listed as a potential by the Bureau of Reclamation.

The proposed reservoir projects would supply approximately 2,490 acre-feet for supplemental water requirements, 11,000 acre-feet to be applied to irrigable lands. Irrigation of 1,550 acres of cultivated land would be possible if projects were found feasible and constructed.

Bull Dog Canyon Reservoir Project.- D. J. Black proposed a reservoir of 162 acre-feet capacity, at a site on Bull Dog Canyon Creek. This project would supply supplemental water to 300 acres of inadequately irrigated land southwest of Monticello. Preliminary engineering has been completed by the Soil Conservation Service, with an estimated construction cost of \$24,000.

Dry Wash Ditch and Reservoir Project.- The Blanding Irrigation Company proposes two small reservoirs with a combined capacity of 150 acre-feet, located on an offstream site and supplied by a feeder canal from Dry Wash. This project would provide supplemental water to 600 acres of inadequately irrigated land in the vicinity of Blanding, and would benefit approximately 300 people. Preliminary surveys have been made by the Soil Conservation Service, with an estimated construction cost of \$23,000.

Joe Redd Reservoir Project.- Water Users on West Coyote Creek propose a reservoir of 79 acre-feet capacity at a site on West Coyote Creek. This project would provide supplemental water to 150 acres of inadequately irrigated land. Preliminary surveys have been made by the Soil Conservation Service, with an estimated construction cost of \$26,000.

Keller Reservoir Project.- Water users on Vega Creek propose to enlarge the existing reservoir from 200 to 500 acre-feet capacity. This reservoir is located on an offstream site, and supplied by a feeder canal from Vega Creek. The proposed capacity would provide supplemental water to an additional 600 acres of inadequately irrigated land in the vicinity of Monticello. Preliminary surveys have been made by the Soil Conservation Service, with an estimated construction cost of \$34,000.

Vega Reservoir Project.- Dalton and Frost propose a reservoir of 1,600 acre-feet capacity at a site on North Creek. This project would provide a supplemental supply to 500 acres of new land located along Vega Creek, southeast of Monticello, approximately 15 miles downstream from the proposed site, and would benefit approximately twelve people. Preliminary surveys and cost estimates have been made by the Soil Conservation Service, with an estimated construction cost of \$56,000.

Proposed Potential Bureau of Reclamation Project. (1)

Hatch Creek Reservoir Project.- LaSal Irrigation Company proposes two reservoirs, one reservoir to be located on Coyote Creek with a capacity of 8,500 acre-feet, and the second to be located on East Canyon Creek with a capacity of 2,500 acre-feet. This project will supplement natural flows for 4,000 acres of land located downstream and adjacent to the channel. Preliminary surveys and estimates have been made by the State Engineer's office, with an estimated construction cost of \$400,000.

- - - (1) Bureau of Reclamation, Colorado River Report, P. 134.

Summary

Table 57 summarizes the proposed reservoirs, showing the name of project, source of supply, proposed capacity, estimated construction cost, and areas to be furnished full and supplemental supplies of irrigation water.

TABLE 57

PROPOSED RESERVOIR PROJECTS

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Estimated Constr. Cost		Area to be Benefited Acres*
			Total	Acre-foot	
Bull Dog Canyon	Bull Dog Canyon Creek	162	24,000	148	300 s
Dry Wash Ditch	Dry Wash	150	23,000	153	600 s
Joe Redd	West Coyote Creek	79	26,000	330	150 s
Keller	Vega Creek	500	34,000	68	500 s
Vega	North Creek Spring Creek	1,600	56,000	35	500 n
TOTAL		2,491	163,000	65	1,550 s

U. S. Bureau of Reclamation Projects

Hatch Creek

(a. Rattlesnake Coyote Creek	8,500)	400,000	400 n
b. East Canyon East Canyon Creek	2,500)		

- * s - Supplemental supply to presently irrigated lands.
n - Full supply to new arable lands.

Diversion and Conveyance Needs

There are eight organized irrigation companies, and an undetermined number of unorganized water users in San Juan County, with an irrigated area of approximately 11,900 acres. The distribution systems consist of an estimated 43 miles of main canals, with an average intake capacity of 26 c.f.s., and 11 miles of laterals over 4 c.f.s., with an average intake capacity of 10 c.f.s.

Results of the survey show that three irrigation companies have proposed needed diversion and conveyance projects. The major distribution and conveyance needs in San Juan County, consist of constructing feeder canals, and a tunnel to increase the available water supply to presently inadequately irrigated lands.

The first project approved by the Utah Water and Power Board in San Juan County was the Blanding Tunnel Project, which consists of completing 3,324 linear feet of tunnel, and a feeder canal to divert surplus waters from Indian Creek through the mountain into the Blanding area. The additional water will benefit approximately 5,000 acres of inadequately irrigated land, and would benefit about 260 families. The

Board approved \$75,000 for this project, and construction was initiated during the summer of 1948.

Summary

Table 58 summarizes the proposed projects, showing the name of the irrigation company, its source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 58
PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

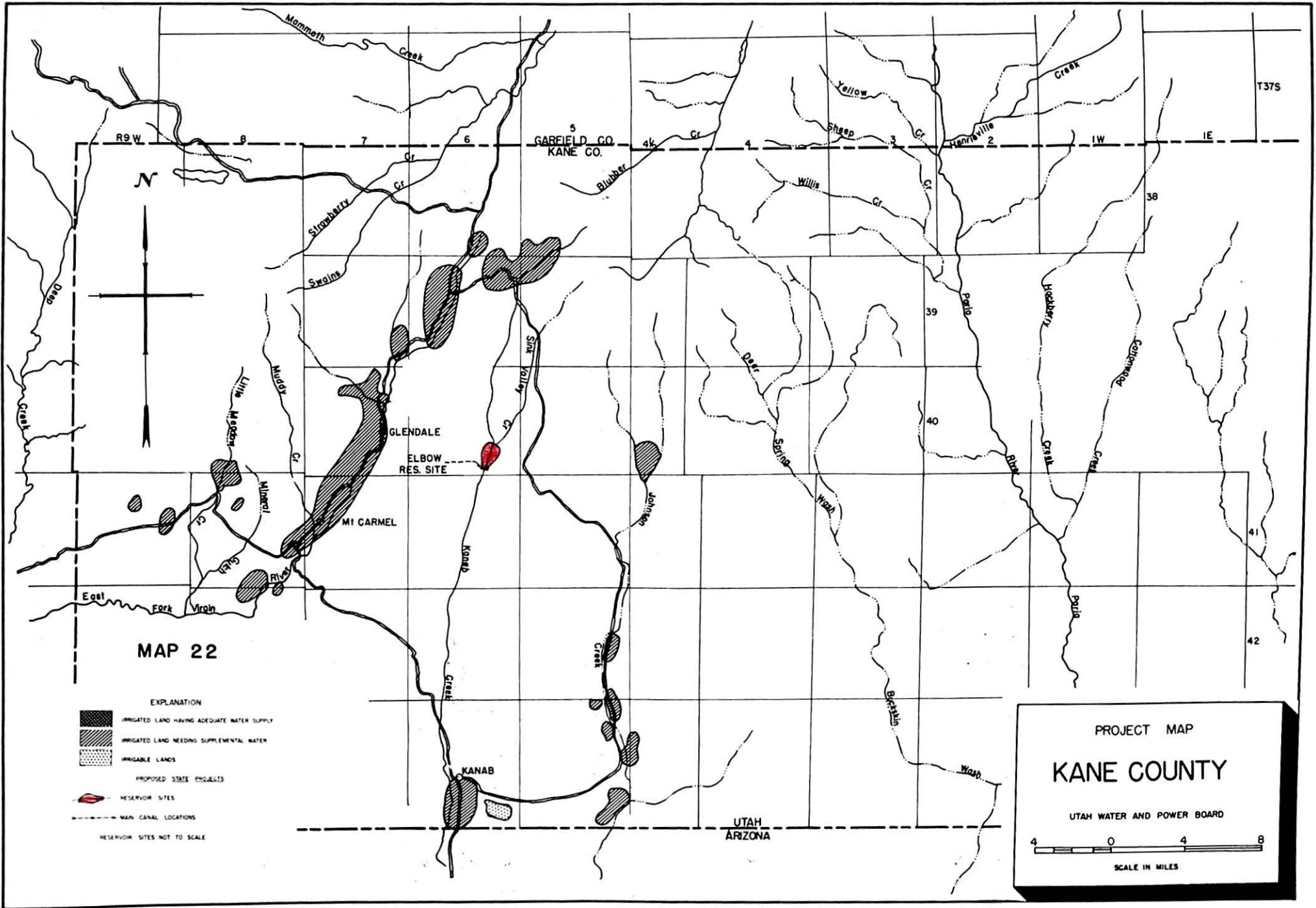
Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Blanding	Johnson and Recapture Creeks	0.63 mile-tunnel feeder canal)	75,000 (*)	Complete	5,240
Blue Mountain	South Creek	3.0 miles-canal lining)	15,000	Prel. Est.	900
Cottonwood Ditch	Cottonwood Creek	6.0 miles-new canal 1-diversion dam)	26,000	"	
TOTAL			116,000		5,940

* - Project approved for construction; \$75,000 allocated towards completion of the project.

San Juan County Summary

San Juan County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects).

(1) Reservoir Projects - - - - -	-\$163,000
(2) Diversion and Conveyance Projects - - - - -	<u>116,000</u>
TOTAL	<u><u>\$279,000</u></u>



MAP 22

EXPLANATION

-  IRRIGATED LAND HAVING ADEQUATE WATER SUPPLY
-  IRRIGATED LAND NEEDING SUPPLEMENTAL WATER
-  IRRIGABLE LANDS
-  PROPOSED STATE PROJECTS
-  RESERVOIR SITES
-  MAIN CANAL LOCATIONS
- RESERVOIR SITES NOT TO SCALE

PROJECT MAP
KANE COUNTY
UTAH WATER AND POWER BOARD

4 0 4 8
SCALE IN MILES

K A N E C O U N T Y

Introduction

Kane County lies within the Colorado River - Minor Tributaries and the Virgin River Drainage Areas. The present development of water resources is outlined under each drainage area.

Colorado River - Minor Tributaries Drainage Area

This area includes the drainage of Kanab Creek on the west, draining the south slopes of the Dixie National Forest in Kane County. Kanab Creek flows in a general southerly direction through Kanab into Arizona. The principal tributary to Kanab Creek is Johnson Creek, which is located approximately ten miles east, and paralleling Kanab Creek, running south through Kane County, forming a junction with Kanab Creek in Arizona.

Moving east, the Paria River drains from north to south with its head waters originating in Garfield County in the Tropic and Cannonville area. This river flows in a southeast direction, ultimately forming a junction with the Colorado River at Lee's Ferry in Arizona.

It is noted that the Paria River Drainage covers a large part of the county where agriculture is not developed extensively, and where the land lends itself mostly to grazing.

The presently irrigated area is approximately 3,900 acres, of which none has a full supply. Supplemental water requirements are estimated at 4,700 acre-feet, which is necessary to stabilize their agricultural economy.

Irrigation in this area has been expanded to its limits of natural free flow, with shortages resulting during the low flow irrigation season. Present storage development is practically negligible.

Virgin River Drainage

This area includes the drainage on the head waters of the east fork of the Virgin River located in the northwest portion of Kane County. The river flows southwest through Glendale, Orderville, and Mt. Carmel, and then flows due west through the southern part of Zion's National Park into Washington County.

The irrigated area amounts to approximately 1,300 acres requiring a supplemental supply estimated at 730 acre-feet. Irrigation in this area has also expanded to its limits of the available natural free flow with shortages resulting during the low flow irrigation season. The major part of the flow during the early irrigation and high spring run off

periods escapes from the area unused. Storage regulation, therefore, is necessary for the maximum utilization of water. Present storage developments in this area is practically negligible.

Proposed Reservoir Projects

One reservoir project is outlined to assist in developing the water resources within Kane County.

Elbow Reservoir Project.- Kanab Creek Water Users propose a reservoir of 5,140 acre-feet capacity at a site on Kanab Creek. This project would provide a supplemental supply to 1,500 acres of inadequately irrigated land, and 500 acres of new irrigable land in the vicinity of Kanab.

Approximately 500 people would benefit from this project. The State Engineer's office, the Bureau of Reclamation, and the Soil Conservation Service have made investigations on this proposed project.

Excessive erosion with possible excessive silting of the reservoir may cause this project to become hazardous, and until the drainage area becomes replanted and controlled grazing is followed religiously, storage on the main streams seem impracticable. The estimated cost of this project is \$210,000.

Summary

Table 59 summarizes the proposed reservoir project in Kane County, showing the name of the reservoir site, source of water supply, proposed capacity, estimated construction cost, and areas to be benefited.

TABLE 59

PROPOSED RESERVOIR PROJECTS IN KANE COUNTY

Name of Project	Source of Supply	Proposed Capacity Acre-feet	Est. Constr. Cost Total	Constr. Ac.-Ft.	Area to be benefited* acres
Elbow	Kanab Creek	5,140	210,000	41	500 n <u>1,500 s</u>
		TOTAL	<u>210,000</u>		1,500 s <u>500 n</u>

* s - Supplemental supply to inadequately irrigated lands.

n - Full supply to new lands.

Diversion and Conveyance Needs

There are seven irrigation companies in Kane County serving approximately 5,200 acres of irrigated land. The distribution systems serving this area consist of approximately 28 miles of main canals with an average intake capacity of 14 c.f.s. No information is available on the extent and capacities of existing laterals.

Seven irrigation companies have proposed needed distribution and conveyance projects. These projects consist mainly of canal lining to stabilize the existing canal sections by reducing erosion, and also reducing excessive seepage losses. Available data regarding the extent of seepage losses from canals in this county are very little. However, due to the small natural flow available during the growing season, efficient conveyance and distribution facilities are necessary, although the initial cost may seem excessive in comparison to the water saved.

Summary

Table 60 summarizes the proposed projects, showing the name of the irrigation company, its source of supply, project description, estimated construction cost, and areas to be benefited.

TABLE 60

PROPOSED DIVERSION AND CONVEYANCE NEEDS
AND ESTIMATED COST OF IMPROVEMENTS OR REPLACEMENTS

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres.
Alton Farmer's	Kanab Creek	5.0 miles-clean- ing and enlarg- ement)	3,500	Prel. Est.	600
Glendale	East Fork Virgin River	80 ft.-flume) 2-diversion) dams) 10-control) structures)	2,800	"	434
Johnson Creek Water Users	Johnson Creek	3 miles-pipe) 400 ft.-concrete) core		Investigation required	200

TABLE 60. PROPOSED DIVERSION AND CONVEYANCE NEEDS - (CONTINUED)

Name of Irrigation Company	Source of Supply	Project Description	Estimated Constr. Cost \$	Status of Invest.	Area to be Benefited Acres
Kanab	Kanab Creek	2 miles-canal) lining) Siphon Replac-) ement)	30,000	Prel. Est.	1,500
Mt. Carmel	East Fork Virgin River	1-diversion) dam) 5 miles canal) lining) 4 Control) structures)	41,400	"	400
Muddy	Muddy Creek	2.5 miles canal) repairs &) alterations)	2,000	"	158
Orderville	East Fork Virgin River	2.5 miles canal) lining)	20,000	"	300
TOTAL			<u>\$99,700.</u>		<u>3,592 Acres</u>

Kane County Summary

Kane County's total estimated cost for the proposed distribution and storage development, (exclusive of major Bureau of Reclamation Projects.)

(1) Reservoir Projects - - - - - \$ 210,000.

(2) Diversion and Conveyance Projects- - - - - 99,700.

TOTAL \$ 309,700.

A P P E N D I X

STATEMENT OF GROUND WATER DEVELOPMENTS
IN THE STATE OF UTAH

In the State of Utah, the amount of water diverted from the ground and its value is increasing each year. Not many years ago the greatest portion of ground water used was that which came from flowing wells. In the past few years new and better pumps, and the gradual decrease in the cost of electrical energy has made it possible to utilize additional ground water for irrigation purposes.

There are a few ground-water areas that may be considered completely developed under the present set of conditions. However, these areas could produce more water if the ground-water levels were lowered. Certain interpretation of the Ground Water law, and the old idea that if a well does not flow there is no water, prevents some areas from being developed to a greater extent.

Immediately after the Ground Water law became effective, March 22, 1935, W. P. A. money was obtained and used to conduct a general state-wide survey. Without this fundamental information it would have been impossible to administer the Ground Water law. This survey has also furnished information absolutely necessary for the few detailed investigations that have been conducted.

The State Engineer's office must keep ahead of the ground-water development in order that such development may be intelligently controlled. It takes a number of years to study in detail each ground-water area. This work can only be done by engineers and geologists, qualified by training and years of experience.

Since the Ground Water law went into effect there has been a steady increase in the demand for ground water. Between July of 1946, and July of 1948, there were filed, in the State Engineer's office, a total of 1711 applications to appropriate ground water and a total of 367 applications to appropriate surface water.

There are many areas in the state where additional ground water may be developed and where detailed investigations must be conducted. Because of the lack of funds in recent years, investigations have not been able to keep pace with the developments and with the need for information.

It is believed that any additional funds appropriated for ground-water investigations will pay rich dividends to the State of Utah in that it will permit controlled development of valuable ground-water resources that would otherwise be undeveloped, or, if developed, without proper control, would lead to endless litigation and hardships among the water users.

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