STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE ENGINEER

For the Period
July 1, 1940, to June 30, 1942, Inclusive

ALFRED MERRITT SMITH
State Engineer of Nevada

CARSON CITY, NEVADA
STATE PRINTING OFFICE - - JOE FARNSWORTH, SUPERINTENDENT
1942

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TYPOGRAPHICAL
UNION
LABEL
WASHOE

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LETTER OF TRANSMITTAL

STATE OF NEVADA,
OFFICE OF STATE ENGINEER,
CARSON CITY, July 31, 1942.

To His Excellency, HONORABLE E. P. CARVILLE, *Governor of Nevada, Carson City, Nevada.*

SIR: In compliance with the provisions of section 14, chapter 140, Nevada Statutes of 1913, and section 1, chapter 171, Nevada Statutes of 1931, I have the honor to transmit herewith the Biennial Report of the State Engineer for the period ending June 30, 1942.

Following your appointment of Deputy State Engineer Hugh A. Shamberger on May 8, 1941, to be Director of the State Council of Defense of Nevada, most of his own time and also a considerable portion of the time of department personnel and use of office facilities have been devoted to the war effort. The performance of this work, in addition to regular duties by the staff, is deserving of high praise. We are proud, and Nevada may well be proud, of the efficiently functioning State organization for civilian defense.

Respectfully Submitted,
ALFRED MERRITT SMITH,
State Engineer.

STATE ENGINEERS SINCE CREATION OF OFFICE

A. E. Chandler	May 29, 1903, to May 1, 1905
Henry Thurtell	May 1, 1905, to May 1, 1907
Frank R. Nicholas	May 1, 1907, to March 3, 1910
Emmet D. Boyle	March 8, 1910, to March 21, 1911
W. M. Kearney	March 21, 1911, to May 15, 1917
J. G. Scrugham	May 16, 1917, to January 10, 1918
Seymour Case	January 25, 1918, to March 28, 1919
J. G. Scrugham	March 28, 1919, to October 7, 1922
Robert A. Allen	October 7, 1922, to March 28, 1927
Geo. W. Malone	March 29, 1927, to May 28, 1935
Alfred Merritt Smith	May 28, 1935—

OFFICIAL ROSTER DEPARTMENT OF STATE ENGINEER

OFFICE PERSONNEL

Carson City, Nevada

July 1, 1940, to June 30, 1942

Alfred Merritt Smith	State Engineer
H. W. Reppert[1]	Assistant Engineer
Hugh A. Shamberger[2]	Assistant Engineer
Edmund Mieth[3]	Deputy State Engineer
F. N. Dondero	Office Engineer
C. E. Thiex	Chief Clerk
Marie Graham Anderson	Stenographer
Reta S. Arkell	Secretary

WATER DISTRIBUTION PERSONNEL

Humboldt River, 1940

J. A. Millar, Supervising Water Commissioner	Entire River
D. E. Winchell, Water Commissioner	Lovelock District
F. E. Backus, Water Commissioner	Winnemucca District
Myron Clark, Water Commissioner	Battle Mountain District
Orvis Stock, Water Commissioner	Lamoille and South Fork Districts
Albert Quill, Water Commissioner	Starr Valley and North Fork Districts
Joe Reynolds, Hydrographer	Willow Creek Reservoir
G. R. Trescartes, Hydrographer	Elko

Humboldt River, 1941

J. A. Millar, Supervising Water Commissioner	Entire River
D. E. Winchell, Water Commissioner	Lovelock District
F. E. Backus, Water Commissioner	Winnemucca District
Myron Clark, Water Commissioner	Battle Mountain District
Orvis Stock, Water Commissioner	Lamoille and South Fork Districts
Edward King, Hydrographer	Elko District
Albert Quill, Water Commissioner	Starr Valley and North Fork Districts
Joe Reynolds, Hydrographer	Willow Creek Reservoir

Humboldt River, 1942

J. A. Millar, Supervising Water Commissioner	Entire River
F. E. Backus, Water Commissioner	Winnemucca District
Myron Clark, Water Commissioner	Battle Mountain District
Edward King, Hydrographer	Elko District
Orvis Stock, Water Commissioner	Elko District
John Franklin, Hydrographer	Lovelock District

Little Humboldt River, 1940

Roland Van Bibber, Water Commissioner	Entire District

Little Humboldt River, 1941

Roland Van Bibber, Water Commissioner	Entire District

[1]Died February 28, 1942.
[2]Appointed Assistant State Engineer March 1, 1942.
[3]Appointed Deputy State Engineer April 1, 1942.

Little Humboldt River, 1942

E. H. GREEN, Water Commissioner.....Entire District
ROLAND VAN BIBBER, Water Commissioner.....Entire District

Currant Creek and Duckwater Creek, 1940

NYE TOGNONI, Water Commissioner.....Entire District
(No Water Distribution for Currant Creek, 1940)

Currant Creek and Duckwater Creek, 1941

NYE TOGNONI, Water Commissioner.....Entire District
(No Water Distribution for Currant Creek, 1941)

Currant Creek and Duckwater Creek, 1942

NYE TOGNONI, Water Commissioner.....Entire District
(No Water Distribution for Currant Creek, 1942)

White River, 1940

MILTON CAMERON, Water Commissioner.....White River

White River, 1941

MILTON CAMERON, Water Commissioner.....White River

White River, 1942

(No Water Commissioner to June 30, 1942)

Muddy River, 1940

DAVE MARSHALL, Water Commissioner.....Entire District

Muddy River, 1941

DAVE MARSHALL, Water Commissioner.....Entire District

Muddy River, 1942

DAVE MARSHALL, Water Commissioner.....Entire District

Pahranagat Lake, 1940

GERALD TRESCARTES, Water Commissioner.....Entire District

Pahranagat Lake, 1941

DONALD K. PERRY, Water Commissioner.....Entire District

Pahranagat Lake, 1942

DONALD K. PERRY, Water Commissioner.....Entire District

SUMMARY OF THE WORK OF THE STATE ENGINEER

STATE COMMISSIONS AND BOARDS

The State Engineer upon taking office automatically becomes a member of the following Commissions:

1. The Nevada Public Service Commission.
2. The Nevada State Board of Irrigation.
3. The Nevada State Irrigation District Bond Commission.
4. The Bureau of Industry, Agriculture and Irrigation.
5. The State Range Commission.
6. The Nevada State Planning Board.

By gubernatorial appointment the present State Engineer is also a member of the following:

7. The Colorado River Commission of Nevada.
8. State Board of Registered Professional Engineers.

RECLAMATION ORGANIZATIONS

1. The Association of Western State Engineers (seventeen Western States).
2. The National Reclamation Association.
3. The "Committee of Fourteen." Two members from each of the Colorado River Basin States, appointed by respective Governors.

STATUS OF ADJUDICATION OF STREAM SYSTEMS

The work of adjudicating the waters of the Nevada stream systems has proceeded since the inception of this office in 1903 to the present time:

1. Stream systems adjudicated, 1903 to date	28
2. Acres under adjudicated streams	384,603
3. Vested water users under adjudicated streams	612
4. Adjudicated stream systems supervised by this office during the past biennium	6
5. Adjudicated stream systems not supervised by this office during the past biennium	22
6. Streams in process of adjudication	27
7. Adjudications completed during past biennium	3
8. Stream systems on which decrees have been entered by civil suit not under supervision of this office	11
9. Stream systems adjudicated by United States District Court	3
10. Stream systems under process of adjudication by United States District Court	2

STATUS OF WATER APPLICATIONS AND PROOFS OF APPROPRIATION

1. Water applications filed, 1903 to June 30, 1942	10,844
2. Water applications acted upon, 1903 to June 30, 1942	10,171
3. Water applications on which no action has been taken	673
4. Water applications acted on, July 1, 1938, to June 30, 1942	503
5. Water applications filed, July 1, 1940, to June 30, 1942	318

6. Proofs of commencement of work filed, July 1, 1940, to June 30, 1942 207
7. Proofs of completion of work filed, July 1, 1940, to June 30, 1942 112
8. Proofs of beneficial use filed, July 1, 1940, to June 30, 1942 118
9. Protests filed against the granting of applications, July 1, 1940, to June 30, 1942 74
10. Certificates of appropriation issued under permitted water rights, July 1, 1940, to June 30, 1942 108
11. Proofs of appropriation filed, 1903, to June 30, 1942 2,319
12. Proofs of appropriation filed, July 1, 1940, to June 30, 1942 16

COOPERATIVE WORK

The State Engineer also carries on cooperative work in the compilation of stream gaging and stream runoff observations through the medium of two State appropriations. The cooperating agencies are:

The Water Resources Branch of the United States Geological Survey.

The Nevada Cooperative Snow Surveys.

The activities of the State Engineer in each of the fields are briefly related under their proper headings elsewhere.

PUBLIC SERVICE COMMISSION

The Nevada Public Service Commission is composed of the following members:

Charles B. Sexton, Chairman, Carson City.
Charles V. Williams, Yerington.
Alfred Merritt Smith, Carson City.
Lee S. Scott, Secretary, Carson City.

The work of this Commission is published by the Chairman in a biennial report. During the past biennium many hearings have been held in various parts of the State on matters concerning the rate schedules of public utilities, rail and motor vehicle carriers, complaints as to public service, and requests for certificates of convenience and necessity for the operation of public utilities.

THE NEVADA STATE BOARD OF IRRIGATION

The board is composed of the following members:

E. P. Carville, Governor of Nevada, Carson City.
Wayne T. McLeod, Surveyor General, Carson City.
Gray Mashburn, Attorney-General, Carson City.
Alfred Merritt Smith, State Engineer, Carson City.

This board was created by the provisions of section 2, chapter 59, Nevada Statutes of 1901 (Nevada Compiled Laws 1929, section 8231), for the purpose of administering an appropriation of $4,000 made by that Legislature, to carry on hydrographic work, irrigation studies, and stream measurements in cooperation with the United States Geological Survey and the United States Department of Agriculture, in association with the Nevada Agricultural Experiment Station. The State appropriation was contingent upon an equal amount of money

being appropriated by the Government. The State Printing Office was authorized to publish additional copies of the Government reports. The board was also authorized to have printed copies of or extracts from any United States report on irrigation or related matters which, in the opinion of the board, would be of value to the people of Nevada.

The activities of the Board of Irrigation were continued by the last Legislature through an appropriation of $1,500 for cooperative work with the United States Geological Survey, Water Resources Branch, and the State Engineer (section 20, chapter 191, 1941 Nevada Stats.). This work, which has been continuously carried on since 1916, is continually adding to the valuable information regarding Nevada's water resources and supply.

THE STATE IRRIGATION DISTRICT BOND COMMISSION

The State Irrigation District Bond Commission was created by an Act of the Legislature approved February 26, 1921, being sections 8217–8228 Nevada Compiled Laws 1929. The Commission consists of the following members:

E. P. Carville, Governor of Nevada.
D. G. LaRue, Bank Examiner.
Alfred Merritt Smith, State Engineer.

It is the duty of the Commission to pass upon the eligibility of bonds of irrigation districts as legal investments within Nevada.

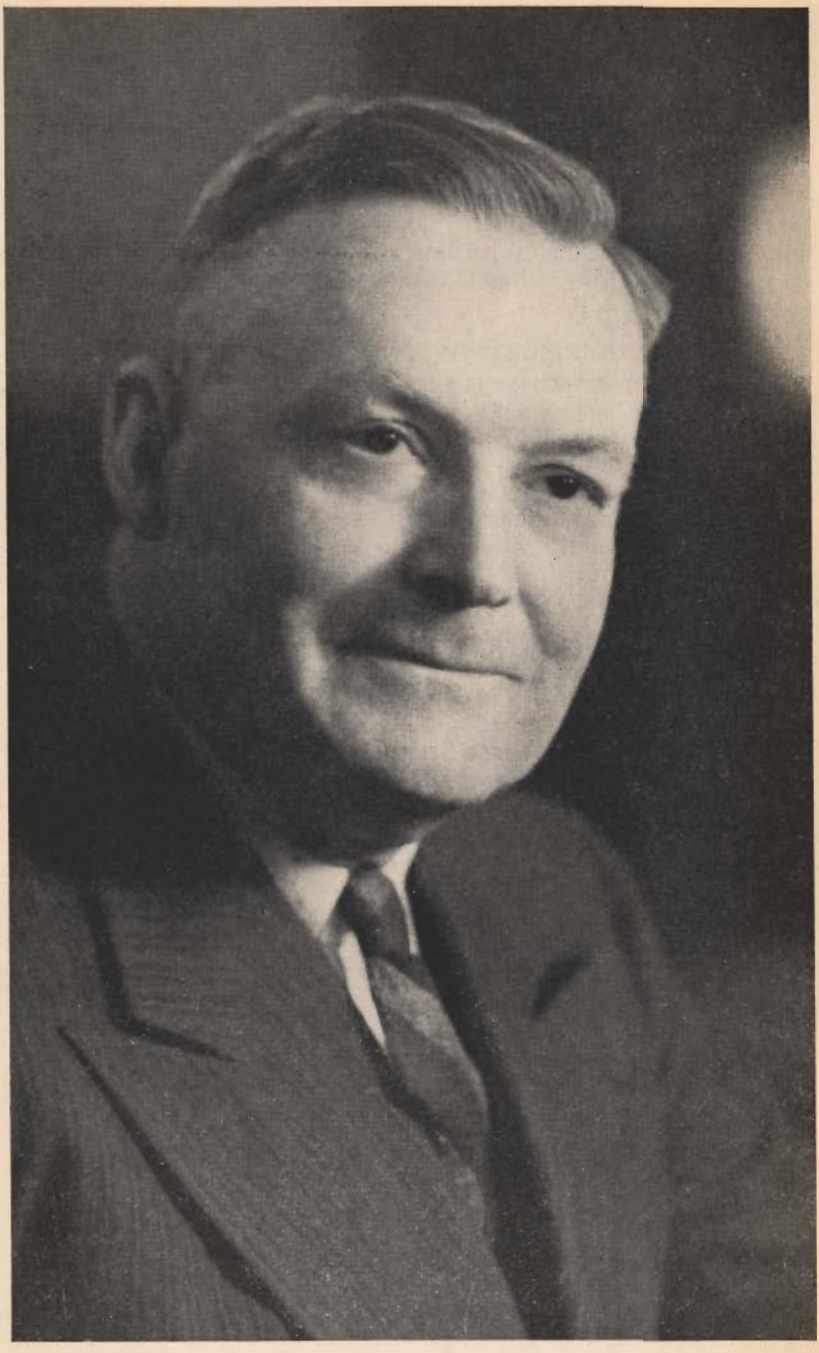
THE STATE RANGE COMMISSION

This Commission consists of the following members:

E. P. Carville, Governor of Nevada.
Charles B. Sexton, Chairman, Public Service Commission.
Alfred Merritt Smith, State Engineer.

The 1929 Legislature created the "State Range Commission" for the purpose of determining the principles, laws, or policies that should apply to the grazing use of the natural range forage resources of publicly owned lands within Nevada.

The work of this commission has been dormant, since the major part of the range area in Nevada has come under the supervision of the Taylor Grazing Division of the Department of the Interior. It should be noted, however, that in the areas not within Division of Grazing Districts the State Engineer bases decisions and makes rulings on water filings according to the Nevada Stockwatering Act of 1925.



HARRY W. REPPERT

1885–1942

Harry W. Reppert

On February 28, 1942, the Department of the State Engineer of Nevada lost by death Assistant State Engineer HARRY W. REPPERT. He had held that position with dignity and honor for sixteen years.

The integrity and ability of Harry Reppert is written into the voluminous records of the office, extending back through the long years. His work for the State of Nevada was more than business to Harry. People from all parts of the State brought their land and water-use problems to him, sure of willing and wise counsel. To work with him was to be his friend. Possessed of unusual engineering qualifications, inherent tolerance, calm good nature, and a buoyant sense of humor, he was never ruffled by the complex problems that came to his desk or confronted him in many journeys afield. His serene spirit and unflagging love for his work and thoughtfulness for his associates was an unfailing source of encouragement, and inspired in us all a desire to do our best work.

With his passing, we have lost an association of great value, a precious friendship, impossible to replace.

ALFRED MERRITT SMITH.

BIENNIAL REPORT OF STATE ENGINEER, 1940-1942

CHAPTER I

Duties and Accomplishments of the State Engineer

By H. W. Reppert[1]

It has been said that "next to the air he breathes, water is man's greatest necessity," a saying of particular significance here in Nevada where we have but a limited supply of this necessity, and which emphasizes the reason why strict caution be exercised at all times to insure its most economical and greatest beneficial use. It was, therefore, in the interest of the conservation and protection of our State's limited water supply that the office of the State Engineer was created.

To provide a basis for a more complete understanding of the system of priority which prevails in Nevada, it would seem pertinent to give a brief résumé of the two theories or doctrines which have had a profound effect on the evolution and growth of western water law, viz, the doctrine of riparian ownership and the doctrine of prior appropriation. The doctrine of riparian ownership is a product of the English or common law, and means "every proprietor of land on the banks of a natural stream has an equal right to have the waters of the stream continue to flow in its natural course as it is wont to run, undiminished in quantity and unimpaired in quality, except so far as either of these conditions may result from the reasonable use of water for irrigation or other lawful purposes by upper appropriators." The riparian theory is in general use in the humid areas in the middle western and eastern parts of the United States.

The doctrine of appropriation is the outgrowth of a custom of unwritten law or precedent established in the early mining days of the West, and means first in time is first in right, commonly referred to as priority.

Nevada early adopted the appropriative theory, because its supply of water, even with the highest beneficial use, is insufficient to supply its needs, but such adoption did not occur until after earlier court decisions had given recognition to the doctrine of riparian ownership.

However, as early as 1885 the Nevada Supreme Court approved the appropriative theory and has on subsequent occasions emphasized its rejection of the riparian doctrine.

In other words, our courts since 1885 have ruled, and our Legislature has so declared, that there can be no ownership in the corpus of the water within the State of Nevada, but that the right to the use of water only may be acquired, and that beneficial use shall be the basis and the measure of such right.

The legislative Act of 1903 created the office of the State Engineer primarily for the purpose of providing a method for determination and regulation of existing water rights in line with the then modern theory evolved in the western and semiarid States. This Act, which, while providing a method for adjudication of water rights which had

[1]This was the twentieth in Governor Carville's "Know Your Nevada" series, and was presented over Radio Station KOH by the late Harry W. Reppert, for sixteen years Assistant State Engineer and who died on February 28, 1942.

become vested or were then in the process of initiation, neglected to provide a specific method by which future rights could be legally acquired; hence, the twenty-second session of the Legislature passed an amendatory law, approved March 1, 1905, providing the exclusive method of subsequently initiating and perfecting a water right by application to the State Engineer for permission to appropriate and apply water to a beneficial use.

Other amendments to the original Act have been made from time to time to conform with changed conditions and legal precedents, so that today our water law represents the outgrowth of constructive evolution in the water history of the arid West, the worth of which has been proven on numerous occasions by its triumphant emergence from repeated stubborn legal battles.

Under the Nevada water law there are two classes of water rights by appropriation; first, so-called vested rights, initiated in the early days of the State's development before any very definite laws concerning appropriation of water existed, and before the office of the State Engineer had been created; second, application rights under which water is appropriated and beneficially used by virtue of permits granted by the State Engineer upon due application being made to him.

Rights prior to 1905 are thus classed as vested rights, the magnitude and extent of which are determined only by a process of adjudication by the State Engineer as outlined in the present water code, while rights initiated subsequent to 1905 are clear cut and well defined as to magnitude and extent, having been granted upon direct application to the State Engineer.

In general then, the duties of the State Engineer under the water code may be summarized as follows: To make a determination of relative rights to water from streams, involving examination and filing proofs of use of water, field examinations and reports on character of soil and kind of crops cultivated, determination of priorities and duty of water requirements; the order of determination to be filed with a court of jurisdiction and made the basis of a civil action; to issue certificates to appropriators in conformity with the final court decree rendered; to supervise the distribution of water on streams where the relative rights of claimants and appropriators have been determined by statutory adjudication proceedings; to accept, file, and approve applications for permission to appropriate the public waters of the State and issue certificates of appropriation when perfected by beneficial use. His duties also extend by law to Carey Act projects.

The water code also requires the State Engineer to "have such training in hydraulic and general engineering, and such practical skill and experience as shall fit him for the position."

The work of determination of vested rights to the water resources of the State has been in active progress since the creation of the office in 1903. During the period, the State Engineer has initiated proceedings for the determination of the relative rights of claimants and appropriators to the use of water on forty-four separate streams or stream systems. On twenty-seven of these stream systems the proceedings have terminated with the entry of court decrees defining the relative rights of said claimants and appropriators. The aggregate area of adjudicated rights for irrigation purposes on the streams as

evidenced by these court decrees is 382,626 acres. Although the vested rights to the use on most of our major streams have been adjudicated or are in the process of adjudication, there are approximately 400 minor streams in the State where the vested right claims remain undetermined.

Under the procedure outlined by the statutes for the initiation of a water right by direct application to the State Engineer, there have been received, examined, and filed since 1905, 10,482 applications for permission to appropriate the public waters of the State for various beneficial purposes. Over 2,700 of these filings have been perfected by application of water applied for to a beneficial use, with 2,530 final certificates of water right issued. Some conception of the value of some of the projects represented by these filings might be shown by citing that the total estimated costs of construction of proposed projects under 1,263 applications filed between January 1, 1930, and December 31, 1939, a ten-year period, is over six million dollars, while actual expenditures in connection with work performed under approved applications in accordance with verified affidavits filed is in excess of two million, three hundred thousand dollars.

One of the major duties of the State Engineer under the water code is the distribution of water among the water users on stream systems where the relative rights to its use have been determined by court decree in a statutory adjudication proceeding, or where the State Engineer's order of determination in such proceeding has been officially filed with the District Court. Accordingly, distribution work is now maintained through duly appointed water commissioners on the Humboldt River and its tributaries, in Pershing, Humboldt, Lander, Eureka, and Elko Counties; Little Humboldt River and its tributaries in Humboldt and Elko Counties; Duckwater and Currant Creeks in Nye County; White River in White Pine County; Pahranagat Lake and its tributaries in Lincoln County, and Muddy River and its tributaries in Clark County. Special service is also rendered to water users on minor streams in the absence of a regularly employed commissioner.

Under a cooperative working agreement between the State Engineer and the United States geological survey, stream measurement work is maintained on the Humboldt River and its tributaries, Little Humboldt River and its tributaries, Carson River, Walker River, Owyhee River, Salmon Falls River, and Virgin River. The data collected in the cooperative work is published in the annual water supply papers of the United States geological survey, which contains stream flow records for the whole United States. The State Engineer also cooperates in the Nevada snow survey work that is carried on under the direction of Dr. J. E. Church, meteorologist, University of Nevada.

Comparatively recently the soil conservation service was established in the Department of Agriculture for the purpose of further effecting conservation of the Nation's soil and moisture resources. In Nevada moisture conservation, in very large measure, means conservation of irrigation water supplies. This in turn entails the preservation of the watersheds of our streams against erosion, and thus integrates the soil conservation service, the forest service and the grazing service of the Department of the Interior in their efforts in

preserving watershed areas in the interest of the production of the greatest amount of usable irrigation water.

The State Engineer enters into direct cooperation with all these agencies in their efforts to conserve and perpetuate the one resource, irrigation water, upon which rests all agricultural activities in Nevada. In many respects this type of work is comparatively new, and extensive developments, in which the State Engineer's office will take an active part, can be expected in the future.

The underground waters of Nevada, except flood waters, which may hereafter be stored by construction of expensive reservoirs, now form practically our only potential water supply. Obviously, all underground waters have only one original source—rainfall—and any draft on the supply must be made good annually or such supply will be exhausted. As early as 1913 the Nevada statutes recognized the appropriative doctrine as applying to underground waters, but it was not until 1939 that legislation was enacted giving the State Engineer supervisory control over the underground waters of the State. No better need of such legislation can be pointed out than the consequences developing as the result of waste of the artesian waters in the Las Vegas basin. Since 1905 over 300 artesian wells have been drilled in this basin with a measured yield of over 18,000,000 gallons of water per day. In the early days of this development the supply of water to many people appeared inexhaustible. However, in recent years there has been a gradual but pronounced falling off in the artesian head, indicating that the draft from the basin exceeds its replenishment. In 1938 the State Engineer in cooperation with the U. S. G. S., the city of Las Vegas, Clark County and the Las Vegas Land & Water Company, conducted a well leakage survey in this area. As the result of this survey sufficient information was obtained to warrant the conclusion that the combined loss to the basin through uncontrolled flowing wells and underground leakage was over four million gallons of water per day. Subsequent conservation measures carried out by the State Engineer under the provisions of the 1939 Act have brought about an estimated saving per day of over one million gallons of water formerly wasted. The continuance of the program inaugurated should reflect a saving of a goodly portion of the remainder of the water now flowing to waste.

In conclusion, it is to be noted that in addition to the duties herein enumerated the State Engineer is by law made an ex officio member of the Public Service Commission; member of the Bureau of Industry, Agriculture and Irrigation; member of the State Irrigation District Bond Commission; member of the State Range Commission; member of the State Board of Irrigation, and by appointment of the Governor a member of the Colorado River Commission, and chairman of the Nevada State Board of Registered Professional Engineers.

CHAPTER II

Office Engineering and Miscellaneous Office Work

By F. N. Dondero, Office Engineer

Despite the shifting from a peace time era to helping our friendly Nations in their war efforts and finally our entrance in the World War II, the regular routine office work, consisting of examining and filing applications to appropriate water, proofs of appropriation of water, checking and filing maps submitted in support of applications, proofs of appropriation and permits; examining applications for action with respect to their denial or approval; examining filed reports, making rulings, issuing permits and certificates, and checking all affidavits in connection with water filings, has been conducted as heretofore. The volume of this work is evidenced by the list of filings tabulated in this report, which shows a noted increase.

Matters pertaining to the pending adjudication of streams, writing and checking decrees entered on such streams, etc., has had its place in the office work.

In addition to attending to callers relative to water rights, much time was devoted to answering inquiries and advising on water problems.

Many deeds covering transfers of water rights of record, affidavits, protests, and other instruments pertaining to water filings have been checked and filed, and indexed on the records.

Although many inquiries are made on range rights of record in this office, no additional maps have been filed.

Valuable reports and data pertaining to water rights and water resources and their developments have been received and given our careful consideration.

Budgets for water commissioners' services on the various streams have been prepared and sent to the County Clerks for their submission to the County Commissioners for consideration and approval.

Notifications of obligations due under water filings, compiling all data under adjudication proceedings, and the filing with the courts of such data, together with arranging for court hearings on pending adjudications, has been conducted as usual.

Although many important articles and maps on water rights and related data have been received, only a few have been given serial numbers and indexed due to pressure of other work. However, this is done when the time is available for such work.

The clerical department has conducted its usual routine work, accounting for all receipts, fees in connection with water filings, checking and filing statements of receipts and expenditures of this office, water commissioners' accounts and the Colorado River Commission, and in addition the filing of all applications, proofs, documents, and making and maintaining complete indexes thereof.

In addition to the daily correspondence, typing of field and office reports, rulings, permits, decrees, etc., the office stenographic department has been occupied in making copies of water filings, decrees, deeds, and many other documents of record on request from attorneys and others.

CHAPTER III

State Water Right Surveyors of Nevada

Following is a complete list of licensed State Water Right Surveyors authorized to practice before the office of the State Engineer during the past biennium:

NEVADA

Alamo—W. F. Thorne.
Beatty—Chas. G. Walker.
Boulder City—Earl W. Banister.
Caliente—Wayne Cox.
Carson City—Walter G. Reid.
Wayne T. McLeod.
Harry E. MacNelly.
Robert A. Allen.
W. T. Holcomb.
Albert Quill.
Elko—W. H. Settelmeyer.
R. A. Kinne.
Ely—F. W. Millard.
C. R. Townsend.
Neil A. McGill.
Eureka—M. M. Harcourt.
Floyd Sadler.
Fallon—L. W. Crehore.
Hugh M. Wilson.
E. P. Osgood.
J. C. Coniff.
Fernley—W. A. Pray.
Gardnerville—O. L. Hussman.
S. Krummes.
Goldfield—Ed. S. Giles.
Las Vegas—William Clark.
Harlan Brown.
Ralph L. Motz.
Chas. L. Knaus.
Van O. Eastland.
C. F. DeArmond.
Frank D. Rathbun.
Lovelock—Robert S. Leighton.
J. H. Causten.
Manhattan—Arthur E. Smith.
Mina—L. B. Spencer.
Minden—J. A. Millar.
Mountain City—Edward C. Stephens.
Montello—John D. Smith.
James Norman Nelson.
Palisade—W. S. Raine.
Paradise Valley—F. B. Stewart.
Pioche—Frank Walker.
Reno—R. W. Prince.
L. H. Taylor.
C. V. Taylor.
D. H. Updike.
Thos. R. King.
John V. Mueller.
M. A. Pray.
Carl Stoddard.
Harold Layman.
David Mitchell.
William J. Moran.
C. J. Preece.
James B. Wynn.
Rio Tinto—G. R. Beechel.
Round Mountain—J. W. E. Taylor.
Sparks—C. C. Taylor.
Sulphur—J. G. Huntington.
Sprucemont—J. L. Vandiver.
Tonopah—D. S. Johnson.
C. A. Liddell.
Tuscarora—Chester L. Woodward.
John W. King.
Winnemucca—F. R. O'Leary.
H. H. Sheldon.
A. V. Tallman.
Yerington—George Parker.

CALIFORNIA

Alturas—W. J. Archer.
Berkeley—R. E. Tilden, 2829 Benvenue Avenue.
San Francisco—T. L. Phillips, Chief Engineer, W. P. R. R. Co., Mills Bldg.
Sacramento—G. F. Engle, 1857 Forty-fourth Street.
Benton—Joseph Markert.

IDAHO

Twin Falls—Harold Wm. Merritt.

OREGON

Burns—Mott V. Dodge.

UTAH

St. George—Leo A. Snow.
Ogden—Louis H. Boukol, Care Southern Pacific Company.
K. W. Kennedy, 1544 Twenty-seventh Street.
Salt Lake City—Norman Blye, 503 Scott Building.
E. A. Vail, Box 895.

CHAPTER IV

Applications for Water Rights

During the biennial period dating from July 1, 1940, to June 30, 1942, there have been 318 applications filed with this office for permission to appropriate water, as compared to 272 filed during the preceding biennium.

MANNER OF USE COMPARISON

	1940–1942	1938–1940	1936–1938
Irrigation	101	73	47
Mining and milling	75	130	110
Stockwatering	46	40	48
Domestic	21	10	9
Migratory waterfowl refuge	....	....	3
To change point of diversion, manner or place of use	11	9	19
Municipal	8	2	8
Bathing	2	....	2
Gravel and sand washing	....	....	2
Power	6	6	6
Recreational	4	2	6
Fish rearing	....	....	1
Manufacturing	3		
Quasi municipal	37		
Railroad	4		

Definite action has been taken on 503 applications during this biennium. This represents action on 325 applications filed prior to July 1, 1940, and 178 filed during this period.

Pertinent information regarding water applications filed in this office since its creation will be found on page 9. The status of applications filed and certificates issued will be found as follows:

1. Status of applications filed during the biennium 1940–1942, chapter XVIII.

2. Status of applications filed prior to July 1, 1940, upon which action has been taken during the past biennium, chapter XIX.

3. Certificates issued under permits during the past biennium, chapter XX.

CHAPTER V

Adjudication of Water Rights

Section 1, chapter 4, Statutes of 1903, provided a law creating the office of State Engineer and furnished a method for the determination of the relative rights in and to waters already appropriated. Several amendments were subsequently made, with the result that our water law is now admirably adapted to conditions in Nevada, and has been declared constitutional in its entirety by decisions rendered by the Supreme Court of Nevada.

Amendatory Acts were passed during the 1907 and 1909 sessions of the Legislature. In 1913 a new water law was enacted and the old water law in its entirety was repealed. The new law was approved March 22, 1913. Under this Act the water law was greatly broadened, both as to the adjudication procedure on the determination of vested rights and the appropriation of water procedure by application to the State Engineer. Subsequent amendments to the laws relating to the adjudication procedure were enacted in the following sessions of the Legislature, viz, 1915, 1917, 1919, 1921, 1925, 1927, 1931, 1933, and 1937. A brief description of these various amendments may be found in chapter 6 of the 1936–1938 report, wherein a summary of the laws enacted by the Nevada Legislature relating to water and the office of the State Engineer is given. A summary of the statutory procedure to determine the relative rights in and to the waters of a stream system under a claim of vested right may be found in our 1934–1936 Biennial Report, and also in the compiled edition of the water laws of this State published in 1941 by this office, both of which are available upon request.

PROOFS OF APPROPRIATION FILED DURING THE YEARS OF THE PRESENT BIENNIUM

During this period the following proofs of appropriation, which are claims of vested water rights, have been filed for future use in the determination of the relative rights and also to make of record such claims. A condensed statement giving the salient data is herewith given in the order of:

1. Proof serial number.
2. Date filed.
3. Name of claimant.
4. Source of water supply.
5. Location by county.
6. Use claimed.

02304.... 8-29-40....Marion E. Yelland; Taft Creek and Tributaries; White Pine; Irrigation.
02305.... 9-13-40....Mrs. A. L. Kruger; Kalamazoo Creek; White Pine; Irrigation.
02306....12-11-40....R. M. Miller; Warm Springs; Washoe; Irrigation.
02307....12-11-40....R. M. Miller; Big Springs; Washoe; Irrigation.
02308.... 6-12-41....H. F. Dangberg Land & Livestock Company; Big Buffalo Springs; Douglas; Stockwatering.
02309.... 6-12-41....H. F. Dangberg Land & Livestock Company; Little Buffalo Springs; Douglas; Stockwatering.
02310.... 8-11-41....John A. Fuller and Clara Mabel Fuller; Campbell Creek; Washoe; Fish Culture and Domestic.
02311.... 9- 8-41....Chas. Culverwell; Old Culverwell Spring; Lincoln County; Irrigation and Domestic.

02312.... 3-11-42....Charles Keough; Summit Spring; Mineral; Stockwatering.
02313.... 3-11-42....Charles Keough; Corner Spring; Mineral; Stockwatering.
02314.... 3-11-42....Charles Keough; Yellow Spring; Mineral; Stockwatering.
02315.... 3-11-42....Charles Keough; Davis Spring; Mineral; Stockwatering.
02316.... 3-11-42....Charles Keough; Black Jack Spring; Mineral; Stockwatering.
02317.... 3-11-42....Charles Keough; North Foothill Spring; Mineral; Stockwatering.
02318.... 3-11-42....Charles Keough; Tree Spring; Mineral; Stockwatering.
02319.... 3-11-42....Charles Keough; South Foothill Spring; Mineral; Stockwatering.

ADJUDICATIONS COMPLETED

MANSE SPRINGS

The location of Manse Springs and tributaries is in the southerly portion of Nye County about six miles southerly from Pahrump, Nevada, and about twenty-eight miles northeasterly from Shoshone, California. There are two claimants to the waters from this source, one by virtue of vested rights and the other under application to the State Engineer for permission to appropriate this water.

April 14, 1937—Petition filed with State Engineer by water users to initiate proceedings to determine relative rights in and to the waters of Manse Springs and tributaries.

May 17, 1937—Field investigation completed and report filed by the State Engineer in his office.

May 18, 1937—Order filed granting petition to determine relative rights in and to the waters of Manse Springs and tributaries. Copy of order and letter advising claimants that since the claimants had all signed waiver of notices the State Engineer would proceed under section 36b.

May 24, 1937—Abstract of claims prepared by the State Engineer and filed in his office.

June 8, 1937—Order of Determination filed by State Engineer in his office.

June 12, 1937—Order of Determination, together with all original evidence and data as of record in the State Engineer's office, were filed with the Clerk of the Fifth Judicial District Court of the State of Nevada, in and for the County of Nye.

June 15, 1937—Court entered an order setting July 29, 1937, as the date for hearing exceptions. This hearing was postponed and set over from time to time, the last order setting the time for November 5, 1937.

November 5, 1937—Hearing before Hon. William D. Hatton, Judge of the Fifth Judicial District Court of the State of Nevada, in and for the County of Nye. Case submitted pending filing of briefs by respective counsel.

February 24, 1939—Decision entered by Hon. William D. Hatton, Judge of the Fifth Judicial District Court.

March 2, 1939—Motion for new trial made by claimant Eddie Barry.

October 19, 1939—Motion for new trial overruled by Hon. William D. Hatton, Judge of the Fifth Judicial District Court.

November 14, 1939—Findings of Fact and Conclusions of Law filed.

November 28, 1939—Eddie Barry appeals to the Supreme Court of the State of Nevada from the order of the District Court denying objectors motion for a new trial. September 11, 1940, was set for the arguments before the Supreme Court.

Supreme Court Opinion filed December 18, 1940, upholding ruling of District Court.

GLENBROOK CREEK

Glenbrook Creek and its tributaries has its origin in an offshoot range of the Sierra Nevada Mountains skirting the easterly side of Lake Tahoe and forming the divide between the Tahoe drainage basin and the Carson Valley drainage, and flows in a westerly direction into Lake Tahoe. The main portion of the watershed lies within the northeast corner of Township 14 N., Range 18 E., M. D. B. & M.

September 6, 1939—The Glenbrook Company filed a petition with the State Engineer to initiate proceedings for the determination of the relative rights in and to the waters of Glenbrook Creek.

June 1, 1940—Report of field investigation of the stream system was filed in the State Engineer's office.

June 14, 1940—The State Engineer entered an order granting petition and signifying his intention to make proper arrangements to proceed with the determination in question.

February 10, 1941—Abstract of Claims filed in State Engineer's office.

May 2, 1941—Order of Determination filed in State Engineer's office.

May 3, 1941—Order Setting Time for Hearing June 12, 1941.

August 1, 1941—Findings of Fact, Conclusions of Law, and Decree filed.

NORTH LOGAN CREEK

North Logan Creek or Logan Shoals Creek No. 1 has its origin the same as Glenbrook Creek, in an offshoot range of the Sierra Nevada Mountains, and is the next mountain stream south of Glenbrook Creek. It flows in a westerly direction and enters Lake Tahoe near the northern boundary of Section 22, Township 14 N., Range 18 E.

September 6, 1939—Petition filed by the Glenbrook Company to initiate proceedings for the determination of the relative rights in and to the waters of North Logan Creek.

June 10, 1940—Report of field investigation of the stream system filed in the State Engineer's office.

June 14, 1940—Order entered granting petition and signifying intention to make proper arrangements to proceed with the determination in question.

September 4, 1941—Findings of Fact, Conclusions of Law, and Decree filed.

ADJUDICATIONS PENDING

BASSETT CREEK

Bassett Creek is located on the easterly slope of the Shell Creek Range and drains into Spring Valley in and about Township 18 N., Range 66 E., M. D. B. & M. There are two claimants to the waters of this source.

December 16, 1938—B. H. Robinson, through his attorney, W. Howard Gray, filed a petition in the State Engineer's office requesting a determination of the relative rights in and to the waters of Bassett Creek.

December 21, 1938—The report of the investigation of the stream system was filed in the office of the State Engineer.

December 22, 1938—The State Engineer entered an order granting the petition and signifying his intention to make proper arrangements to proceed with the determination in question.

December 23, 1938—The State Engineer entered notice and order for taking proofs.

June 28, 1940—Notice sent by registered mail advising claimants that Proof of Appropriation and supporting maps must be filed on or before July 15, 1940.

August 29, 1940—Abstract of Claims filed in State Engineer's office.

August 21, 1941—Final Order of Determination made and filed in the Office of the State Engineer.

September 25, 1491—Order Setting Time for Hearing, November 17, 1941.

November 12, 1941—Notice of Exceptions to the Final Order of Determination.

April 10, 1942—Affidavit of Compliance with Jurisdictional Requisites.

McFAUL CREEK

McFaul Creek lies in Township 13 N., Range 18 E., M. D. B. & M., and flows westerly and drains into the southerly end of Lake Tahoe. There is only one claimant to the waters of this source, *i. e.* Arthur K. Bourne, and the amount of land claimed to be irrigated under the vested right is approximately 34 acres.

June 19, 1939—Arthur K. Bourne, through his agent, H. M. Payne, filed a petition in the State Engineer's office requesting a determination of the relative rights in and to these waters.

July 6, 1939—The report of the investigation of the stream system was filed in the office of the State Engineer.

July 11, 1939—The State Engineer entered an order granting the petition and signifying his intention to make proper arrangements to proceed with the determination in question.

October 30, 1941—Order of Determination made and filed in the office of the State Engineer.

November 19, 1941—Order Setting Time for Hearing January 5, 1942. Postponed and set for July 7, 1942.

MUNCY CREEK

Muncy Creek and all of its tributaries are located in Township 20 N., Range 66 E., M. D. B. & M., approximately thirty miles distant on an airline in a northeasterly direction from Ely, Nevada, and about 70 miles distant by road. The creek heads in the Shell Creek range of mountains and runs in an easterly direction into Spring Valley.

August 27, 1938—Petition filed with the State Engineer to initiate proceedings for the determination of the relative rights in and to the waters of Muncy Creek.

September 22, 1938—Report of field investigation of the stream system was filed in the State Engineer's office.

June 14, 1940—Order filed by State Engineer granting petition to determine the relative rights in and to the waters of Muncy Creek.

KALAMAZOO CREEK

Kalamazoo Creek and tributaries mainly rise and flow in Township 20 N., Range 66 E., M. D. B. & M., approximately 28 miles distant on

an airline in a northeasterly direction from Ely, and about 67 miles distant by road. The creek heads in the Shell Creek range of mountains and runs in an easterly direction into Spring Valley.

January 4 and 31, 1940—Petitions filed with the State Engineer to initiate proceedings for the determination of the relative rights in and to the waters of Kalamazoo Creek.

December 1, 1939—Report filed in the office of the State Engineer of field investigation of the stream system.

June 14, 1940—The State Engineer entered an order granting petition and signifying his intention to make proper arrangements to proceed with the determination in question.

ADJUDICATIONS BY DEPARTMENT OF STATE ENGINEER

Streams on Which Decrees Have Been Entered Under Civil Suits, Statutory Court Decrees, and Streams Adjudicated by United States District Court

The following table shows the status of all the streams in the State that have been or are the subject of adjudication proceedings, given in the order of:

1. Name of stream system.
2. Location.
3. Date adjudication proceedings initiated.
4. Status toward completion, etc.

Baker and Lehman Creeks (White Pine County)—May 22, 1925; both streams considered as one; Findings of Fact, Conclusions of Law and Decree entered October 1, 1934. Acreage land involved 2,191.7 acres.

Barber Creek (Douglas County)—September 21, 1914; Court Decree entered May 27, 1921. Land involved 235.93 acres.

Bartlett Creek (Humboldt County)—Petition for Determination received December 20, 1929; Proofs of Appropriation voluntarily filed. Proofs submitted for 224.9 acres.

Bassett Creek (White Pine County)—Petition for Determination received December 16, 1938. Hearing on the Order of Determination and Exceptions April 22, 1942.

Battle Creek (Humboldt County)—Petition for Determination received December 20, 1929; report on investigation made May 22, 1930; Proofs of Appropriation voluntarily filed. Land involved approximately 666.80 acres.

Bishop Creek (Elko County)—Included in adjudication of Humboldt River system.

Buena Vista Creek (Pershing County)—Petition for Determination of Relative Rights—May, 1931.

Carrico Creek (Lander County)—July 29, 1927; Court Decree entered November 26, 1929; Certificates issued under Court Decree July 3, 1930. Decreed rights for 351.1 acres.

Carson River (Douglas, Ormsby, Lyon and Churchill Counties)—Petition for Determination received May, 1903; on November 13, 1931, Miss Ada Torreyson was appointed special master in chancery for purpose of taking testimony, the transcript of which to be submitted to the Judge for his final action. From time of appointment of special master, hearings were held off and on in Fallon and Carson City. The taking of testimony was completed during April 1940. Litigants have been given one year within which to file final briefs. March 19, 1941, order made by Court appointing Geo. A. Bartlett as special master in chancery and John V. Mueller assistant special master in chancery to make findings and report to the Court. October 8, 1941, plaintiffs' opening briefs filed. June 30, 1942, an order was entered by Geo. A. Bartlett granting defendants to September 30, 1942, to file their answering briefs.

Chiatovich Creek (Esmeralda County)—1914; Notice and Order for Taking Proofs, June 10, 1915.

Clover Valley Creek (Lincoln County)—November 4, 1919; Preliminary Order

of Determination prepared prior to 1927, but not filed. Land involved approximately 467.23 acres.

Clear Creek (Pershing County)—June 10, 1918; Court decree rendered November 25, 1919, affirming Order of Determination; Certificates issued October 30, 1922, under Court decree. Land with decreed rights 1,933.20 acres.

Clear Creek (Ormsby County and Douglas County)—Decree July 22, 1872, civil suit; Notice and Order of Pendency of Proceeding, February 5, 1914.

Crum and Wilson Creeks (Lander County)—July 14, 1925; Court decree entered May 26, 1928; Certificates issued July 20, 1928, under Court decree. Decreed rights for 614.69 acres.

Currant Creek (Nye County)—1919; Notice for submission of proofs dated May 26, 1919; decree entered April 23, 1921; Certificates issued October 30, 1922, and February 13, 1923, under Court decree. Decreed rights for 600 acres.

Deephole Springs, Clear Creek, Squaw Valley Creek, Lost Creek, Grass Valley Creek, Cottonwood Creek, Red Mountain Creek, and Hot Springs (Washoe County)—1915; To abstract of proofs; Adjudication initiated under provision 88a, chapter 253, Statutes of 1915.

Duck Creek (White Pine County)—Decree entered November 24, 1886, civil suit.

Duckwater Creek (Nye County)—December 1, 1909; The first Court decree was rendered by Hon. M. R. Averill, adjudicating the various rights; June 20, 1910, another decree was entered by the above-mentioned Court. October 6, 1919, a stipulation was entered into by the various water users and endorsed by the Court requesting the State Engineer to make field investigation as to types of structures, etc., required for more economical and satisfactory method of distributing water; investigation completed and report filed April 13, 1921; March 27, 1930, a stipulation was entered into by the various water users which brought to a conclusion the remaining questions involved in the litigation of the waters of this stream. Decreed rights for approximately 4,000 acres.

Eden Creek (Humboldt County)—1915; To abstract of proofs, adjudication initiated under provision 88a, chapter 253, Statutes of 1915.

Edgewood Creek (Douglas County)—Petition for Determination of Relative Rights April 29, 1929. Waiver of notices filed.

Evans Creek and Its Tributaries, Being Hufford, or Jake's Creek, and Warm Springs (Humboldt and Elko Counties)—To abstract of proofs; Adjudication initiated under provision 88a, chapter 253, Statutes of 1915. Lands involved approximately 6,819.49 acres.

Franklin River (Elko County)—October 14, 1927; To investigation of facts and conditions; pending order granting petition.

Genoa Creek (Douglas County)—Decree entered July 23, 1881, civil suit.

Glenbrook Creek (Douglas County)—Petition for Determination received September 6, 1939. Findings of Fact, Conclusions of Law and Decree filed August 1, 1941.

Goose Creek (Elko County)—March 5, 1915; Decree entered March 3, 1923; land involved 995.97 acres.

Humboldt River (Elko, Eureka, Lander, Humboldt, and Pershing Counties)—1913; January 2, 1931; Opinion and Decision of the Court entered and filed; August 23, 1931, Proposed Findings of Fact, Conclusions of Law and Decree filed with the District Court at Winnemucca; December 14–17, 1931, motion for new trials presented and argued; March 18, 1932, decisions on motions for new trial filed; February 5–9, 1934, Hearings before the Hon. H. W. Edwards, presiding District Judge at Winnemucca, Nevada, on new trials. Amended, changed and corrected Findings of Fact, Conclusions of Law and Decree by H. W. Edwards, Judge Presiding, filed, with Clerk of Court on December 26, 1934. Proposed Findings of Fact, Conclusions of Law and Decree by H. W. Edwards, Presiding Judge, entered October 7, 1935, filed with Clerk of Court October 8, 1935. Aggregate area with decreed water rights entire stream system:

Harvest crops	174,708.15 acres
Meadow pasture	32,342.61 acres
Diversified pasture	78,962.76 acres
Total	286,013.52 acres

Hall Creek (Tributary to Carrico Creek)—See Carrico Creek.
Iowa Creek (Tributary to Carrico Creek)—See Carrico Creek.
Indian or Chiatovich Creek (Esmeralda County)—1914; Notice and order for taking proofs, June 10, 1915.
Indian Springs Creek (Humboldt County)—Petition for Determination of Relative Rights, December 20, 1929.
Job's Canyon Creek (Douglas County)—Included in Barber Creek Decree, May 27, 1921.
Kalamazoo Creek (White Pine County)—Petition for Determination received January 4 and 31, 1940. On June 14, 1940, the State Engineer entered an order granting petition.
K. C. Creek, Sometimes Known as Conway Creek or Renshaw Creek (Clover Valley, Elko County)—July 1, 1927; Notice and order for taking proofs, November 27, 1928; suit filed in District Court requesting the Court to restrain State Engineer from proceeding with adjudication; Court dissolved injunction and dismissed restraining order; July 10, 1930, amended complaint filed requesting restraining order; no action to date by Court on amended restraining order.
King's Canyon and Gregory Canyon Creeks (Ormsby County)—Decree November 14, 1885, civil suit.
Lehman Creek (White Pine County)—See Baker and Lehman Creeks.
Little Humboldt River (Humboldt and Elko Counties)—1910; opinion and decision entered May 4, 1934. Decreed rights for 46,275.58 acres.
Long Spring (White Pine County)—1915; to abstract of proofs; adjudication initiated under provision 88a, chapter 253, Statutes of 1915.
Luther (Fairview Creek) (Douglas County)—Decree entered May 27, 1874, civil suit.
Manse Springs (Nye County)—Petition for Determination received April 14, 1937. Findings of Fact and Conclusions of Law filed November 14, 1937. Appeal to Supreme Court filed November 22, 1939. Supreme Court ruling affirms ruling of District Court. Opinion filed December 18, 1940.
Muddy River (Clark County)—1905; Decree entered March 12, 1920; certificates issued April 22, 1926, under Court decree.
Muncy Creek (White Pine County)—Petition for Determination received August 27, 1938. On June 14, 1940, State Engineer entered an Order granting petition.
McFaul Creek (Douglas County)—Petition for Determination received June 19, 1939. Hearing of Exceptions to Order of Determination set for July 7, 1942.
McNett or Indian Creek (Esmeralda County)—1915; Notice and order for taking proofs, June 10, 1915; to filing of proofs.
Nigger Creek (White Pine County)—Civil suit.
North and South Springs (Nye County)—February 20, 1937; Decree entered February 21, 1938. Decreed rights for 437.9 acres.
North Logan Creek (Douglas County)—Petition for Determination received September 6, 1939.
Overland Creek (Elko County)—October 16, 1919; Court decree filed October 5, 1925; certificates issued December 31, 1926, under Court decree. Decreed rights for 1,718.82 acres.
Owyhee River (Elko County)—January 28, 1924; On November 21, 1939, Judge F. H. Norcross entered an order denying plaintiff's motion to set for trial and granting motion of defendants to dismiss without prejudice to the institution of a new case.
Pahranagat Lake (Lincoln County)—November, 1919; Court decree entered October 4, 1929; certificates issued on November 1, 1929, under Court decree. Decreed rights for 4,971.62 acres.
Pass, Big and Boyd Basin Creeks (Humboldt County)—Decree July 1, 1935, civil suit, United States District Court.
Panaca Big Springs (Lincoln County)—Petition for determination of relative rights filed July 27, 1928.
Peavine Creek (Nye County)—June 2, 1928; Hearing of exceptions to the order of determination by Court, May 20, 1934. Lands involved, 209.33 acres.
Piute Creek (Humboldt County)—December 20, 1929; To order granting peti-

tion to determine relative rights, dated May 9, 1930. Proofs submitted, 541 acres.

Quinn River (Humboldt County)—Civil suit decree, Pacific Livestock Company v. Ellison Ranching Company and others, entered April 9, 1919; a petition for an alternative writ of mandate was filed in the Supreme Court on August 12, 1930, requesting the State Engineer to assume and take control and to regulate the waters of Quinn River; the Supreme Court on July 2, 1931, handed down a decision which failed to sustain the alternative writ and dismissed the proceedings. Decreed rights for 17,411.34 acres.

Reese River (Nye and Lander Counties)—1910; To notice of pendency of proceedings.

Rice Creek (Elko County)—1910; Court decree entered June 20, 1922; decreed rights for 833.73 acres.

Robison Creek (Esmeralda County)—1915; To abstract of proofs; adjudication initiated under provision 88a, chapter 253, Statutes of 1915.

Salmon River (Elko County)—March 5, 1915; District Court decree entered March 1, 1923; a separate decree was entered March 23, 1916, in the United States District Court for the District of Idaho, Southern Division, in the matter of Twin Falls Salmon River Land and Water Company v. Vineyard Land and Stock Company; land involved approximately 13,000 acres.

Schell Creek (White Pine County)—September 15, 1934; Decree entered June 18, 1938. Decreed rights for 109.72 acres.

Siegel Creek (White Pine County)—1918; To proofs taken.

Silver Creek (Lander County)—March 17, 1927; Decree entered on February 13, 1925.

Silver Creek (White Pine County)—Decree entered July 6, 1911; civil suit.

Simpson Creek (Eureka County)—1910; To notice of pendency of proceedings.

Six Mile Creek (Elko County)—July 22, 1919; Court decree filed and entered December 12, 1925; certificates issued December 31, 1926, under Court decree. Decreed rights for 417.90 acres.

South Spring (Nye County)—See North and South Springs.

Spanish Creek (Perry Aiken Creek)—1915; Court decree entered on January 22, 1916. Decreed rights for 1,431 acres.

Steele Creek (Elko County)—To notice and order continuing hearings.

Steptoe Creek (White Pine County)—January 12, 1931; Decree entered November 6, 1935. Decreed rights for 1,958.05 acres.

Thousand Springs Creek (Elko County)—March 24, 1928; Court decree entered December 6, 1929; certificates issued April 19, 1930, under Court decree. Decreed rights for 5,419.80 acres.

Tony Creek (Humboldt County)—1925; Court decree entered August 30, 1929. Decreed rights for 29.88 acres.

Trout Creek (Elko County)—1910; To notice pendency of proceedings; tributary to Humboldt River, adjudicated as part of Humboldt River stream system.

Truckee River (Washoe, Lyon and Churchill Counties)—1913; Temporary order issued by United States Court, February 13, 1926. On April 20, 1942, the Truckee River Agreement and a Stipulation for entry of Final Decree was filed.

Virgin River (Clark County)—1921; Court decree entered May 14, 1927. Decreed rights for 1,933.22 acres.

Walker River (Douglas, Lyon and Mineral Counties)—1902; March 3, 1919, final decree; Amended Final Decree of Walker River System was filed on April 25, 1940. On August 7, 1940, Don C. Foster, Superintendent of the Carson Indian Agency, was appointed as a member of the board of water commissioners. This Board, known as the U. S. Water Commissioners, and its members are: Chairman, George Parker, Members F. M. Fulstone, S. H. Hunewill, F. O. Stickney, John H. Wichman, Don C. Foster; C. O. Gelmstead is Secretary.

Weaver Creek (White Pine County)—Decree entered May 12, 1894; civil suit.

Weeks (Steel) Creek (Elko County)—1915; To notice of inspection served on claimants. Refer to K. C. Creek.

White River (White Pine and Nye Counties)—Certificates issued by State Engineer under sections 14 to 19, inclusive, of Statutes 1907, in 1912; Decem-

ber 4, 1922, case reopened under Statutes 1913; order of determination filed with Court October 7, 1922; hearing on exceptions held December 4, 1922; decree entered nunc pro tunc as of December 4, 1922, by Hon. H W. Edwards, District Judge, Seventh Judicial District Court of Nevada, in and for the County of White Pine. Decreed rights for 3,951.10 acres.

Woods Gulch (Elko County)—Petition for determination of relative rights filed. Stipulation entered into December 27, 1929. Petition withdrawn January. 1930.

CHAPTER VI

Common Methods of Measuring Water as Practiced in Western States

The booklet entitled "Common Methods Of Measuring Water As Practiced In Western States" which was prepared by the Office of the State Engineer in the year 1940 has proven to be a valuable aid to ranchers, miners, stockmen, and water engineers, not only in the United States, but in many foreign countries. This booklet was prepared mainly for the purpose of describing the measurement of water through the various types of weirs, orifices, and the Parshall Flume in a simple manner that could be understood by the layman. Drawings are included of the various types of weirs and orifices, together with seven discharge tables which cover all of the various types of measuring devices that would be used under ordinary conditions.

The demand for these pamphlets has been rather heavy, and over five hundred have been sent out to some thirty States outside of Nevada—Arizona, California, Colorado, Connecticut, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Oklahoma, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, Washington, D. C., and Wyoming. In Nevada over a thousand copies have been distributed to water users. Requests have come from the following countries outside of the United States for copies of this pamphlet: San Salvador, Central America; Mexico City, Mexico; Vancouver, British Columbia; Havana, Cuba; Caracas, Venezuela, South America; Bogota, Colombia, South America; Canada; Manila, Philippine Islands; Opoho, Dunedin, New Zealand; Buenos Aires, Argentina; Brisbane, Queensland, Australia; Hobart, Tasmania, Australia; Wellington, W. I., New Zealand; Pointe-A-Pierre, Trinidad, B. W. I., Honolulu, T. H.

Copies of this bulletin are still available and can be furnished without cost to interested parties.

CHAPTER VII

Civilian Defense

By HUGH A. SHAMBERGER, *Director Nevada State Council of Defense*

Hugh A. Shamberger, Assistant State Engineer, was elected Director of the Nevada State Council of Defense on May 8, 1941. For some months thereafter no funds were available to defray the expenses of the director. During this period the State Engineer supplied clerical help, office space, and traveling expenses. Much traveling is necessary in the performance of work by the Department of the State Engineer, and it has been to some extent economically combined with the extensive traveling that must also be done by the director. The office of the director has been established in the offices of the State Engineer, and Mr. Shamberger performs this service without additional compensation by either the State or the Government.

In this critical time of war a properly developed home front is a vital necessity. Fully realizing this, the members of the staff of the State Engineer have aided Director Shamberger in all ways possible.

Continuous assistance in many ways, through the use of a large personnel, has also been rendered by Robert A. Allen, State Highway Engineer, and the members of his efficient official staff.

A paper entitled "Civilian Defense" was presented by Director Shamberger before Nevada's First Economic Conference, called by Governor E. P. Carville in Reno on May 8, 1942, and is herewith reproduced in full:

On March 28, 1919, an Act creating the State Council of Defense was approved by the Twenty-ninth Session of the Nevada Legislature. You will note that this was after the signing of the armistice. I would like to quote a portion of the preamble to this Act:

> WHEREAS, Said state, county, and community councils of Nevada, cooperating with the national government, proved invaluable agencies during the war period in carrying out government requests, and in the presentation to the people of the war needs and problems of the federal government and its departments in meeting the emergencies of war; and
>
> WHEREAS, It is the manifest duty of Nevada to cooperate with the national government in meeting such conditions and demands as may arise during the readjustment period; and
>
> WHEREAS, The national government, through the council of national defense, has specifically requested the continuance of the state council of defense and its subordinate and auxiliary councils for an indefinite period and ask that the same be legalized by act of the legislature.

This is the statute under which our present State, county, and local councils of defense have been set up. It provides among other things that the members of the State Council of Defense shall not exceed twenty-five; that the State Council of Defense shall have the power to prescribe the powers and duties of all county and community councils, and that all county and community councils shall be organized under and by virtue of authority of the State Council of Defense and shall be under its control and supervision.

It is also provided that the State Council of Defense shall cooperate with all departments of the National, State, and county governments in the promotion of such plans, programs, and policies as may be made necessary by the readjustment period following the war.

If in the wisdom of our 1919 Legislature such a body was essential in the readjustment period following the first world war, it is obvious that such a body will be essential in carrying out the plans now under consideration. Our thousands of volunteers will be trained and ready for that task.

Our present State Council of Defense was organized by Governor Carville on May 8, 1941, one year ago today. While this Economic Conference is primarily for the purpose of post-war planning, my paper will be devoted to the task at hand—to explain just what civilian defense means and to tell you of some of the programs that are now being carried on throughout our State. Also, I believe you will recognize the fact that such a program will have a definite post-war value.

Civilian defense has one main objective—to help win this war. It has two main functions: First, to enlist, organize and train volunteer personnel for the protection of civilian life and property and, second, to mobilize every man, woman, and child in carrying on programs essential to this war effort and seeing to it that everyone is throwing his full weight into this war.

The active defense of our country is the responsibility of our Army, Navy, and Air Force. The passive defense or the protection of civilian life and property in the event of an enemy attack is the responsibility of the civilians themselves. It covers every community, and every man, woman and child in those communities, and must therefore enlist the time, energy, and interest of every patriotic citizen.

Our councils of defense were not formed to make war, but to prepare the defense of the civilian population so that should attack come casualties and property losses will be held to the minimum and hence offset the purpose of enemy air raids on communities, which are usually for the purpose of creating panic and breaking down public morale.

Immediately following May 8, 1941, the State Council of Defense started organizing county and community councils of defense in every county and in practically every community of our State. Work was started on essential programs, volunteers enrolled, protective services organized, and following December 7 very little readjustment had to be made. On that date our councils of defense were ready in every county and community.

At the present time there are sixty county and community councils of defense in Nevada and they are all working, getting stronger every day, and people everywhere are cooperating splendidly. I know, because I have visited them all many times during the past twelve months.

Civilian defense, as I have stated, has two main functions—civilian protection and civilian participation.

Civilian protection is designed for the protection of civilian life and property, to teach the people of Nevada how to save their lives and property from enemy attacks from the air. To this end there have been enlisted over 8,000 volunteer men and women to act as air-raid

wardens, auxiliary firemen and policemen, emergency medical service, emergency utility repair, and public works corps, and other of the protective services, all essential to civilian defense.

Nevada is rapidly becoming a military and defense industry State. Near the southern tip of the State is Boulder Dam which furnishes the main supply of electrical power for the defense industries in southern California. At Boulder City is Camp Siebert, where there are over a thousand soldiers training for military police. Between Las Vegas and Boulder City the great $60,000,000 magnesium plant is now under construction, and the first unit is scheduled to produce strategic magnesium metal within a month or so.

Within a few miles of the magnesium plant a $4,500,000 manganese plant will soon be under construction.

About ten miles north of Las Vegas is Camp McCarran aerial gunnery school with over 4,000 army personnel. Near Tonopah an aerial bombing base is now under construction, and from this base bombers will take off for practice maneuvers on the 3,500,000 acres of aerial gunnery range lying south and east from Tonopah.

Near Hawthorne, a town of about 800 a year ago and now overflowing with some 5,000 people, is one of the larger Navy ammunition depots. An Army munition depot is now under construction near Susanville, just over the Lassen County line in California. The great Lemmon Valley air depot will soon be under construction and probably will be completed some time this fall, and there is talk of a Navy training base near here. Then there will be the contact pilot schools near Austin, Fallon, and Minden, and other military and defense industry activities are bound to follow.

Added to this we have our three transcontinental railroads, our strategic highways, out great copper mines and smelter in White Pine County, the large tungsten mine in Pershing County, the magnesite mine in Gabbs Valley which will furnish ore for the Las Vegas plant, and which is now furnishing ore for the reduction of magnesium at the Permanente plant near San Jose, the lead and zinc mines in Lincoln County, and other strategic mines throughout the State.

I mention these items in order to impress upon you this fact—that if enemy bombers attack continental United States on the west coast, it is highly probable that some of these attacks will be concentrated on strategic points in Nevada. If the enemy fails to find his target or is turned back the bombs will be unloaded on our communities, not so much for destructive purposes but to create panic which is more destructive than the actual bombing. Panic evidences a complete disintegration of the morale of the people. The predisposing cause of panic is complete unpreparedness to meet emergency situations. The correction of such a condition can be brought about only through an organizational set up, such as our protective services.

And so we are preparing here in Nevada with over 8,000 men and women volunteers assigned to these various protective services. Of this number over 3,000 have either completed their minimum training or are now in training. They are devoting a great deal of time to this work and will continue to devote their time and energy for the duration. Our auxiliary firemen are being trained under the supervision of the fire fighting officials in each community, the auxiliary policemen

under the police officers. The air raid wardens are operating in close contact with the police departments. The emergency medical services are under the supervision of our doctors and nurses. In every community in our State this work is going on. I wish I could tell you of some of the things that they are doing so you could appreciate more fully the time and energy that is being put forth.

Uniform blackout ordinances have been adopted in nearly all of the counties and incorporated cities in the State. Most of the communities in the State have had blackout practices and all are equipped with air raid warning devices.

Civilian participation, the other major phase of civilian defense, is the mobilizing of all organizations, associations of people and individual citizens to do effectively and efficiently the things they are best qualified to handle. This may be termed the channeling of the large reserve of volunteers in programs developed to safeguard health, welfare, and morale. Many of these programs are being carried on by existing organizations, and in such cases assistance can be given by the defense councils in referring volunteers to these programs in order that their organization activities can be further developed and stimulated.

Perhaps one of the most vital programs at the moment is the salvage for victory program that is now well under way in Nevada. There have been appointed a State Salvage Committee and an Executive Secretary working under the War Production Board. In each community salvage committees are being formed by the councils of defense. More than 35 of these committees have been set up and are operating with remarkable success. While this program covers the salvaging of scrap metal, rubber, paper, old cloth, and tin cans, at the present time emphasis is being placed on scrap metal and rubber due to the extreme shortage of these two items, and their importance in the production of implements of war. The salvage of tin cans which are being utilized by the Nevada Consolidated Copper Company at Ruth in the precipitation of copper, is also emphasized.

The nutrition program carried on by the State and county nutrition councils in coordination with the councils of defense has made great progress in Nevada. More than 3,000 women have either completed this course or are now taking it. This program has three main points:

1. It translates the result of modern nutrition research into simple, easy-to-follow rules.

2. It has its front line attack in the communities where people live, eat, and make their purchases.

3. It utilizes all available channels of public information to combat the lack of knowledge which is the main cause of malnutrition.

Another important program that has made great progress is home nursing under the supervision of the Red Cross. This covers 24 hours of training in the fundamentals of home nursing, and has been taken by approximately 1,000 women in the past three or four months. Home nursing is essential because there will be a great shortage of doctors and nurses as the war continues, and in the event of an epidemic, such as we had in the last war, women having this training and working under the supervision of doctors and nurses can well serve to relieve what can well be a critical situation.

The victory garden program, under the guidance of victory garden committees of the nutrition council, is making rapid progress and all over Nevada small home gardens are being planted.

Last January tire rationing boards were organized under the councils of defense in practically every community in the State. These boards, now known as rationing boards, under the direction of a State Rationing Administrator, have been doing a magnificent job. Their work has expanded from rationing tires and recaps, to automobiles and now sugar, and soon other commodities will be on the rationing list.

A State Consumer Interest Committee has been set up and soon suggested programs will be handed down to the local councils of defense.

The State Health and Welfare Committee is charged with the responsibility of inventorying all Federal, State, county and local health and welfare organizations and to coordinate their activities in our war effort.

Recreational committees are being set up to plan recreational schedules for the soldiers and defense workers.

In many of our communities volunteer offices have been established with a representative committee in charge, which centralizes all of the local participation activities. Here volunteers fill our their registration cards and are interviewed, and as soon as possible assigned to a program for which their qualifications best suit them. We hope to have such offices in all of our communities.

Realizing the danger of range and forest fires, the councils of defense, in cooperation with the Forest Service, Grazing Service, Indian Service, Extension Service, county fire coordinators, representatives from the Highway Department, and others, are organizing rural fire boards in order that all fire fighting equipment and personnel may be coordinated. We believe this important due to the threat of sabotage—and when we talk of sabotage we usually mean fire—and also the fact that one enemy bomber loaded with phosphorus leaflets could set fire to the entire northern portion of our State. In addition to this a strong effort has been made through our State and county fire coordinators to have communities strengthen their fire departments. In some localities there is no fire equipment whatever, and in others such equipment is inadequate. This condition should be corrected.

Since there is constant danger of enemy attack on our coastal areas there is always the possibility of a sudden and uncontrolled evacuation of people from those areas into our State. This not only represents a major traffic problem, but problems in sanitation, health, welfare, emergency housing, feeding and clothing. With this in mind Governor Carville has appointed an evacuation coordinator under the State Council of Defense who will have the responsibility of coordinating all services essential for the proper handling of such a movement. This will include the health and welfare services, the Red Cross, which will have the job of emergency clothing, feeding, and housing, law enforcement, highway problems, and other essential services. This work is progressing rapidly. I might state that the Army does not plan evacuation of civilians this far back at present, but there is the danger of a sudden and panicky movement. In addition to these, many other programs are being developed for community participation.

The Red Cross with its thousands of volunteer workers plays a most vital role in our war program, and fortunately our Red Cross chapters throughout the State are functioning in splendid manner and are rapidly building to full war strength.

I must not conclude this paper without telling you about the part the Office of Civilian Defense has in our national war effort. The Office of Civilian Defense was created by Executive Order of the President on May 20, 1941. It has a three-fold purpose: First, the organization of all civilian agencies of defense; second, the coordination of the efforts of the city, State and Federal governments; and third, the direction of all activities so that there may be complete and total mobilization. Here in Nevada we are in the Ninth Region of Civilian Defense, together with Montana, Idaho, Utah, Arizona, California, Oregon, and Washington. Regional headquarters for the area is in San Francisco. The O. C. D. acts in advisory capacity to the States, and the State Council of Defense is the liaison between the O. C. D. and the local councils of defense.

Our protective services and participation activities have been developed according to standards handed down by the O. C. D. and we are working in complete harmony. There are over 9,000 councils of defense in our forty-eight States, their activities unified under O. C. D. guidance. The Office of Civilian Defense can well be referred to as the general staff of the entire civilian effort, the strong right arm of the Army and Navy.

The councils of defense are in reality the coordinating and advisory bodies, responsible for seeing that the necessary programs are carried on in the communities. The councils of defense may be likened to a division or regiment, if you will, that has as its sector of operation, the community, and is charged with the responsibility of discovering the war needs therein, and then developing the plans necessary to meet such needs.

Civilian defense has a large scope of activities and covers almost every form of semimilitary, social and economic activities related to our war efforts, and must therefore enlist the time, energy, and interest of every patriotic citizen. It in effect covers the individual citizen's way and manner of living because we are all in this war, whether or not we are wearing a uniform. Whatever job we are doing has importance in the war effort, so we must do it better and harder than ever before. Our purpose is the complete mobilization of every man, woman, and child, to put their entire weight into this war by their participation in essential community programs, by their individual efforts.

The broad general concept of civilian defense, then, is the increase of our individual efforts as citizens to the extent that the task before us be accomplished. It starts in the homes, and I can't overemphasize the part women have in this great job—in keeping us healthy, in the proper care of the sick, in playing the leading role in Red Cross work, and other activities.

We must remember that the better someone does a job which is not directly connected with the war effort, the better someone else is going to be able to do a war job. Nonessential services are being done away with as the country strips for action. The fighting men must have the munition makers, food producers, and transport men behind

them. Behind these fellows, and keeping them going so that they can supply the fighting men, must be all the other workers of the country. The whole thing ties in together and no one is left out.

We are organizing defensively for the protection of civilian life and property, and offensively for the success of our Army and Navy.

CHAPTER VIII

WATER DISTRIBUTION HUMBOLDT RIVER SYSTEM—1941

By J. A. MILLAR, Supervising Water Commissioner

ORGANIZATION

J. A. MILLAR, Supervising Water Commissioner.....Entire River
D. E. WINCHELL, Water Commissioner.....Lovelock District
F. E. BACKUS, Water Commissioner.....Winnemucca District
MYRON CLARK, Water Commissioner.....Battle Mountain District
ORVIS STOCK, Water Commissioner.....Lamoille and South Fork Districts
ALBERT QUILL, Water Commissioner.....Starr Valley and North Fork Districts
JOE REYNOLDS, Hydrographer.....Willow Creek Reservoir
EDWARD KING, Hydrographer.....Elko District

The irrigation season of 1941 followed a winter of heavy snow and moderate temperatures. During the late summer and fall of 1940 there was very little rainfall, and as a result the winter snow fell on comparatively dry ground, resulting in large amounts of the spring runoff seeping into the ground. However, the runoff water that reached the stream system created a flow at the Palisade gaging station that gradually increased from 75 c.f.s. on January 1 to 2,150 c.f.s. on June 13. This represented the peak flow of the season, and from that time on the flow began to recede. However, the many rainstorms of the summer prevented the usual abrupt drop in flow at this point after the June peak had been reached.

As a rule the low stage flow occurs about August 15 of each year, and amounts to 20 c.f.s. On August 15, 1941, the recorded flow at this station was 140 c.f.s., and the low stage flow was not reached until September 15, when 48 c.f.s. was recorded. From this time until the end of the year many fall storms increased the flow gradually, until there was 230 c.f.s. at this gaging station on December 31.

During the seasons of 1935 to 1940, inclusive, the river bed was always dry during the months of August and September at the Comus gaging station. During the same period of 1941 the flow at this point never dropped below 30 c.f.s., and gradually increased during the fall months. There was sufficient water in the river below the Winnemucca district to fill the H. L. I. L. & P. Company reservoir before the end of the year.

No irrigation took place in the Winnemucca and Battle Mountain districts until the last week of April, and no irrigation took place on the tributary streams until after the middle of May in the Elko district. The river bottom lands in the Elko district began to flood early in April. With the exception of the above-named flooding condition, the entire flow of the river was allowed to reach the Rye Patch reservoir during all of March and nearly all of the month of April. After it reached the Rye Patch reservoir it was allowed to cumulate and was later released under a rotation system. Rotation systems were practiced in the Winnemucca, Battle Mountain, and tributary districts in the Elko district.

The large flows during the months of May and June or during the period of greatest need made it possible to serve all priorities. The

hay crops were matured early in July. However, haying operations were delayed due to the high July flow which kept the water table high and prevented the drainage of the adjoining fields.

The Humboldt River Commission directed the work of a hydrographer who measured the discharge of several main tributary streams in the Elko district. The acquired data was compiled and weekly reports were submitted to Dr. J. E. Church, State Meteorologist.

After June 30 distribution of water was conducted only in the Lovelock district and the Elko tributary districts, and continued until September 15. During the fall months of September, October and November the Elko district Water Commissioner was called upon to regulate and distribute water for stockwatering purposes. On July 1 the Winnemucca and Battle Mountain Water Commissioner and the hydrographers were laid off for the season.

WATER DISTRIBUTION HUMBOLDT RIVER SYSTEM—1942

By J. A. MILLAR, Supervising Water Commissioner

ORGANIZATION

J. A. MILLAR, Supervising Water Commissioner.....Entire River
JOHN FRANKLIN, Water Commissioner.....Lovelock District
F. E. BACKUS, Water Commissioner.....Winnemucca District
MYRON CLARK, Water Commissioner.....Battle Mountain District
ORVIS STOCK, Water Commissioner.....Elko District
EDWARD KING, Hydrographer.....Elko District

Heavy rainstorms of several hours' duration during the months of July and August 1941 kept the flow of the river primed, and the river bed never went dry as usual during the late summer and early fall months. The September rainfall measured 1.58 inches as compared to a normal of 0.79 inches. The rainfall for October and November was 2.39 inches and 2.56 inches, respectively, or about 1.00 inch above normal. During the first part of December heavy snowstorms occurred in the mountain areas of the watershed, while rain fell in the valleys. Mild weather followed these storms, causing the low foothill snow to melt in the daytime and freeze at night. In the last week of December another heavy snowstorm set in and lasted for ten days or more, covering the entire watershed with a heavy blanket of snow. This storm was followed by a period of subzero weather, which not only froze the covering of snow but also froze the film of water under the snow. A mild period followed this cold wave which caused serious flood conditions in and near the town of Wells. The Marys River began to reach flood stage, and the flow of North Fork River and other northern feeders pointed toward a runoff from the northern watershed. However, the mild weather was soon followed by a storm period that lasted from the middle of January until the last of February. On March 1 the upper end of the watershed was covered with a foot or more of frozen snow, underlain by a sheet of ice and frozen ground. The above summary of weather conditions from September to March serves as a forecast of the flood conditions that followed.

Although the precipitation during March was below normal, the temperatures were above normal, which not only caused flood conditions to start on the northern feeders, but also caused the southern feeders to flood very much earlier than usual. Heavy rains during the

first week of April supplemented the flood condition and caused the heaviest runoff through the city of Elko since the year 1910. Prior to the rainstorm all the river bottom land from Wells to Elko was under water. On April 7 the peak flow passed through the city of Elko, inundating all that part of the city adjacent to the river, forcing the residents to abandon their homes. On April 8 a peak flow of about 4,500 c.f.s. reached and passed the Palisade gaging station. By this time all the bottom lands from Wells to the Palisade Canyon were under several feet of water. The river flow immediately below the Palisade gaging station was augmented by a peak flow of about 500 c.f.s. from Pine Creek, which created a total flow of 5,000 c.f.s. at the head of the Battle Mountain Basin. This heavy flow of water soon covered all the river bottom land from Beowawe to the Filippini ranch. That part of the town of Beowawe north of the Western Pacific Railroad tracks was inundated to a depth of at least two feet, and remained under water for over two weeks. Bridges had to be built from the Western Pacific roadbed to the Post Office and to the Allen store. Residents of this part of town were forced to abandon their homes.

The dredged channel through the Filippini ranch was large enough to take care of the flood water. However, most of the area of the said ranch north of the river channel was covered with water due to the heavy overflow on the Dunphy ranch above.

In addition to the above-named flows, Boulder and Rock Creeks were discharging about 1,000 c.f.s. into the Battle Mountain Basin. The Boulder and Rock Creek flows find their way into the old river channel, which in turn has its confluence with the present river channel above the Licking ranch near Battle Mountain. The approximate flow of 6,000 c.f.s. at this point put two to three feet of water over the entire Licking ranch, and it was not until the first of July that the river showed any signs of subsiding.

The dredged channel below the Licking ranch and through the Land Development ranch eliminated part of the flooding condition, but as soon as the water reached the natural channel on the Russell "25" ranch, flooding again took place, and the entire river bottom land was under at least two feet of water. Part of this overflow, together with the overflow at the Wilcox dam, put about 250 c.f.s. in the Outside Slough. From the Wilcox dam to the Pinson bridge general flooding took place in spite of dredged channels.

On or about the 20th of April flood conditions began in the Winnemucca district, and in less than ten days all of the river bottom land from the Pinson bridge to the gaging station below the Hillyer ranch was under at least a foot of water. Most of this area was still under water on July 1.

Although the river flow fluctuated materially during the month of May, the flood and overflow condition never ceased in the Elko district until the last part of June. On July 3 it was apparent that the flood condition in the upper end of the Battle Mountain district was subsiding, and on July 10 the flow of the river near Beowawe was confined to the river channel. However, the lower end of the Battle Mountain district was still at flood stage.

The flow of the river at the point of diversion of the H. L. I. L. & P. Company intake or feeder canal from September 15 to December 31

was sufficient to fill the same company's reservoir to a capacity of 40,000 acre-feet, and on January 1, 1942, all the river water was turned into the Rye Patch reservoir. However, on March 1 the intake canal was again opened and a flow of about 150 c.f.s. was diverted into the reservoir until March 15.

During the period from January 1 to July 1 the following storage took place in the Rye Patch reservoir:

January 1	35,881 acre-feet
February 1	45,460 acre-feet
March 1	62,314 acre-feet
April 1	81,905 acre-feet
May 1	116,954 acre-feet
June 1	158,022 acre-feet
July 1	160,823 acre-feet

The above storage took place in spite of the following releases:

March	455.00 acre-feet
April	12,541.00 acre-feet
May	51,944.00 acre-feet
June	68,681.00 acre-feet

On May 17 more water than could be beneficially used was released from the Rye Patch reservoir in order to provide a cushion for the expected June high water and to protect the Rodgers diversion dam. The releases were increased from 800 c.f.s. to 1,527 c.f.s on May 27 and then gradually decreased to 1,100 c.f.s. on June 28. The amount of water not used for irrigation was allowed to flow into the Humboldt River Sink. During the later part of June the Rodgers dam was unable to withstand the released flows, and was completely undermined and destroyed. About ten days later the spillway gates were closed, and only the necessary water was released by means of the regular release pipes. It is estimated that the reservoir will be filled some time before the last of July.

No irrigation water was released from the H. L. I. L. & P. Company reservoir. However, during the later part of May about 200 c.f.s. of the river flow was diverted into the feeder canal, conveyed through the reservoir and released into the Rye Patch reservoir. This was done to protect the road leading from Mill City to the Tungsten mines.

The Willow Creek reservoir was filled by the last of April and sufficient water was released to maintain a water level just below the crest of the spillway. This released water was allowed to flow into Rock Creek and thence to the Humboldt River until irrigation started about the middle of May.

According to the preliminary figures of the Geological Survey, Water Resources Branch, the runoff of the Humboldt River through the Palisade gaging station from October to June was about 510,000 acre-feet, and the March to June runoff through the same station was about 447,000 acre-feet. The average annual runoff, 1903–1906 and 1912–1942, has been about 243,500 acre-feet.

The runoff through the Callahan gaging station from January to June, inclusive, was about 293,000 acre-feet, and the March to June runoff through the same station was 262,670 acre-feet.

RYE PATCH RESERVOIR STORAGE—1942

January 1	35,881 acre-feet
February 1	45,560 acre-feet
March 1	62,314 acre-feet
April 1	81,905 acre-feet
May 1	116,954 acre-feet
June 1	158,022 acre-feet
July 1	160,823 acre-feet

Capacity at maximum water surface elevation—179,020 acre-feet.

RYE PATCH RESERVOIR RELEASES—1942

Date	March, c.f.s.	April, c.f.s.	May, c.f.s.	June, c.f.s.
1	.....	75.0	465.5	1,329.5
2	.....	75.0	396.0	1,329.5
3	.....	75.0	381.5	1,330.0
4	.....	75.0	383.0	1,330.0
5	.....	75.0	386.0	1,330.0
6	.....	75.0	355.0	1,330.0
7	.....	75.5	443.0	1,330.0
8	.....	91.0	459.5	1,330.0
9	.....	99.5	460.0	1,197.5
10	.....	117.0	460.5	1,103.0
11	.....	130.5	461.0	1,103.0
12	.....	149.5	461.0	1,103.0
13	.....	161.0	461.5	1,103.0
14	.....	148.0	462.0	1,103.0
15	.....	155.5	544.0	1,103.0
16	.....	161.5	785.0	1,103.0
17	.....	161.5	822.5	1,103.0
18	.....	162.0	823.5	1,103.0
19	.....	226.0	921.0	1,103.0
20	.....	263.0	1,049.0	1,103.0
21	.....	327.0	1,068.0	1,103.0
22	.....	373.5	1,133.5	1,103.0
23	.....	373.5	1,271.5	1,103.0
24	.....	373.5	1,413.5	1,103.0
25	.....	373.5	1,527.5	1,103.0
26	.....	373.5	1,527.5	1,103.0
27	.....	375.5	1,527.5	1,103.0
28	3.0	376.0	1,524.5	1,103.0
29	74.5	376.0	1,401.0	883.5
30	75.0	397.0	1,329.5	663.5
31	75.0	.....	1,329.5	
C.F.S.	227.5	6,270.5	25,972.0	34,340.5
Acre-feet	455.0	12,541.0	51,944.0	68,681.0

HUMBOLDT RIVER AT CALLAHAN'S—1942

Date	January c.f.s.	February c.f.s.	March c.f.s.	April c.f.s.	May c.f.s.	June c.f.s.
1	142	300	343	648	1,700	1,347
2	142	300	337	656	1,725	1,350
3	140	300	339	668	1,755	1,345
4	143	300	344	692	1,850	1,345
5	144	300	287	700	1,950	1,345
6	144	300	244	706	2,050	1,320
7	104	348	237	715	2,130	1,320
8	104	360	228	720	2,125	1,320
9	104	377	225	722	2,050	1,320
10	104	406	223	725	1,950	1,330
11	108	404	227	734	1,850	1,335
12	110	416	234	715	1,850	1,329
13	112	426	244	694	1,850	1,330
14	112	426	260	717	1,830	1,328
15	112	400	290	752	1,845	1,326
16	162	400	381	772	1,850	1,320
17	168	398	438	775	1,835	1,320
18	170	422	460	775	1,690	1,318
19	175	408	480	775	1,680	1,310
20	176	356	499	788	1,610	1,314
21	180	348	512	845	1,585	1,315
22	180	386	527	876	1,550	1,318
23	183	381	537	913	1,550	1,260
24	184	377	550	946	1,525	1,256
25	190	373	562	996	1,520	1,254
26	204	369	577	1,077	1,500	1,250
27	220	363	592	1,350	1,495	1,235
28	222	354	602	1,440	1,440	1,240
29	224	.....	611	1,528	1,400	1,220
30	225	.....	621	1,652	1,380	1,220
31	230	.....	632	.....	1,360	
Acre-feet	9,940	20,596	25,286	52,144	106,960	78,280

DISCHARGE HUMBOLDT RIVER AT PALISADE, NEVADA—1942

Date	January		February		March	
	Gage	C.F.S.	Gage	C.F.S.	Gage	C.F.S.
1	2.90	181.00	3.38	342.40	3.08	235.80
2	2.66	122.60	3.46	374.60	3.04	222.40
3	3.14	255.60	3.56	416.80	3.10	242.00
4	3.00	210.00	3.66	461.60	3.18	269.20
5	3.14	255.60	3.80	529.00	3.22	283.20
6	3.34	327.20	3.70	480.00	3.36	334.80
7	3.22	283.20	3.78	519.20	3.60	434.00
8	3.14	255.60	3.84	549.80	3.68	470.80
9	2.98	204.20	3.76	509.40	3.82	539.40
10	2.98	204.20	3.74	499.60	4.00	635.00
11	3.00	210.00	3.60	434.00	4.68	1,056.00
12	3.00	210.00	3.48	382.80	5.20	1,420.00
13	3.20	276.00	3.34	327.20	5.40	1,570.00
14	3.00	210.00	3.34	327.20	5.44	1,602.00
15	3.02	216.40	3.16	262.40	5.26	1,462.00
16	2.98	204.20	3.26	297.60	5.10	1,350.00
17	2.98	204.20	3.22	283.20	5.20	1,420.00
18	2.96	198.40	3.16	262.40	5.44	1,602.00
19	3.02	216.40	3.10	242.00	5.40	1,570.00
20	3.00	210.00	3.06	229.20	4.98	1,266.00
21	3.02	216.40	3.08	235.80	5.06	1,322.00
22	3.00	210.00	3.16	262.40	4.92	1,224.00
23	3.00	210.00	3.16	262.40	4.62	1,014.00
24	2.96	198.40	3.08	235.80	4.78	1,126.00
25	3.06	229.20	3.10	242.00	4.60	1,000.00
26	3.14	255.60	3.18	269.20	4.68	1,056.00
27	3.14	255.60	3.24	290.40	4.98	1,266.00
28	3.44	366.40	3.18	269.20	5.26	1,462.00
29	3.44	366.40	.....	.....	5.44	1,602.00
30	3.34	327.20	.....	.....	5.40	1,570.00
31	3.38	342.40	.....	.....	5.26	1,462.00
C.F.S.		7,432.40		9,797.60		32,088.60
Acre-feet		14,864.80		19,595.20		64,177.20
Cumulated acre-feet		.....		34,460.00		98,637.20

DISCHARGE HUMBOLDT RIVER AT PALISADE, NEVADA—1942

Date	April		May		June	
	Gage	C.F.S.	Gage	C.F.S.	Gage	C.F.S.
1	5.60	1,730.00	6.00	2,050.00	6.96	2,894.00
2	5.72	1,826.00	5.96	2,018.00	6.68	2,642.00
3	6.28	2,282.00	6.00	2,050.00	6.46	2,444.00
4	7.90	3,740.00	5.86	1,938.00	6.26	2,264.00
5	8.50	4,280.00	5.76	1,858.00	6.14	2,162.00
6	8.40	4,190.00	5.66	1,778.00	6.00	2,050.00
7	8.50	4,280.00	5.46	1,618.00	6.04	2,082.00
8	8.80	4,550.00	5.30	1,490.00	6.06	2,098.00
9	8.15	3,965.00	5.14	1,378.00	6.24	2,246.00
10	7.13	3,047.00	5.06	1,322.00	6.26	2,264.00
11	7.05	2,975.00	5.06	1,322.00	6.22	2,228.00
12	6.98	2,912.00	5.10	1,350.00	6.76	2,714.00
13	6.94	2,876.00	5.14	1,378.00	6.92	2,858.00
14	6.82	2,768.00	5.20	1,420.00	6.68	2,642.00
15	6.82	2,768.00	5.20	1,420.00	6.60	2,570.00
16	6.76	2,714.00	5.32	1,506.00	6.66	2,624.00
17	6.76	2,714.00	5.40	1,570.00	6.52	2,498.00
18	6.78	2,732.00	5.48	1,634.00	6.40	2,390.00
19	6.70	2,660.00	5.46	1,618.00	6.24	2,246.00
20	6.60	2,570.00	5.42	1,586.00	6.20	2,210.00
21	6.56	2,534.00	5.48	1,634.00	6.14	2,162.00
22	6.56	2,534.00	5.44	1,602.00	6.02	2,066.00
23	6.18	2,194.00	5.38	1,554.00	5.88	1,954.00
24	6.06	2,098.00	5.42	1,586.00	5.84	1,922.00
25	5.98	2,034.00	5.56	1,698.00	5.80	1,890.00
26	5.94	2,002.00	5.70	1,810.00	5.70	1,810.00
27	5.86	1,938.00	5.96	2,018.00	5.62	1,746.00
28	5.92	1,986.00	6.38	2,372.00	5.44	1,602.00
29	5.92	1,986.00	6.68	2,642.00	5.28	1,476.00
30	5.96	2,018.00	7.02	2,948.00	5.16	1,392.00
31	.....	.....	7.20	3,110.00		
C.F.S.		82,903.00		55,278.00		66,146.00
Acre-feet		165,806.00		110,556.00		132,292.00
Cumulated acre-feet		264,443.20		374,999.20		507,291.20

PAHRANAGAT LAKE AND TRIBUTARIES

By Donald K. Perry, Water Commissioner

DISTRIBUTION, 1941

Water distribution under the direction of a water commissioner began on July 10, 1941.

The sources of water for lands under irrigation in Pahranagat Valley are those springs which are known as Hiko, Crystal, and Ash springs. Since each of the above-named springs has its own distribution system, it is best, for the purpose of this report, to describe each spring individually.

HIKO SPRING

Hiko spring is located in the north end of Pahranagat Valley about a half mile east of the village of Hiko.

An embankment was built in front of the spring in 1939. At the same time three flumes of exactly the same dimensions were set on an exact level and automatically divide the water accurately among the various users.

There are three ditches heading from the pool at Hiko spring, but only two of them are allowed to flow at the same time. The center one, known as the Schofield ditch, flows continuously. The other two ditches, the Hiko Mining and Milling ditch flowing to the north, and the Castle ditch flowing to the south, alternate their share of the flow according to a rotation schedule which has been in successful operation for a number of years.

Very little time or trouble need be spent on distribution of water from Hiko spring because the distribution system is all located right at the spring and is absolutely tamper proof. The water commissioner made it a practice to visit Hiko spring at least every other day to check on the flow of the spring and rake out any debris which may have collected in the flumes. A nearly constant flow of 6.52 c.f.s. was recorded.

CRYSTAL SPRINGS

Crystal springs are located in the upper end of Pahranagat Valley about a half mile west of U. S. Highway 93.

The nearly constant continuous flow of these springs was 9.68 c.f.s. Water from these springs is used to irrigate lands belonging to the Lincoln Land & Livestock Company and to Mrs. C. W. Wright. The flow of the stream is used by each owner on a rotation basis. The rotation schedule has been in effect for several years and has proven very satisfactory to all concerned.

ASH SPRINGS

Ash springs, the largest of the three sets of springs in Pahranagat Valley, is located adjacent to U. S. Highway 93 about eight miles above the town of Alamo.

Water from Ash springs formerly was divided into eight separate heads or streams, resulting in great losses from seepage and evaporation. With the cooperation of the water users, the commissioner worked out a rotation schedule for the users on the old W. H. Sharp and Chism properties. This cut the number of continuous streams from eight to four and resulted in less water loss and less friction

among the users and hence greater irrigating efficiency.

With the four remaining irrigating streams, the commissioner endeavored to maintain a constant flow to each group of cooperators. These flows were as follows:

Sharp and Chism properties	4.73 c.f.s.
Andhers and Higbee	1.24 c.f.s.
Alamo Canal and others rotating with the Alamo Irrigation Company	7.40 c.f.s.
Richard & Wedge ditch	2.18 c.f.s.

As a whole, the distribution system for Ash springs is extremely poor and wasteful. There is a lack of proper diversions and measuring devices. Generally the ditches are so low in gradient and so poorly maintained that the loss from seepage and evaporation is terrific. On the main channel alone, a loss running from 4 to 7 c.f.s. is evident. The amount of loss depends upon the heat and the degree of clogging of the channel.

The water commissioner has gone over the plans of the Soil Conservation Service for the improvement of the Ash spring irrigation and drainage systems. If these plans were put into effect, the problem of Ash spring distribution would be completely solved. However, local prejudice and factional interests seem to be the only factors which are holding up this program.

DISTRIBUTION, 1942

The water commissioner arrived in Pahranagat Valley to regulate the distribution of water on June 7, 1942.

No great shortage of water to any user or group of users was particularly evident upon that date. Some friction had arisen, however, as some users had either lost or forgotten to use their rotation schedules which had been worked out in former years. These matters were quickly straightened out and the rotation schedules put into practice.

A slight change was necessary in the rotation schedule for Crystal spring. This was due to the fact that part of the Lincoln Land & Livestock Company lands had been sold to a Mr. Byrnes. The old schedule for the Lincoln Land & Livestock Company was simply divided between the old and new owners on a land basis. This took care of the situation to the satisfaction of both users.

A change was also necessary in the new schedule, which was made last year, on the old W. H. Sharp properties stream from Ash Creek. This change was necessary because the owners had failed to clean their ditch sufficiently well to carry the combined head of water under rotation schedule. Their lands were simply dropped from the rotation schedule and they were allowed a smaller continuous flow according to their water rights. The rest of the users are successfully continuing the rotation schedule, though with a diminished stream.

As a result of this change there are five continuous flows from Ash Spring Creek instead of four, as reported last year. The flows are allowed as follows:

Chism & West Sharp users	3.65 c.f.s.
Andhers & Higbee ditch	1.24 c.f.s.
Richard-Wedge ditch	2.18 c.f.s.
Alamo canal and cooperators	7.40 c.f.s.
East Sharp ditch	1.18 c.f.s.

DISTRIBUTION LITTLE HUMBOLDT RIVER AND TRIBUTARIES SEASONS 1941 AND 1942 TO JUNE 30, 1942

By E. H. Green, Water Commissioner

The 1941 season was one of the best for many years, both from the standpoint of water and growing conditions. A good runoff in March helped to serve the lower users, and both spring and summer rains kept the creeks flowing all year. This condition was true of streams such as Mullinax which are considered as flash streams and usually stop by the first of July.

The season for 1942 was opened on March 1.

The users above Shelton Lane did not start to use water until late in April.

There was a short runoff in March, but for the most part March was cold and very little snow melted other than that which was low in the foothills.

The same condition prevailed in April.

The snow survey on the first of April showed a lower water content and less snow than in the year 1941, but late April snowstorms increased the moisture and replaced snow melted in March.

Martin Creek had its peak in April, but flowed more over the entire month of May and began its decline after the middle of June.

The Little Humboldt River had its peak in April, and flowed the entire month a better average than in May or June.

DISTRIBUTION, 1942

In order to deliver water to the Godchaux ranch (now owned by Johnston Bros.) the dam that had been placed in Martin Creek where it turns to enter the Big Ditch was removed and water from Martin Creek has since been delivered that way to both Johnston Bros. and the Miller ranches. (This was the first water from Martin Creek to be delivered to Johnston Bros. since they had bought the ranch two years before.)

In May the most westerly channel connecting with Cottonwood Creek through the Laws property was opened up and Cottonwood water was turned that way. This is the most direct and best channel for distribution of Cottonwood Creek water to Johnston Bros. and the Miller ranches, and does not interfere with the Law ranch irrigation system any more than any other route. (This was the first Cottonwood water to be delivered to the Millers or Johnsons since 1938.)

In June the Tule Slough or Big Ditch was opened to serve the Johnston Brothers' Tule Slough right, which is water from the Little Humboldt River, Cottonwood Creek, and Martin Creek.

RECOMMENDATIONS

After careful study of the channel conditions and giving consideration to the slope of the valley, I find that all the streams break to the west. Keeping this in mind, I believe a ditch run from Martin Creek just above the Shelton Lane to Cottonwood Creek would pick up all the overflow water west of Martin Creek that now floods Shelton Lane. This would also make it possible to run the water through the west branch of Martin Creek into the Muffler slough, thus relieving the flood condition on the Stewart's home ranch without causing anyone else damage.

On the east side of Martin Creek the same sort of ditch could be dug to pick up the overflow from the fields north of the Shelton Lane and carry the water back to Martin Creek instead of allowing the water to be lost on class (C) ground. This season more than 20 c.f.s. was lost that way for a month's time. This flow watered ground without any water right.

Stone House Creek, Colony Creek, Wash O'Neil Creek, and Provo Creek should all have channels cut through to Cottonwood Creek. Much of the water from these creeks floods land with no water right at all.

The system of cumulation as practiced by the upper users is unfair and must in some way be altered until proper channels are made to carry the water to the lower users so that a rotation can be carried on.

DISCHARGE OF LITTLE HUMBOLDT RIVER AND TRIBUTARIES IN ACRE-FEET

Data from Water Commissioner's Report and U. S. G. S.

Year	Little Humboldt River	Martin Creek	Cotton-wood Creek	Indian Creek	Mullinax Creek	Little Cotton-wood Creek	Lamance Creek	Handy Creek	Colony Creek	Beef Creek	Stone-house Creek	Wash O'Neal Creek	Provo Creek	Total
1922.....	28,106	28,400												
1923.....	12,100	13,700												
1924.....	3,680	8,800												
1925.....	10,200	16,900												
1926.....	12,200	17,600	2,950											
1927.....	15,022	25,661	7,990											
1928.....	.....	20,700	6,140											
1929.....	.....	11,300	2,800											
1930.....	.....	13,500	2,990											
1931.....	2,770	5,910	987	.....	130	.....	.....	.....	50					
1932.....	20,942	33,200	7,180	5,168	3 887	.....	454	1,110	2,521	.....	2,562	1,932	826	79,782
1933.....	4,309	13,500	2,335	2,178	1,906	606	163	424	831	194	792	564	203	28,005
1934.....	3,293	8,640	1,880	912	952	451	118	278	601	87	825	356	106	18,499
1935.....	9,013	21,358	4,445	4,782	4,023	1,266	310	787	1,933	3,524	1,750	391	962	54,544
1936.....	8,954	19,910	3,463	3,804	3,701	881	625	1,335	1,890	604	2,706	1,701	662	50,236
1937.....	9,425	16,590	2,826	2,761	4,125	659	190	540	924	327	2,214	836	410	41,827
1938.....	21,237	34,240	9.278	8,836	12,340	2,084	702	1,565	2,923	1,257	4,969	2,429	1,309	102,986
1939.....	7,251	10,254	2,585	2,339	2,482	930	372	797	1,747	640	1,591	999	534	32,521
1940*.....	8,555	20,834	4,241	3,154	2,533	719	424	625	1,700	613	945	891	564	45,798
1941.....	10,107	24,170	6,136	2,663	2,669	1,362	1,636	1,245	2,596	1,232	3,152	2,041	2,260	60,669
1942*.....	12,711	18,257	7,507	5,945	7,147	1,263	515	985	2,071	897	5,149	2,100	1,512	66,059

*Discharges to June 30.

DUCKWATER CREEK WATER DISTRIBUTION

By NYE TOGNONI, Water Commissioner

Duckwater Creek is situated about fifty miles south of Eureka, Nevada, in Nye County. Approximately 4,000 acres are irrigated in an area about twelve miles in length and from one-half to two miles in width.

The principal source of water is known as the "Big Warm Spring" located at the head of Duckwater Creek, and having a nearly constant flow of from 12.5 to 14 c.f.s. This flow is supplemented by approximately 12 c.f.s. from numerous small springs along the main channel, the first group being in the neighborhood of 2½ miles south of the head of the creek and the second group or east branch at about three miles. The early season's flow of these springs is augmented by underground storage of water from the "Big Warm Spring" which is forced onto the plateau lakes to sink during the winter months.

The largest channel loss is in the first two miles of creek bottom where a sandy stream bed along the top of a well-broken-up limestone plateau accounts for a loss of from 2½ to 3 c.f.s. This loss of approximately 10% of the flow of the Duckwater warm springs is most keenly felt by the Florio home ranch, now part of Duckwater Indian Reservation, since one of its decreed rights is the most recent priority on this irrigation system.

The Indian Service plans to build a new channel straight to what is known as the old stone mill. This will shorten the stream bed by nearly one mile and eliminate the poor bottom now traversed. If necessary the new channel will be lined with concrete and thus bring about an even greater saving of water.

DISTRIBUTION, 1941

Due to the late cool spring I was not called to Duckwater until May 9. I found that but 7.75 c.f.s. of the discharge of the "Big Warm Spring" was flowing into Duckwater Creek, with the remaining 6.84 c.f.s. flowing into the plateau lakes. A total of 30.83 c.f.s. was being diverted on May 10, which is a surplus of 2.43 c.f.s. over the decreed rights.

As usual the tailings ditch below the Callaway ranch was washed out, but since there was less than 2 c.f.s. flowing in this ditch it was repaired at once and by May 15 was carrying the tailings back into the main channel. On the completion of this work I installed a Lietz horizontal water stage recorder at the Irwin and Irving-Vanover weirs and used it throughout the season as a check on the water diverted to the Irwin and Irving-Vanover ranches.

The regular Mendes and Munson rotation schedule was started on May 10 with Mendes receiving 5½ days and Munson 3½ days of 3.95 c.f.s. for irrigation purposes, together with the full 9 days of .25 c.f.s. domestic water delivered to the Mendes lower ranch. Since this "Old Mendes Right" of 4.20 c.f.s. is a third priority, it sometimes is cut to as low as 2.50 c.f.s. when the total daily diversions reach from 19.00 to 22.60 c.f.s.

On May 17 a regular rotation system was developed for the Indian Reservation. By dividing the entire Florio decreed rights into two streams, one to be used by the assignments on the upper half of the

reservation and one by those on the lower half, a system was developed by which each of the eighteen water users would have at least 2.79 c.f.s. for irrigating two out of every eighteen days. By rotating the two streams on alternative days only one visit per day to the reservation was normally required.

The only improvement in the district during the 1941 season was the new Cippoletti weir built by Ed. Halstead at his No. 3 diversion.

Due to the numerous heavy rains all the decreed rights of 28.40 c.f.s. were satisfied until June 17. Only a very slow drop of the total daily diversions was apparent, and on August 6 a low of 20.17 c.f.s. was recorded. With the arrival of the late summer rains late in August there was no necessity for my remaining after September 1.

DISTRIBUTION, 1942

Another late cold spring prevented a great deal of early irrigation and consequently I was not called to Duckwater until May 9.

The tailings ditch below the Callaway ranch, as in the past, was washed out and the large flow of tailings from the Callaway and Halstead ranches prevented its repair until May 24. It is customary upon the completion of this tailings ditch in the spring to install a Lietz horizontal water stage recorder above the Irwin and Irving-Vanover weirs. As yet this year I have not received this recorder from the repair shop to which it was sent.

The usual Mendes and Munson rotation system began on May 12 and the regular Indian Reservation rotation schedule began on May 15.

On making my first round of the diversions I found all the diversions in usable condition and a total of 31.87 c.f.s. being diverted. 7.09 c.f.s. was flowing from the "Big Warm Spring" into the plateau lakes.

All of the water rights of 28.40 c.f.s. were satisfied until June 3. Due to the dry windy weather, the runoff from the hay meadows began to dry up about this time and the usual rapid drop in the total measured daily diversions began nearly a month early. Between June 5 and June 24 a drop of 6.76 c.f.s., or nearly 25% in the total diverted water has been recorded. This gives a low of 21.22 c.f.s. on the latter date, which is normal for the latter part of July.

This shortage will not be very apparent to the most of the users until after the wild hay crop is harvested and water is needed for over 1,000 acres of pasture besides the regular crops of grain, potatoes, etc.

Since nearly all of the wild hay meadows are third priorities, to which the entire drop in total flow below 22.80 c.f.s. is a loss, and the water table has dropped from one to three feet, this valley is very apt to be without the good late summer and early fall pastures it has enjoyed for the past few years.

AVERAGES OF TOTAL DIVERSIONS IN SECOND FEET, DUCKWATER CREEK, NYE COUNTY, NEVADA

Irrigation season	March	April	May	June	July	Aug.	Sept.	Oct.	Maximum total daily diversion c.f.s.	Minimum total daily diversion c.f.s.	Acre-feet for the season
1930	.....	36.44	33.51	22.68	19.60	21.68	22.75	.....	41.67	18.20	9,615.51
1931	37.56[5]	27.93	26.45	21.17	19.72	19.49	18.96	.....	38.60	16.91	8,385.09
1932	.....	32.18[2]	27.76	22.95	20.74	20.43	20.85	.....	38.85	18.99	8,307.55
1933	.....	31.83[1]	27.59	23.94	21.53	20.77	20.23	.....	37.56	19.09	8,445.85
1934	.....	29.81[4]	27.57	23.14	20.78	20.92	21.34	22.50[5]	34.56	20.24	8,358.60
1935	.....	29.09[6]	26.85	25.01	22.39	21.02	21.01	.....	30.10	20.30	7,484.40
1936	.....	29.35[7]	25.93	22.75	22.18	23.34	22.86[8]	.....	31.94	20.40	8,477.34
1937	.....	.....	27.87[9]	27.47	23.43	22.82	21.87	22.92	30.97	19.65	8,533.80
1938	.....	32.26[10]	32.34	25.80	23.78	20.91	.....	.....	37.69	19.30	7,303.00
1939	.....	32.05[11]	28.82	22.30	21.52	20.11	21.42	24.05[12]	34.92	18.28	8,140.00
1940	.....	33.77[13]	25.39	21.34	20.40	19.18	20.33[15]	.....	41.62	18.10	8,560.12
1941	.....	.....	28.70[14]	27.29	23.67	21.00[17]	.....	.....	30.83	20.05	5,669.74
1942	.....	.....	30.03[16]	24.80							

[1]Beginning April 7. [2]Beginning April 8. [3]Beginning March 28. [4]April 17 to April 30, inclusive. [5]October 1 to October 14, inclusive. [6]April 22 to April 30, inclusive. [7]April 10 to April 30, inclusive. [8]To October 4, inclusive. [9]Beginning May 9. [10]Beginning April 14. [11]Beginning April 15. [12]To October 5, inclusive. [13]Beginning April 2. [14]Beginning May 10. [15]To October 1. [16]Beginning May 10. [17]Ending August 24, inclusive.

WATER MEASURING STRUCTURES ON BAKER AND LEHMAN CREEKS, BAKER, WHITE PINE COUNTY, NEVADA

In order to facilitate the distribution of the decreed waters of Baker and Lehman Creeks at Baker, White Pine County, Nevada, weirs were installed by the Nevada State Engineer under the supervision of F. N. Dondero during the month of August 1940. These structures, made of concrete, are six inches wide and vary in height from two and a half feet to three feet and are from six to twelve feet long. They are provided with an opening in the center for removable headboards containing the various types and sizes of weirs. The structures are also provided with concrete aprons four inches in thickness imbedded deeply below the bottom of the ditches. The headboards are of two-inch furrowed select fir lumber, and patterned after a headgate, fit in concrete grooves of the structures and held firmly in place by a two-inch by six-inch headboard bolted on top of the concrete. These removable headboards are for the purpose of providing any changes that may be made in the type of weir without altering the permanent concrete structure.

Orifices of varying dimensions in fourteen-gage galvanized iron were placed in all of the headboards except that for the Grant C. Smith, formerly B. P. Hockman, water right, which water measuring device consists of an eighteen-inch removable rectangular weir made of two-inch wood with a metal strip for edges and fitting in the concrete structure in the same manner as in the case of the orifices. The head required for each orifice to supply the decreed amount of water was determined by actual measurement by means of either a V-notch or an eighteen-inch rectangular weir, and is indicated on the headboard by means of a small augured hole.

CHAPTER IX

Water Measurement Work

(In Cooperation With the United States Geological Survey)

By A. B. PURTON, District Engineer, Water Resources Branch, United States Geological Survey

General stream gaging work in Nevada has been continued during the biennium under the usual form of cooperative agreement between the State Engineer and the United States Geological Survey.

At the beginning of the biennium, records were being obtained at 24 gaging stations, of which six were on reservoirs or lakes. On June 30, 1942, the number of stations had been increased to 25 by the establishment on December 4, 1941, of a new station on the Little Humboldt River at the Chimney dam site in Humboldt County.

The cooperative stream gaging program outlined above is restricted, by reason of limited funds, to the larger water sources of the State where the stations can be in more or less compact groups and the larger organizations of water users are able to assist substantially in the construction and operation of stations.

As a result largely of funds made available by the Public Works Administration, United States Bureau of Reclamation, and the Office of Indian Affairs for construction, satisfactory progress has been made in putting nearly all of the gaging stations in first-class condition. All of the 19 river and canal stations are equipped with water-stage recorders and the river stations have standard cableways for making current meter measurements.

Acknowledgments are due to the water users, particularly in the Walker and Humboldt River basins, for cooperation and assistance in maintaining stations in those basins; to the United States Office of Indian Affairs for financial support and other cooperation in the Owyhee River basin; and to the Navy Department for elevations of Walker Lake near Hawthorne. Records for the Carson River at Fort Churchill have been furnished by the Newlands Project and those for the Humboldt River near Imlay and Oreana by the Pershing County Water Conservation District.

The data obtained as the result of these cooperative investigations are published in the annual water supply papers of the Geological Survey. The United States has been divided into twelve primary drainage basins, and the annual reports on stream measurements are published in a series of fourteen water supply papers. Data for each primary basin appear in one water supply paper except for the Columbia River basin for which records are published in three papers. Stream flow data for Nevada appear in the water supply papers for the Colorado River, Columbia River, and Great Basin. These publications are available for consultation at the State Engineer's Office, Carson City, Nevada, and at the district office of the Geological Survey, 303 Federal Building, Salt Lake City, Utah. Data in advance of publication and those for previous years at individual stations can be furnished in blueprint form upon application to the District Engineer.

On June 30, 1942, records were being obtained at the stations shown in the following list:

COLORADO RIVER BASIN

Virgin River at Littlefield, Arizona, 1929–.*

SNAKE RIVER BASIN

Salmon Falls Creek near San Jacinto, Nevada, 1906–1916; 1919–.†
Owyhee River below Wild Horse Dam, 1937–.
Owyhee River at Mountain City, Nevada, 1927–.
Wild Horse Reservoir, 1939–.
Owyhee River at Owyhee, 1939–.

GREAT BASIN AND MINOR BASINS IN NEVADA

Walker Lake Basin—
- Bridgeport Reservoir near Bridgeport, California, 1931–.
- East Walker River near Bridgeport, California, 1911–1914; 1922–.
- Walker Lake near Hawthorne, Nevada, 1928–.
- West Walker River near Coleville, California, 1902–1910; 1915–.
- Topaz Reservoir near Topaz, California, 1931–.

Pyramid Lake Basin—
- Pyramid Lake at Nixon, Nevada, 1867–.

Carson–Humboldt Sink—
- Carson River near Carson City, 1939–.
- Carson River near Fort Churchill, Nevada, 1911–.
- East Fork of Carson River at Horseshoe Bend, 1890–1893; 1900–1906; 1908–1910; 1924–1929; 1935–1937; 1939–.
- West Fork of Carson River at Woodfords, California, 1890–1892; 1900–1920; 1939–.
- Humboldt River at Palisade, Nevada, 1902–1906; 1911–.
- Humboldt River near Imlay, Nevada, 1935–.
- Rye Patch Reservoir, 1939–.
- Humboldt River near Oreana, Nevada, 1896–1922; 1924–.
- South Fork of Humboldt River near Elko, Nevada, 1896–1909; 1910.
- Little Humboldt River at Chimney dam site, 1941–.
- Martin Creek near Paradise Valley, Nevada, 1925–.
- H. L. I. L. & P. Co.'s Feeder Canal near Mill City, Nevada, 1914–1931; 1936–.
- H. L. I. L. & P. Co.'s Outlet Canal near Humboldt, Nevada, 1914–.

*Operated since April 1, 1942, by district office at Tucson, Arizona.
†Operated by district office at Boise, Idaho.

CHAPTER X

Snow Surveys

By H. P. Boardman, Chairman Forecast Committee, Nevada Cooperative Snow Surveys

I. CENTRAL SIERRA

As was pointed out in the last biennial report, the rise of Lake Tahoe and the Truckee River runoff for 1940 greatly exceeded the forecast. The previous winter (December–March), precipitation was from 158% to 179% of normal at six U. S. Weather Bureau Stations including Tahoe and Truckee and four stations in the Sierras directly west of the Truckee and Tahoe basins. In spite of this, the April 1 snow surveys indicated only about normal water content for the high level courses and below 60% of normal for the low level courses. The partial explanation being much rain in January and March and a runoff that was above normal by about 18% in January and February and 75% in March.

The excess winter precipitation greatly surpassed quantitatively the excess winter runoff plus the discrepancy between snow survey forecast and actual April–July runoff, so it must be that much of the winter precipitation in the form of rain, combined with March melting, was stored in the ground and given off along with melting snow to yield the high April–July runoff.

1941

The organizations cooperating in our Sierra Snow Survey work for 1941 were: The Nevada Cooperative Snow Surveys, including the State of Nevada through the State Engineer's Office, the Truckee-Carson Irrigation District, the Washoe County Water Conservation District and the Sierra Pacific Power Company; The California Cooperative Snow Surveys headed by the Division of Water Resources of the Department of Public Works and including the Pacific Gas and Electric Company and the Nevada Irrigation District, whose employees make surveys of several of the courses used; The U. S. Forest Service and the Division of Irrigation of the U. S. Soil Conservation Service. This latter is the Federal organization which is developing and coordinating the Snow Surveys throughout the Western States. The U. S. Weather Bureau and the Nevada Agricultural Experiment Station also cooperated.

Heavy early winter snows caused the February 1 and March 1 snow surveys to show a relatively high water content on most of the high level courses, but low March precipitation combined with evaporation and early melting resulted in many of the courses, even high level ones, yielding lower actual water content April 1 than March 1.

The April-July actual runoff for the Truckee, Carson, and West Walker Rivers checked well with the forecast, but the rise of Lake Tahoe and runoff of the East Walker considerably exceeded the forecast, the probable explanation being high precipitation in April, exceeding the normal by from two to four inches at several high level U. S. Weather Bureau Stations.

The rise of Tahoe April 1 to high water was 1.56 feet or 92.9% of normal, exceeding the forecast by .3 feet and the East Walker runoff reached nearly 124% of normal, over 23,000 acre-feet, or 32% of normal above the forecast. For the other three rivers the greatest divergence between forecast and actual runoff was for the Truckee River where the runoff was 85.7% of normal or 5.9% of normal above the forecast.

1942

The cooperating agencies were the same as listed for 1941.

The early winter precipitation was high so that February 1 and March 1 snow surveys formed relatively high water content, but light March precipitation caused small increase in high level water content and even a loss in water content as shown by April 1 surveys of several low level courses, due to March melting.

Heavy rain in early and middle of December 1941 must have thoroughly primed the soil and this, combined with very excessive April and May precipitation, caused the April-July runoff to greatly exceed the forecast, which was as usual based on an assumed normal spring precipitation.

Lake Tahoe was high in 1941 and the heavy early winter rise assured above maximum permissible elevation in 1942 if gates were kept closed, so gates were opened in February and the elevation was controlled with the result that the maximum reached was 6,229.01 on July 15, while the limit set in the Truckee River agreement is 6,229.10. Had the gates been kept closed after April 1 the maximum of 6,230.03 would have been reached July 26 which is .58 feet or 34.6% of normal higher than the forecast estimate.

The runoff of the Truckee exclusive of Tahoe, the Carson, and the East and West forks of the Walker all exceeded the forecast by amounts ranging from 13.5% of normal for the West Walker to 43% of normal for the Carson at Fort Churchill.

A study of the April-May precipitation at U. S. Weather Bureau stations nearest to the above basins shows the following: Truckee, Tahoe, and Marlette Lake had 345%, 186% and 208% of normal, respectively; the average percent of normal was 229 for the following ten stations: Sierraville, Bowman Dam, Lake Spaulding, Blue Canyon, Soda Springs, Twin Lakes, Tamarack (Blue Lakes), Lake Eleanor, Hetch Hetchy, and Gem Lake. Quantitatively the excess above normal ranged from 2.84 inches at Tahoe and 2.80 inches at Gem Lake (which is 13 miles southeast of Tioga Pass at altitude 9,000 feet) to 11.66 inches at Blue Canyon and 12.64 at Lake Spaulding. This excess was 6.66 inches at Soda Springs and 8.42 at Tamarack (Blue Lakes).

A reasonable quantitative estimate of the effect of this excess April-May precipitation indicates ample acre-feet to cover the difference between the forecast and the actual results for each of the basins involved.

Such high spring precipitation is very rare in this region.

Recently new low level snow courses near Tahoe were established below Rubicon Peak, near Richardson's, and above Glenbrook. Also, surveyed for the first time in 1942 were courses in Little Valley (between Washoe Valley and Tahoe) and at Poison Flat on the East

Carson River. This latter course was located and surveyed by the Mono National Forest.

II. HUMBOLDT BASIN

During the first year of the biennium, streamflow forecasting in the Humboldt Basin was directed as in previous years by Carl Elges, Assistant Meteorologist of the Nevada Agricultural Experiment Station and U. S. Soil Conservation Service, but since his transfer to active Army service the work has been taken over by Dr. J. E. Church, Meteorologist of the Experiment Station with the assistance of the chairman of the Forecast Committee.

The State and Federal cooperation of earlier years has been continued with ever-expanding participation by the U. S. Forest Service.

The Nevada National Forest has established snow surveys in the Baker River Basin in far eastern Nevada to supplement the service already established on Charleston Mountain at Las Vegas and on Murray Summit for the Steptoe Valley at Ely.

The Toiyabe National Forest has developed a snow survey and forecast system for the upper Reese River Basin at Austin in Central Nevada, and the forecast for the Little Humboldt Basin has been applied also to the Quinn River Basin that shares the Santa Rosa Range and snowfields with the Little Humboldt.

Because of the early disappearance of the snow cover at the original Cave Creek Snow-survey Course at the Ruby Lake National Wildlife Refuge, a new course has been laid out at the same elevation, but better sheltered from the sun.

Safety for snow surveyors has become the leading problem. During the snow-survey trip from Jarbidge to the head of Marys River in late February 1941, an avalanche carried Karl Wilkinson, Ranger in the Humboldt Forest, to his death, while his associate, Dale Rodies, was seriously injured and made his way back to Jarbidge only by superhuman exertion. Two other rangers, L. E. McKenzie in Lamoille Canyon and H. I. Snider in the upper American River Basin, suffered knee and leg injury from the twisting of the ski. Only the presence of companions and, in the latter case, the shelter of a cabin made ultimate escape possible.

The U. S. Forest Service and the Nevada Cooperative Snow Surveys prefer snow-survey parties of three, and the Humboldt Forest requires this number where the trip is overnight. More shelter cabins also are desirable, preferably with two-way radio, a toboggan, and two pairs of web snowshoes, which give better traction for pullers than the ski. The Toiyabe Forest and the Experiment Station have cooperated in the construction of a cabin in the autumn of 1941 at the headwaters of Reese River, and the former has placed a cabin on the lower slopes of Buckskin Mountain in the Santa Rosa Range. The Humboldt Forest and the Experiment Station are rearranging the old shelter cabins and planning an additional cabin on the route from Jarbidge to Upper Marys River Basin in order to avoid the avalanche area and obtain essential snow data.

Owing to the chance escape of an airpilot this last winter in the Sierra Nevada by finding a mountain cabin, the Division of Irrigation

of the U. S. Soil Conservation Service that is directing the Federal-State Snow Surveys, has recommended that each snow shelter-cabin be provided with a map of the route to the nearest habitation, and that a general map showing the location of snow cabins be placed on airplanes.

To reduce injury from falling, test is being made of ski lashings that will promptly release the foot from ski when a spill occurs.

The experiment of conducting two detailed snow surveys in the Humboldt Basin March 1 and April 1 of each year with surveys at key stations January 1, February 1, and May 1, has now become an established custom, for the snow cover of April has a direct effect on the April-July runoff, and excess snow at the lower elevations must be known and carefuly observed for flood menace. Two forecasts are issued, one in early March as to the season's water possibilities, the second in April when probabilities are better known. On the basis of recent experience a supplementary statement of unusual conditions in May will frequently be desirable.

In strong contrast to the years of 1939 and 1940, the years of 1941 and 1942 must be called unusual in their extreme deviation from the forecast. In 1941, the runoff at Palisade was 50% of normal in excess of the snow cover April 1. This was also practically true of Lamoille Creek and Martin Creek in the Little Humboldt Basin. This was due to summer precipitation averaging double normal, lasting practically the entire season from April 1 until winter. The Utah streams likewise exceeded their forecasts, for they were also in the belt of excess rain. The streams in the Sierra Nevada, however, being outside this belt, were unaffected and approximated their forecasts. Nearly half of the excess in the Humboldt was forecasted on May 1, leaving it still 32.6% below the actual. This was inevitable, for there was no means of knowing that the excessive rains would continue.

The flood and March-July runoff of 1942 were almost unprecedented in the record of the Humboldt. The flood at least approached that of 1910 for which only wreckage rather than exact measurements of flow are available. The March-July runoff ranks third during the 39 years of record, the three being 1907 with 685,000 acre-feet (based on Golconda), 1921 with 551,800 acre-feet, and 1942 with 491,450 acre-feet. Only seven seasons had a runoff in excess of 400,000 acre-feet. Of these, two occurred in 1906 and 1907 and four from 1914 to 1922. The other belongs to 1942 after an interval of twenty years of scarcely half the amount.

Like the flood of 1910, that of the present season was due to cold followed by sudden and extreme rise in temperature. The former flood occurred, however, in March after long accumulation of snow, the latter in April with snow apparently only slightly above normal, but with a high water table caused by the continuous heavy rains of the previous season.

The percentage of the snow cover in the upper Humboldt Basin April 1 was 83.9%. The revised forecast of March-July runoff at Palisade was 140%, but the actual was 196.6%, or still 56.6% above final estimate. Much of the latter excess was due again to excess precipitation during April-May of approximately 50% of normal aided by soil moisture that decreased the usual absorption. This

seems to have been true also of Martin Creek in the Little Humboldt Basin.

The experience of the two years is providing more exact knowledge of the effect of excess rain in increasing the runoff and raising the water table and the reverse effect of the latter in reducing absorption and forcing an excess amount of melting snow into the streams. Ultimately all factors except the maximum of the summer precipitation can probably be estimated by May 1.

Meantime stream gaging should be expanded to all of the streams covered by the snow surveys and should be begun as early and continued as late as the streams flow. Only thus can the problems mentioned above be solved. In particular, stream gaging should be inaugurated on the Upper Marys River, where the snowfields are difficult to reach but provide an essential water supply. Fortunately after several years endeavor, a year-round automatic recorder has been established at Chimney dam site on the Little Humboldt Basin above most diversions. The erection and maintenance are by the U. S. Geological Survey (Water Resources Branch) in cooperation with the State Engineer.

The forecasts of streamflow now cover the entire State and contain full details of snow cover and weather during melting. In the forecast of April 1 for the Humboldt Basin, a detailed analysis of the causes of the flood of 1910 and the runoff for 1941 and 1942 is given.

The report of the runoff of the tributaries of the Upper Humboldt River for 1941, now compiled by the chairman, contains also a set of rating curves and new normals based on a 37-year record at Palisade and the percentage relationships of the March-July, April-July, and annual periods of each year.

The new and revised normal of 215,000 acre-feet for March-July will be substituted for the previous normal of 255,620 acre-feet and snow-cover normals will be adjusted to it. The lower normal fortunately corresponds to the normal beneficial use on the Humboldt.

At the suggestion of the editor of Soil Conservation, Dr. Church, originator of streamflow forecasting, has written a preparedness article on "Organized Water." Fortunately the days of confusion and suspicion of 1910 are past and water control has taken their place. Best of all in this year of concentration, water over practically the entire United States is abundant.

CHAPTER XI

LAS VEGAS ARTESIAN BASIN, CLARK COUNTY, NEVADA

In the 1940 Biennial Report of the State Engineer a rather complete discussion was made of the Las Vegas Artesian Basin which is located in and around Las Vegas, Clark County, Nevada. During the past few years the State Engineer's Office has been carrying on investigations in this artesian basin. Starting in 1939 certain wells were designated as "observation wells," and each month pressure readings were made to determine the static head. The results of these investigations indicate a slow decline in the hydrostatic pressure, which would be evidence of a depletion of water in this basin. However, the tests have not been carried forward sufficiently at this time to determine whether or not there is an actual depletion or merely a period depletion.

Following the enactment of the present underground water law in 1939 the State Engineer's office has brought about the repair of many leaky wells in the valley, with a saving of over 2,000,000 gallons of water daily. Also, the owners of many wells that had previously been drilled on which no applications for permission to appropriate water had been filed have made applications and received permits to appropriate water.

Through the cooperation of the United States Forestry Service and the Nevada Cooperative Snow Surveys yearly snow surveys are now being made in the Charleston Mountains. This, coupled with actual measurements made biannually by the State Engineer's office, may enable the State Engineer to determine with reasonable accuracy the amount of water that can be taken out of the basin without causing a depletion. Naturally it will take several years to gather the necessary information before any reasonable determination can be made.

It has become evident that before any real control can be had over the drilling of wells in the Las Vegas Artesian Basin and the prevention of waste from leaky and uncontrolled wells, a licensing law should be enacted for well drillers and provisions made for a full-time artesian well supervisor. The 1939 underground water law provides a method whereby a special tax can be made on all taxable property situated within a prescribed artesian water basin for the payment of the salary of such supervisor. An effort will be made to have the County Commissioners of Clark County levy such a tax.

In the last two years there have been forty-eight new wells drilled in the Las Vegas Artesian Basin on which applications have been made to appropriate water. The large increase of population brought about by the defense projects in and around Las Vegas has resulted in a greatly increased use of water. The new wells that have been drilled have, as far as can be determined by the State Engineer's office, been properly cased and control valves have been installed. During the first week of September 1942, Mr. Edmund Muth, Deputy State Engineer, assisted by Harry Jameson of Las Vegas, made well measurements on approximately fifty of the larger wells in the Las

Vegas Artesian Basin and also made estimates as to the amount of water that was being used from these wells. These measurements indicated that 16,912,503 gallons of water were being used daily from the wells measured. In order to arrive at the total amount of water being used from the Las Vegas Artesian Basin this amount was increased by 10% to cover the many small wells in the valley, bringing the total to 28.7 cubic feet per second of water. This no doubt represents the maximum use from the Las Vegas Artesian Basin during the summer months. Measurements will be made during February to arrive at the winter use and from this an estimate can be made of the annual average use of water. However, it has been tentatively estimated by this office that the average annual use would approximate about 20 cubic feet per second, or approximately 15,000 acre-feet of water yearly.

In order to make of record the measurements of the water flowing from the various wells during the first week of September 1942, we are herewith including this information.

Well No. 6—Anderson (now Brundy)—Stop watch and measuring can. 100 g.p.m. continuous flow or 144,000 gals. per day. Irrigation and domestic.

Well No. 7—Oppedyk—Weir. 0.452 c.f.s. or 203 gals. per min. This well runs open continuously and probably 90% of the water is wasted. 292,320 gals. per day.

Well No. 12—Thebo—Stop watch and measuring can. Well sanded—flows 12.5 g.p.m. continuously. 18,000 gals. per day. This well to be cased and developed this year. Present water supply is insufficient for irrigation.

Well No. 15—Tate—Estimated. 40 g.p.m. Continuous flow of 57,600 gals. per day.

Well No. 17—Filby—Stop watch and measuring can. 50 g.p.m. leak around casing. In addition supplies cabins and trailer camp. Probable use plus waste of 85,000 gals. per day. Could not measure entire flow of water from well.

Well No. 21*—Umbaugh—Stop watch and measuring can. 300 g.p.m. (Not much use this year.)

Well No. 22*—Umbaugh—Estimated. 100 g.p.m. Not much use this year.)

Well No. 23*—Gobeli—Estimated. 30 g.p.m. continuous.

Well No. 389*—Leo Pahor—Stop watch and measuring can. 60 g.p.m. continuous.

Well No. 24—Lindsay—Weir. Flows 640 g.p.m. Only used part time. Has continuous leak around casing of 50 g.p.m. Probably full flow 75% of time for irrigation of pasture. 690,000 gals. per day.

Well No. 25—Sund Well—Estimated. Entire flow leaks around casing. 325 g.p.m, or 468,000 gals. per day. No possible way to control.

Well No. 33—Rockwell—Estimated. 100 g.p.m continuous or 144,000 gals. per day. No control. No way to get an accurate measurement.

Well No. 39—Mildren—Stop watch and measuring can. 75 g.p.m. No use. No leak.

Well No. 43—Oppedyk—Estimated. 35 gals. per min. or 50,400 gals. per day, continuous flow. This flow is entirely wasted as it does not reach irrigation ditch.

Well No. 45—Syndicate No. 4—Estimated. A continuous leak of approximately 10 gals. per min. or 14,400 gals. per day.

Well No. 48—Ellis—Stop watch and measuring can. Flows 120 g.p.m. Used for irrigation and trailer camp. Probably 50% use or 86,400 gals. per day average use.

Well No. 51—Hunt—Stop watch and measuring can. Flows 115 g.p.m. Leaks about 5 g.p.m. continuous. No use. 7,200 gals. per day.

*Estimated daily use of all wells in Section 6 (Highland Park Addition) 200 g.p.m., or 288,000 gals. per day.

Well No. 52—Russell—Stop watch and measuring can. Flows 275 g.p.m. Total flow is used—396,000 gals. per day.

Well No. 76—Art Harris—Estimated. 175 gals. per min. continuous flow. 252,000 gals. per day.

Well No. 80—Wickman—No measurement. This well is used for domestic, dairy, garden, and pasture. Estimated by acreage and use, probably 50 g.p.m. continuous flow or 72,000 gals. per day.

Wells Nos. 81, 82 and 83—Lorenzi—No measurements. From area cultivated probably at least 450 g.p.m. during irrigation season. 648,000 gals. per day.

Well No. 91—Boulder Dam Townsite Company—Stop watch and measuring can. Flows 135 g.p.m. Well closed. Is used on 6 lots. Estimated use 5,000 gals. per day.

Well No. 99—Russell—No measurement possible. About 30 families use this well. Probably 5 acres irrigated. Estimated daily use 250,000 gals. per day.

Well No. 110—Fish Hatchery (Las Vegas). Because of leaks around casing a measurement was made by stop watch and measuring can and the estimated leak was added to the measured quantity. Well flows 225 g.p.m. There is a continuous leak of approximately 50 gals. per min., or 72,000 gals. per day. The well had been closed for some time and the pond was very low.

Well No. 113—Smith—Estimated. Flow of 30 g.p.m. This well is connected to pressure pump and supplies several houses and yards. Probably 10 g.p.m. continuous use or 14,400 gals. per day.

Well No. 115—Golf Course (Las Vegas). Approximately 400 g.p.m. used 8 to 9 months of year. Balance of year normal flow of well is allowed to waste. There was no way of measuring the normal flow. 576,000 gals. per day for greens. If this well is pumped the capacity of the pump wells No. 110 and No. 80 stop flowing.

Well No. 116—Murray—Stop watch and measuring can. 67 g.p.m. continuous flow or 96,480 gals. per day. Used for irrigation and domestic.

Well No. 121—Nickerson—Stop watch and measuring can. 200 g.p.m. continuous flow or 288,000 gals. per day. This water not being used to fullest beneficial use.

Well No. 128—Campbell—Stop watch and measuring can. 75 g.p.m. continuous. 108,000 gals. per day.

Well No. 129—Campbell—Stop watch and measuring can. 15 g.p.m. continuous. 21,600 gals. per day.

Well No. 139—Reed—Stop watch and measuring can. Flows 100 g.p.m. Good control. About 10 g.p.m. allowed to flow continuously. Probably 15,000 gals. per day use. No irrigation at time of measurement.

Well No. 156—Buol—Stop watch and measuring can. 60 g.p.m. A small continuous flow of approximately 10 g.p.m. 14,400 gals. per day. Used for watering horses and pasture.

Well No. 166—Guynn—Stop watch and measuring can. 100 g.p.m. continuous flow or 144,000 gals. per day. Used for irrigation and domestic.

Well No. 195—R. E. Bunker—Weir. 0.21 c.f.s. or 94.5 g.p.m. This well partly closed. Continuous flow 25 g.p.m. or 36,000 gals. per day.

Well No. 199—Haggard—inside flow 60 g.p.m.; outer flow 25 g.p.m. Stop watch and measuring can. Used for domestic and house yard. No irrigation this year. Valves partly open and flowing possibly 15 g.p.m. continuously. Approximately 22,000 gals. per day. This well is affected by pumping at J. B. Ranch well. Pumping of well No. 200 will stop the flow of Well No. 199.

Well No. 203—Filby—Estimated. A continuous flow of 20 g.p.m. or 28,800 gals. per day due to leak.

Well No. 314*—Van Rains.

Well No. 69*—Gladstone Corp.

Well No. 58*—Tomiyasu.

Well No. 343—Smith—Estimated. 300 g.p.m. or 432,000 gals. per day continuous flow. Used for irrigation.

Well No. 373—Wick—Estimated. 50 g.p.m. continuous. 72,000 gals. per day. No beneficial use.

*Approximately 1,350 gals. per min. or 1,944,000 gals. per day.

Well No. 385—Billman—Stop watch and measuring can. 100 gals. per min.

Taylor Ranch Springs. Flow of 275 g.p.m. measured with stop watch and measure at discharge from reservoir. 396,000 gals. per day.

North Las Vegas. 2,000,000 gals. per day.

Las Vegas Land & Water Company for the City of Las Vegas. (This covers the Big Spring and the Little Spring and the following wells. At no time was the total available flow used): Wells Nos. 77, 391, 114, 390, 180, 179, 277, 366, and 367. May, 3,976,627 gals. per day; June, 4,722,003 gals. per day; July, 6,663,503 gals. per day; August, 6,298,400 gals. per day.

Total not including city	10,249,000 gals. per day.
Total July Maximum	16,912,503 gals. per day.
Total add 10%	*18,603,753 gals. per day

*28.709 c.f.s.

WELLS IN THE LAS VEGAS ARTESIAN BASIN AND DATA PERTAINING THERETO

Well No.	Name of Well	Location: Subdivision	Sec.	T.S.	R.E.	Permit No.	Year drilled	Depth	Discharge G.P.M.
1	Taylor, H.	SW¼SE¼	24	20	60	.....	1913	315	N.F.
2	Egglington, L. C.	SE¼NE¼	24	20	60	.....	1910	270+	N.F.
3	Syndicate No. 2	SW¼NW¼	19	20	61	.....	1914	234+	27
4	Syndicate No. 1	NW¼SW¼	19	20	61	.....	1914	.....	20
5	Syndicate No. 5	NW¼NE¼	19	20	61	.....	1914	260+	67
6	Anderson, Geo.	NW¼SW¼	20	20	61	.....	.....	268+	67
7	Oppedyk, R. J.	NW¼SW¼	20	20	61	9389	1930	278	238
8	Frewalt, John	NE¼SW¼	20	20	61	.....	1938	300	9
9	Las Vegas Building & Land Co.	NW¼SE¼	21	20	61	.....	1913	.....	N.F.
10	North Las Vegas	SW¼SE¼	22	20	61	9992	1936	600	100
11	North Las Vegas	SW¼SE¼	22	20	61	9651	1933	250	150
12	Thebo, T. J.	NW¼SW¼	28	20	61	10293	1938	630	75
13	Beam, Frank	NE¼SE¼	33	20	61	.....	1938	600	F.
14	Blackman, A. W.	SW¼SW¼	33	20	61	10035	1936	400	F.
15	Tate, Myrtle	SW¼SW¼	33	20	61	.....	.....	425	63
16	Griffith, Robert	SW¼NE¼	32	20	61	10791	.....	363	N.F.
17	Filby, James	NW¼SE¼	32	20	61	.....	.....	616	265
18	Kidder, M. D.	NW¼SE¼	36	20	60	.....	1925	385	N.F.
19	Hinson, W. N.	SW¼NE¼	6	21	61	10794	.....	326	33
20	Pinjuv, L. M.	SW¼NE¼	6	21	61	10757	1938	292	120
21	Umbaugh, J. H.	SW¼NE¼	6	21	61	10409	1937	394	300
22	Umbaugh, J. H.	SW¼NE¼	6	21	61	10409	.....	224+	100
23	Gobeli, Fred	SE¼NE¼	6	21	61	.....	1928	229	36
24	Lindsay	SE¼NW¼	5	21	61	.....	.....	555	760
25	Sund	NE¼SW¼	5	21	61	.....	1914	585	360
26	Syndicate No. 6	SW¼NW¼	4	21	61	.....	1914	354	2
27	South, J.	SW¼NE¼	4	21	61	.....	1936	341	F.
28	Sweet, W. M.	SE¼SE¼	7	21	61	.....	.....	360	35
29	Deadrich, Henry	SW¼NW¼	18	21	61	.....	1912	292	N.F.
30	Bryant, C. A.	NW¼SE¼	18	21	61	.....	1925	225	N.F.
31	City of Las Vegas	NW¼SE¼	17	21	61	10183	1928	400	F.
32	State Highway	SW¼NW¼	16	21	61	9832	1935	900	50
33	Rockwell, L. H.	SE¼NW¼	15	21	61	.....	.....	386	120
34	Wilbourne	SE¼NW¼	22	21	61	10624	.....	690	F.
35	Armstrong, F. E.	NW¼SW¼	27	21	61	.....	1912	400	11
36	Armstrong, F. E.	NW¼SW¼	27	21	61	.....	1912	346	16
37	Tallackson, G. T.	NW¼NE¼	34	21	61	.....	.....	246	F.
38	Gambill, C. L.	NW¼NW¼	34	21	61	.....	.....	263	19
39	Mildren, F. R.	NE¼NW¼	33	21	61	.....	.....	222	100
40	Ferron, W. E.	SW¼SW¼	28	21	61	.....	.....	103	N.F.
41	Fitzpatrick	SW¼NW¼	4	22	61	.....	.....	355	N.F.
42	Bell, Daisy	NW¼SW¼	9	22	61	.....	.....	127	S.F.
43	Oppedyk, R. J.	NW¼SW¼	20	20	61	9389	1930	318	100
44	Syndicate No. 3	SW¼NW¼	19	20	61	.....	1913	300	25
45	Syndicate No. 4	SE¼NW¼	19	20	61	.....	1914	.....	30
46	North Las Vegas	SW¼SE¼	22	20	61	10181	1936	740	55
47	Craner, S. W.	SE¼NE¼	34	20	61	.....	1913	354	F.
48	Ellis, William	NE¼NW¼	4	21	61	.....	1911	381	100
49	Ellis, William	NW¼NE¼	4	21	61	.....	1910	403	F.
50	Duncan, W. E.	SE¼SE¼	35	20	61	10152	1937	350	50
51	Hunt, et al.	NW¼SW¼	2	21	61	.....	1926	1120	50
52	Russell, Julia	SW¼SE¼	29	20	61	10434	1938	.....	F.
53	Minnette, A. M.	SW¼NW¼	28	21	61	.....	.....	.....	N.F.
54	Dutton	NW¼NE¼	3	21	61	.....	1907	442	75
55	Ronnow, Alice	NE¼NW¼	11	22	61	.....	1909	208	F.
56	Ronnow, Alice	NE¼NW¼	11	22	61	.....	1909	400	F.
57	Tomiyasu, Y.	NE¼SE¼	1	22	61	2303	1911	203	467
58	Tomiyasu, Y.	NE¼SE¼	1	22	61	2303	.....	.....	N.F.
59	Von Tobel, Edward	SE¼SW¼	1	22	61	.....	1910	505	F.
60	Von Tobel, Edward	SE¼SW¼	1	22	61	.....	1912	230	
61	Von Tobel, Edward	SE¼SW¼	1	22	61	.....	1912	335	
62	Miller, John F.	SE¼NW¼	1	22	61	.....	1912	.....	F.
63	Miller, John F.	SE¼NW¼	1	22	61	.....	1912	.....	F.
64	So. Nev. L. & D. Co.	SW¼NW¼	4	21	61	.....	1911	378	N.F.
65	So. Nev. L. & D. Co.	SE¼NW¼	4	21	61	.....	1913	430	F.
66	So. Nev. L. & D. Co.	SE¼NW¼	4	21	61	.....	1911	372	N.F.
67	Paps, Michael	SW¼NW¼	3	21	61	10392	1912	725	P.
68	So. Nev. L. & D. Co.	NW¼NW¼	11	20	60	.....	1911	628	N.F.
69	Gladstone Corp.	SE¼NW¼	10	22	61	4374	1909	325	448
70	Gladstone Corp.	SW¼NE¼	10	22	61	4374	1912	349	F.
71	McCarter, A. F.	NW¼NE¼	36	21	61	.....	1911	500	F.
72	Nagamatsu, Fred	NW¼SE¼	34	21	61	.....	1912	.....	F.
73	Nagamatsu, Fred	SW¼SE¼	34	21	61	.....	1912	.....	F.
74	Nagamatsu, Fred	SW¼SE¼	34	21	61	.....	1912	.....	N.F.
75	Harris, Art	NW¼NE¼	4	21	61	.....	1910	480	225

Well No.	Name of Well	Location: Subdivision	Sec.	T.S.	R.E.	Permit No.	Year drilled	Depth	Discharge G.P.M.
76	Harris, Art	NE¼NW¼	4	21	61	.....	1911	750	F.
77	L. A. & S. L. R. R.	SW¼SW¼	29	20	61	7201	1924	.....	635
78	Beam, F.	NW¼SE¼	35	20	61	.....	.....	475	F.
79	Wengert, A. F.	SE¼NW¼	3	22	61	7593	1925	374	100
80	Wickman, E.	SE¼SW¼	19	20	61	7930	1926	275	F.
81	Sharp, T. E.	NW¼SW¼	29	20	61	10720	.....	375	F.
82	Sharp, T. E.	NW¼SW¼	29	20	61	10721	.....	600	F.
83	Sharp, T. E.	NW¼SW¼	29	20	61	10722	.....	.....	F.
84	Whitehead, S.	SE¼SW¼	1	21	61				
85	Murphy, Roy	NW¼NW¼	26	21	61	9239	.....	610	15
86	Eastland, Van	NW¼NW¼	26	21	61	9239	.....	500	15
87	Bell Telephone	NE¼NW¼	27	21	61	9243	1930	625	F.
88	Boulder Dam Townsite Co.	SE¼SE¼	4	21	61	9323	.....	400	F.
89	Las Vegas Home Blds. Inv.	SE¼SE¼	14	20	61	.....	.....	402	N.F.
90	Kaltenborn, R. J.	SW¼SE¼	2	21	61	10830	.....	398	F.
91	Boulder Dam Townsite Co.*	SW¼NW¼	33	20	61	.....	1925	520	F.
92	Linn, Francis	SW¼SW¼	35	21	61	9498	1931	300	F.
93	Ferguson, F. M.	SE¼SE¼	29	21	61	9516	1931	260	S.F.
94	Ferguson, F. M.	NE¼SE¼	29	21	61	9516	1931	280	N.F.
95	Clark, E. A.	SW¼SE¼	35	20	61	9520	1925	290	F.
96	Humphrey, Guy	NW¼SW¼	23	20	61	9522	.....	310	F.
97	Humphrey, Guy	NW¼SW¼	23	20	61	9522	.....	265	F.
98	Humphrey, Guy	NW¼SW¼	23	20	61	9522	.....	417	F.
99	Russell, Julia	NE¼SE¼	29	20	61	9525	1915	800	310
100	City of Las Vegas	NE¼SW¼	26	20	61	9601	1932	352	F.
101	City of Las Vegas	SW¼SE¼	27	20	61	9602	1932	626	F.
102	City of Las Vegas	NW¼NW¼	26	20	61	9614	.....	347	P.
103	City of Las Vegas	NW¼NW¼	26	20	61	9614	.....	490	P.
104	Clark, E. A.	SW¼SW¼	36	20	61	9652	1932	465	F.
105	Wilson & Mikkelsen	SW¼NE¼	27	20	61	9653	1928	900	F.
106	Dennison, Blanche	SE¼SE¼	2	21	61	9885	.....	500	F.
107	Baxter, Elmer	NE¼NE¼	27	20	61	9914	1932	320	S.F.
108	City of Las Vegas	SW¼SE¼	27	20	61	9939	1936	925	P.
109	City of Las Vegas	NW¼NW¼	30	20	61	8173	1927	322	F.
110	City of Las Vegas	NW¼NW¼	30	20	61	9940	1937	830	225
111	Stafford, John	SE¼NW¼	16	21	61	10013	1936	559	96
112	Weller, Burton	SE¼NW¼	16	21	61	10019	1929	560	50
113	Smith, Wm. R.	SW¼SW¼	20	20	61	10066	1926	300	50
114	Las Vegas Land & Water Co.	NE¼NE¼	31	20	61	10127	1936	802	554
115	City of Las Vegas	NE¼NW¼	30	20	61	10182	1937	680	P. 500
116	Murray, W. D.	NE¼SW¼	20	20	61	10241	.....	386	98
117	Baker, Alpha P.	SW¼SW¼	22	21	61	10243	1933	500	65
118	Honrath, Earl	NE¼SW¼	28	20	61	10245	1940	650	67
119	Moon, William	NW¼SW¼	23	20	61	10260	1938	200	21
120	Gerken, H. D.	SE¼SE¼	32	20	61	10301	1939	407	F.
121	Nickerson, H.	NE¼SW¼	3	22	61	10321	1924	395	176
122	Nickerson, H.	SW¼NE¼	3	22	61	10321	1912	.....	F.
123	Clark County Land Co.	NW¼NW¼	21	21	61	10820	.....	.....	25
124	Clark County Land Co.	NE¼NE¼	21	21	61	10821	.....	.....	F.
125	Pittman, Vail	SW¼SE¼	35	21	61	.....	1925	465	F.
126	Wollman, Agnes	SW¼SW¼	23	21	61	.....	1929	.....	F.
127	Mayfair, Garden	SE¼NW¼	31	21	62	.....	1931	.....	F.
128	Campbell, U. G.	NW¼SE¼	30	21	62	.....	1912	390	150
129	Campbell, U. G.	NW¼SE¼	30	21	62	.....	1912	405	20
130	Parks, Anna	SW¼NE¼	19	21	62	.....	1934	.....	10
131	Sheppard, J.	SE¼NW¼	31	21	62	.....	1911	250	F.
132	Sheppard, J.	SW¼NE¼	31	21	62	.....	.....	.....	F.
133	Matzdorf, Martha	SW¼SW¼	29	21	62	.....	1912	1165	3
134	Matzdorf, Martha	SW¼SW¼	29	21	62	.....	1912	404	3
135	Bailey	SE¼SW¼	36	21	61	.....	.....	.....	5
136	Heaton, C. A.	NW¼NW¼	6	22	62	.....	.....	.....	3
137	Heaton, C. A.	NE¼NW¼	6	22	62	.....	1912	.....	3
138	Campbell, T. A.	SW¼SE¼	9	21	61	10813	.....	530	F.
139	Reed, Harry F.	NW¼SW¼	2	22	61	.....	.....	600	85.5
140	Smoke	SW¼SE¼	13	20	60	.....	1915	.....	P.
141	Taylor, H.	NE¼NW¼	24	20	60	.....	1924	315	N.F.
142	McIntyre	NW¼NW¼	33	21	61	.....	1931	351	P.
143	Beam, F.	NW¼NE¼	8	22	61	.....	1931	115	S.W.
144	Engler	SW¼SW¼	35	19	60	.....	.....	.....	N.F.
145	Williams, D.	SW¼SW¼	3	22	61	.....	1935	575	N.F.
146	McWilliams	NW¼NE¼	1	21	60	.....	1930	508	N.F.
147	Stocker, C.	SW¼SE¼	22	20	61	.....	.....	169	F.
148	Umbaugh, Mrs. J. H.	SW¼NE¼	6	21	61	10409	.....	274	F.
149	Beckwith, Clarence	NE¼SW¼	25	21	61	.....	.....	.....	F.
150	Leavitt, L. P.	SW¼NE¼	2	22	61	10367	1940	.....	F.
151	Higgins, Earl	SW¼NE¼	6	21	61	.....	.....	259	F.
152	Woodward, J. W.	SE¼SE¼	22	20	61	.....	.....	.....	F.
153	Younquist	.....	....	....	....	.....	.....	425	

Well No.	Name of Well	Location: Subdivision	Sec.	T.S.	R.E.	Permit No.	Year drilled	Depth	Discharge G.P.M.
154	Rose Garden Add.	SE¼SE¼	22	20	61	.....	1931	415	F.
155	Kimball & Williams	SW¼NE¼	7	21	61	.....	.....	375	F.
156	Buol, Frank	SW¼NE¼	22	20	61	.....	1932	265	100
157	Stewart, Mina	SE¼NE¼	27	20	61	.....	.....	265	F.
158	State Highway	SE¼NE¼	27	20	61	.....	.....	270	N.F.
159	L. A. & S. L. R. R.	SW¼NW¼	34	20	61	.....	.....	.....	F.
160	Rose, Morris	NW¼SW¼	21	21	61	.....	.....	520	15
161	Clancy	SE¼SE¼	22	20	61	.....	.....	369	5
162	Maracci, C.	SE¼SE¼	22	20	61	.....	.....	415	5
163	Bryant, C. A.	NE¼NE¼	34	20	61	.....	1925	.....	F.
164	Paris Auto Court	SW¼SW¼	23	20	61	.....	.....	180	P.
165	Dimmick	SE¼SE¼	22	20	61	.....	.....	210	F.
166	Guynn	NE¼SW¼	20	20	61	.....	1932	347	F.
167	Five Point Serv. Sta.	SE¼SE¼	22	20	61	.....	.....	165	F.
168	Von Tobel	SE¼SW¼	1	22	61	.....	1936	.....	25
169	Indian Reservation	NW¼NE¼	27	20	61	.....	.....	375	F.
170	Owen, Charles	SE¼SE¼	22	20	61	.....	.....	.....	N.F.
171	Masik & Hennon	NE¼SE¼	29	20	61	.....	.....	.....	F.
172	Paps, Michael	SW¼NW¼	3	21	61	10392	.....	810	P.
173	Case, Harold	SE¼NE¼	27	20	61	.....	.....	280	31.5
174	Clough, Richard	SW¼NE¼	34	20	61	10391	1940	570	31
175	Leavitt, L. P.	NW¼NE¼	2	22	61	.....	1912	290	
176	Kisiwor, Martin	SW¼NE¼	27	21	61	.....	1912	230	S.F.
177	Las Vegas Irr. F.L.Co.	SW¼SW¼	33	21	61	.....	1912	550	N.F.
178	Rose, Morris	NW¼SW¼	3	21	61	10643	1939	512	S.F.
179	Las Vegas Land & Water Co.	SE¼SE¼	30	20	61	10458	1940	.....	958
180	Las Vegas Land & Water Co.	NE¼SE¼	27	20	61	10439	1939	323	45
181	Saunders, R. B.	NE¼NE¼	27	20	61	10465	1940	200	16
182	Goumond, P. J.	NW¼SE¼	34	20	61	10466	1940	638	66
183	Woodland Park	SW¼SW¼	33	20	61	.....	1912	360	F.
184	Gratz, C.	NW¼NE¼	21	20	61	.....	1912	301	S.F.
185	Oppedyk	SE¼SE¼	21	20	61	.....	1912	490	N.F.
186	Oppedyk	SE¼SE¼	21	20	61	.....	1912	410	N.F.
187	Russell, Doc.	NE¼SE¼	22	20	61	.....	1931	.....	P.
188	Cox, W.	SE¼NW¼	23	20	61	.....	1934	185	S.F.
189	Coleman, J.	NE¼SW¼	23	20	61	.....	1937	400	P.
190	Bruno, Tony	NW¼SW¼	23	20	61	.....	1936	210	P.
191	Sakai, H.	SW¼SE¼	22	20	61	.....	.....	.....	P.
192	Stevens, Mrs.	SE¼SW¼	22	20	61	.....	1938	812	P.
193	North Las Vegas	SW¼SE¼	22	20	61	.....	1939	.....	F.
194	North Las Vegas	SW¼SE¼	22	20	61	.....	1939	.....	F.
195	Bunker, Robert	NE¼SW¼	28	20	61	10474	1932	820	F.
196	Hermenget, A.	NW¼SE¼	28	20	61	.....	.....	390	F.
197	Hutchinson, A.	NW¼SE¼	28	20	61	.....	.....	.....	F.
198	Sterner & Allen	NW¼SE¼	28	20	61	.....	1920	420	F.
199	Haggard, J. A.	NE¼SE¼	28	20	61	.....	1916	805	100
200	Haggard, J. A.	NE¼SE¼	28	20	61	.....	1928	320	100
201	Pico & Perry	SE¼SE¼	32	20	61	.....	1932	.....	50
202	County Hospital	SW¼SW¼	33	20	61	.....	.....	.....	N.F.
203	Filby, James	NW¼SW¼	33	20	61	.....	1913	400	87
204	Filby, James	NW¼SW¼	33	20	61	.....	1912	426	60
205	Allen, E. H.	SW¼SW¼	33	20	61	10471	1938	400	F.
206	Strong, Ed.	SW¼SW¼	33	20	61	.....	1938	226	F.
207	Ullom	SE¼SW¼	33	20	61	.....	1912	401	S.F.
208	Parks, E.	SE¼NW¼	16	20	61	.....	1930	.....	S.F.
209	Oppedyk Dairy	SW¼NE¼	27	20	61	.....	1934	.....	F.
210	Pat's Patio	SW¼SE¼	35	20	61	.....	1931	412	F.
211	Richardson, Vance	SE¼NE¼	27	20	61	.....	.....	.....	F.
212	Mankiewicz, M.	SE¼SW¼	22	20	61	.....	.....	.....	P.
213	State Highway	SE¼NE¼	27	20	61	.....	1912	.....	N.F.
214	McLallen, W.	SW¼SE¼	4	21	61	.....	1912	382	20
215	Blanding	NW¼NE¼	4	21	61	.....	1913	750	F.
216	Blanding	NW¼NE¼	4	21	61	.....	.....	.....	N.F.
217	Hefner, G.	NW¼NW¼	4	21	61	.....	.....	.....	135
218	Hefner, G.	NW¼NW¼	4	21	61	.....	.....	710	S.F.
219	Fisher, J. C.	NW¼NW¼	1	21	61	.....	.....	.....	30
220	City of Las Vegas	NW¼SE¼	17	21	61	.....	.....	.....	125
221	Bryant, C. A.	NW¼SE¼	18	21	61	.....	.....	.....	N.F.
222	Woodward	NE¼SE¼	17	21	61	.....	.....	.....	25
223	Gould, C.	NW¼NW¼	27	21	61	.....	1931	360	17
224	Bell, P. W.	SW¼SE¼	27	21	61	.....	.....	.....	F.
225	Griffith, Edna	NW¼NE¼	2	22	61	.....	.....	200	S.F.
226	Lightfoot, L.	NW¼NE¼	2	22	61	.....	1924	200	F.
227	Sweeney, M. M.	NE¼NW¼	2	22	61	.....	.....	.....	20
228	Smythe	NW¼NW¼	2	22	61	.....	1910	.....	1
229	Mundy	SE¼NE¼	34	20	61	.....	1913	.....	F.
230	Keeler, Tom	NE¼NE¼	34	20	61	.....	1926	600	F.
231	Garehime, Jake	SW¼NW¼	35	20	61	.....	.....	.....	F.
232	Ladd, James	SE¼NE¼	34	20	61	.....	1912	370	F.
233	Ladd, James	NW¼SW¼	35	20	61	.....	1912	373	F.
234	Scott, H. J.	NE¼NE¼	1	21	62	10623	.....	.....	P.

Well No.	Name of Well	Location: Subdivision	Sec.	T.S.	R.E.	Permit No.	Year drilled	Depth	Discharge G.P.M.
235	Home Auto Court	NE¼NW¼	3	21	61	.....	1926	407	F.
236	Fulcher, James	NE¼NW¼	3	21	61	.....	1927	400	P.
237	Larson, Sam	NE¼NW¼	3	21	61	.....	1925	403	F.
238	Park, Dr.	NW¼NE¼	3	21	61	.....	1912	807	F.
239	Dutton	NW¼NE¼	3	21	61	.....	.....	.....	F.
240	Stevenson, Dr. Gladys	SE¼SE¼	4	21	61	.....	1939	350	S.F.
241	Tower Auto Court	SE¼SE¼	4	21	61	.....	1934	600	F.
242	91-Club	NE¼NW¼	16	21	61	10497	1930	600	80
243	Miller & Smith	NW¼SW¼	16	21	61	.....	.....	700	F.
244	Wells, T. A.	NW¼SW¼	16	21	61	.....	.....	.....	N.F.
245	Wells, T. A.	NW¼SW¼	16	21	61	.....	.....	700	F.
246	Weisberger, Jack	NW¼SW¼	16	21	61	10792	1936	700	F.
247	Munson, F.	SW¼SE¼	17	21	61	.....	1938	540	95
248	Pickwick Oil Co.	NE¼NE¼	17	20	61	.....	1931	500	Dry
249	Mildren, Dr.	SW¼NW¼	33	21	61	.....	.....	.....	S.F.
250	Gallagher, J.	SE¼NE¼	3	22	61	.....	.....	.....	33.5
251	Johnson, Rufus	SW¼SE¼	3	22	61	.....	.....	.....	S.F.
252	Fox, J.	NE¼NE¼	10	22	61	.....	1912	.....	25
253	Fox, J.	NE¼NE¼	10	22	61	.....	1912	.....	N.F.
254	Zaugg, A.	SE¼NE¼	10	22	61	.....	.....	.....	N.F.
255	Zaugg, A.	SE¼NE¼	10	22	61	.....	.....	.....	N.F.
256	Zaugg, A.	SE¼NE¼	10	22	61	.....	.....	.....	F.
257	Whitney, R. E.	NE¼SE¼	10	22	61	.....	.....	.....	13.5
258	Whitney, R. E.	NE¼SE¼	10	22	61	.....	.....	.....	F.
259	Whitney, R. E.	NE¼SE¼	10	22	61	.....	.....	.....	F.
260	Clark-Ronnow	SE¼SW¼	2	22	61	.....	1912	.....	S.F.
261	Clark-Ronnow	NE¼NW¼	11	22	61	.....	1912	.....	N.F.
262	Clark-Ronnow	SE¼NW¼	11	22	61	.....	1912	.....	25
263	Clark-Ronnow	SE¼NW¼	11	22	61	.....	1912	.....	50
264	Clark-Ronnow	SE¼NW¼	11	22	61	.....	1912	.....	N.F.
265	McNamee, Frank	SE¼SE¼	2	22	61	.....	.....	.....	S.F.
266	Sakai, T.	NW¼NW¼	12	22	61	.....	.....	.....	20
267	Von Tobel & Beckley	SE¼SW¼	1	22	61	.....	1914	536	S.F.
268	Von Tobel & Beckley	SW¼SE¼	1	22	61	.....	1911	503	60
269	Miller, John F.	SW¼NW¼	1	22	61	.....	1938	225	20
270	Miller, John F.	SW¼NW¼	1	22	61	.....	1912	455	F.
271	Miller, John F.	SW¼NW¼	1	22	61	.....	1912	455	N.F.
272	Miller, John F.	SW¼NW¼	1	22	61	.....	1912	.....	F.
273	Miller, John F.	NW¼SW¼	1	22	61	.....	1912	1050	F.
274	Miller, John F.	NW¼SW¼	1	22	61	.....	1912	340	N.F.
275	Miller, John F.	NW¼SW¼	1	22	61	.....	1912	.....	F.
276	Goodwin, Wm.	SE¼SW¼	27	20	61	.....	1924	357	S.F.
277	Las Vegas Land & Water Co.	SE¼NE¼	31	20	61	10508	1940	801	603
278	Hampton, R.	SW¼SW¼	25	20	61	.....	1932	530	30
279	Hampton, Davis & Dial.	SW¼SW¼	25	20	61	.....	1940	330	15
280	Haller, Chas.	NW¼NW¼	36	20	61	.....	1934	320	40
281	Parks, Eugene	SE¼NW¼	36	20	61	.....	.....	.....	S.F.
282	Polman, W.	SE¼NW¼	36	20	61	.....	.....	.....	3
283	Barbee, S.	NE¼NW¼	7	21	62	10709	1929	425	N.F.
284	Murphy, G. H.	NE¼NW¼	7	21	62	.....	.....	180	N.F.
285	Mather, R. L.	NE¼NW¼	7	21	62	.....	.....	700	N.F.
286	McLaurine, Iva	NE¼NW¼	7	21	62	.....	1929	225	S.F.
287	Finlayson, M.	NE¼NW¼	7	21	62	.....	1926	.....	S.F.
288	Sears, Buck	NE¼NW¼	7	21	62	.....	.....	325	S.F.
289	Lisle, Jack	NE¼SE¼	12	21	61	.....	1939	310	25
290	Maas, Elsie	SW¼SE¼	12	21	61	.....	1937	284	25
291	Creighton, F. C.	SW¼SE¼	12	21	61	.....	1937	284	50
292	Lisle, John	SE¼NW¼	13	21	61	.....	1939	260	75
293	Gribble, C.	NE¼NE¼	28	21	62	.....	.....	420	S.F.
294	Bunch, J. H.	SE¼NE¼	28	21	62	.....	1931	570	N.F.
295	Dolan, Geo.	SE¼SE¼	21	21	62	.....	.....	.....	S.F.
296	Snider, R. M.	NW¼SW¼	27	21	62	.....	.....	400	P.
297	Clark & Ronnow	SW¼NE¼	28	21	62	.....	.....	.....	S.F.
298	Campbell, U. G.	NW¼SE¼	30	21	62	.....	.....	.....	S.F.
299	Campbell, U. G.	NW¼SE¼	30	21	62	.....	.....	.....	S.F.
300	Campbell, U. G.	NW¼SE¼	30	21	62	.....	.....	.....	4
301	Matzdorf, M.	SW¼NW¼	29	21	62	.....	1935	.....	F.
302	Stevens, Una	SW¼SE¼	30	21	62	.....	1910	415	S.F.
303	Jefferson, R. B.	NW¼NW¼	28	20	61	.....	1912	690	60
304	Jefferson, R. B.	SW¼NW¼	28	20	61	.....	.....	.....	N.F.
305	Owens, B.	SE¼NW¼	21	20	61	.....	1925	525	43
306	Francis, Floyd	SE¼NW¼	21	20	61	.....	1925	500	N.F.
307	Hizar, A. E.	SE¼SW¼	17	20	61	.....	.....	.....	F.
308	Hizar, A. E.	SE¼SW¼	17	20	61	.....	.....	.....	F.
309	Taylor Est. Co.	NE¼NE¼	22	20	61	.....	1912	418	N.F.
310	Taylor Est. Co.	SW¼SE¼	15	20	61	.....	1925	500	N.F.
311	Taylor Est. Co.	SW¼SE¼	15	20	61	.....	1925	805	F.
312	Taylor Est. Co.	SW¼SE¼	15	20	61	.....	.....	.....	F.
313	Taylor Est. Co.	SW¼SE¼	15	20	61	.....	1925	935	N.F.
314	Rains, Van	NE¼SE¼	3	20	61	.....	1933	242	450
315	Simpson, A. L.	SE¼NE¼	3	20	61	.....	1938	340	5
316	Stewart, Sumner V.	SW¼NE¼	3	20	61	.....	1934	300	S.F.

Well No.	Name of Well	Location: Subdivision	Sec.	T.S.	R.E.	Permit No.	Year drilled	Depth	Discharge G.P.M.
317	Stewart, Sumner V.	SW¼NE¼	3	20	61	.....	1934	.....	N.F.
318	Craig, Geo.	SE¼NE¼	4	20	61	.....	1912	900	P.
319	Simons, P. A.	NW¼NE¼	27	20	61	.....	1931	310	N.F.
320	Young, P. P.	SW¼NE¼	27	20	61	.....	.....	320	N.F.
321	Remick, Fred	NE¼NW¼	27	20	61	.....	.....	.....	F.
322	Kelly, M.	NE¼SW¼	27	20	61	.....	1924	283	S.F.
323	Masik, J.	NW¼SE¼	20	20	61	.....	1936	325	15
324	Masik, J.	NW¼SE¼	20	20	61	.....	.....	.....	N.F.
325	Clark, E. A.	SW¼SW¼	36	20	61	10503	1940	637	45
326	Craner, S. W.	SE¼NE¼	34	20	61	.....	.....	.....	F.
327	Craner, S. W.	SE¼NE¼	34	20	61	.....	.....	.....	F.
328	Jones & Blaine	SE¼SW¼	33	20	61	.....	1940	.....	F.
329	Ridgeview Est. Co.	SE¼SW¼	10	21	61	.....	1912	.....	2
330	Nevada Hotel Co.	NW¼NW¼	11	21	61	10520	1940	650	43
331	Boulder Dam Hotel Corp.	NE¼NW¼	17	21	62	.....	.....	400	2.5
332	Bauer, A.	NE¼NE¼	29	20	61	.....	.....	.....	F.
333	Morgan, R. L.	NE¼SW¼	27	20	61	.....	1924	472	N.F.
334	Reeder	NE¼SW¼	27	20	61	.....	1922	385	N.F.
335	Baldwin, Mrs.	NW¼SW¼	27	20	61	.....	.....	.....	N.F.
336	Caskey, Clyde	NW¼SW¼	27	20	61	.....	.....	.....	N.F.
337	Winterwood Ranch	NE¼NE¼	4	21	62	.....	1912	.....	N.F.
338	Winterwood Ranch	NE¼NE¼	4	21	62	.....	1912	.....	N.F.
339	Winterwood Ranch	NE¼NW¼	3	21	62	.....	1912	.....	N.F.
340	Winterwood Ranch	NE¼NW¼	3	21	62	.....	1912	.....	N.F.
341	Hull, Thos. E.	NE¼NE¼	9	21	61	10553	1940	.....	F.
342	Bunch, J. H.	SW¼NW¼	27	21	62	10559	1940	.....	F.
343	Smith, Wm. R.	SW¼SW¼	20	20	61	10066	1940	300	200
344	Dio Dato, F.	NE¼NW¼	16	21	61	10528	1940	552	F.
345	Wengert, Helen	NW¼NW¼	26	21	61	10573	1940	.....	F.
346	Kuffer, Adrian	SE¼SE¼	32	20	61	10574	1940	410	F.
347	Michelas, T.	NE¼SE¼	4	21	61	10582	1940	810	F.
348	Whitehall Lodge Corp.	NE¼SW¼	35	20	61	10591			
349	Corradetti	NE¼NW¼	3	21	61				
350	Foster, C. A.	NW¼SW¼	1	22	62	10602	1940	465	N.F.
351	Gaymyers	SE¼NE¼	27	20	61	.....	1940		
352	Leadbetter	NE¼NW¼	11	22	61	.....	1940		
353	Tenesch, Max	NE¼SW¼	34	20	61	10717	1941	.....	F.
354	Coram, E. B.	SE¼SE¼	19	20	61	10630	1941	280	F.
355	Baker	SW¼NW¼	27	21	62	10635	1941	450	S.F.
356	Wilson & Mikkelsen	NW¼SW¼	3	21	61	10660	1941	600	F.
357	Perozzi	NE¼SE¼	29	20	61	10669	1941	430	30
358	Arnold, Arthur	SE¼SW¼	22	20	61	10670	1942		
359	Bunker, E. & J.	SE¼SW¼	28	20	61	10675	1941	360–375	F.
360	Bunker, Eloise	SE¼SW¼	20	20	61	10679	1941	.....	F.
361	Edmonds, J. & A.	SW¼NE¼	6	21	61	10600	1941	288	60
362	Clark, E. A.	NE¼SW¼	35	20	61	10097	1941	470	75
363	Stocker, H. & G.	NW¼SW¼	35	20	61	10702	1941	.....	F.
364	Lawson, S.	SE¼NE¼	9	22	61	10704			
365	Buck, Dalton	NW¼NW¼	21	22	61	10705			
366	Las Vegas Land & Water Co.	SE¼SE¼	30	20	61	10706	1942	489	360
367	Las Vegas Land & Water Co.	NE¼NE¼	30	20	61	10707	1942	500	320
368	Beam, Estella	SE¼SE¼	35	20	61	10713	1941	418	F.
369	Lawson, A. & V.	SW¼SW¼	26	21	61	10716			
370	Hull, Thos. E.	NE¼NE¼	9	21	61	10718	1941	777	F.
371	Aeroville Corp.	SW¼NE¼	4	20	62	10734	1942		
372	Coffman, R. A.	SW¼NW¼	16	21	61	10740			
373	Wick, H.	SE¼SE¼	3	22	61	10745	1941	.....	F.
374	Lawson, Florence	NW¼SW¼	9	22	61	10750			
375	Sweeney, M.	NW¼NW¼	16	22	61	10751			
376	Henderson, C. B.	NE¼NE¼	1	21	62	10753			
377	McAfee, Guy	SW¼NE¼	9	21	61	10754	1942	550	F.
378	Somerville, F. & W. L.	SW¼NW¼	16	21	61	10758			
379	Mikilich, S.	SW¼NW¼	6	21	61	10761	1942	.....	F.
380	Miller, E. J.	NW¼SW¼	29	20	61	10781			
381	Pisetta, L.	NW¼SW¼	20	20	61	10784	1942	.....	F.
382	Cram, Roy	SW¼SE¼	9	22	62	10785			
383	Drew, A. L.	SW¼SW¼	33	20	61	10786	1942	.....	F.
384	Dixon, Herbert	....	....	....	....	10795			
385	Billman, L.	NW¼SW¼	21	21	62	10802	1942	.....	100
386	Opaco Lumber & Realty Co.	NE¼NE¼	4	21	61	10818	1942	.....	F.
387	Wiener, Louis, Jr.	NW¼NW¼	1	21	62	10828	1942	.....	F.
388	Sigurdson, John	NE¼NE¼	34	20	62	10725	1941	.....	F.

*Four applications on this well. No permits issued as of July 1, 1942.

N.F.—Nonflowing; no discharge under artesian pressure.
F.—Flowing, but no measurement.
S.F.—Small flow.
P.—Pumping.
S.W.—Surface water.

CHAPTER XII

Ground Water Possibilities Near Panaca, Lincoln County, Nevada*

By HARRY E. WHEELER, *Associate Professor of Geology, University of Nevada*

INTRODUCTION

LOCATION AND AREA

The area discussed in this report lies entirely within the Water Facilities Area No. 3, or the Meadow Valley Sub-Area, in northeastern Lincoln County, Nevada. Specific estimates of ground water possibilities are made only for portions of sections 28 and 33, Township 1 South, Range 68 East, and sections 4 and 9, Township 2 South, Range 68 East. These sections lie on the eastern margin of Meadow Valley between the town of Panaca on the south and the western end of Condor Canyon on the north. This area may also be described as constituting the western flank of the Ely Range at its southern terminus where elevated areas of Cambrian limestone and dolomite are sometimes referred to as the "Panaca Hills." Less specific mention is made of the entire Panaca basin and all the upstream drainage of Meadow Valley Wash and its tributary valleys.

PURPOSE OF INVESTIGATION

The immediate purpose of the examination upon which this report is based was to estimate the probable yield of the Panaca Irrigation Company well recently drilled to a depth of 630 feet in lacustrian clays at the north edge of the Panaca townsite, and to recommend one or more drilling sites of other location in the event that the Panaca well should yield appreciably less than the desired one-half second-foot of water.

A brief examination was made of the log, cuttings, and history of the Lafe Mathews well with the view of determining the cause of its loss of yield.

The area below the mouth of Condor Canyon was visited for the purpose of determining the most desirable drilling site for the proposed Ronnow Brothers well.

And finally, consideration was given to the geological structure of the region as a whole for an evaluation of the probabilities of developing artesian water in the Meadow Valley area.

GEOLOGY

CAMBRIAN LIMESTONE AND DOLOMITE

The formation of Cambrian age in southeastern Nevada are entirely of marine origin. These rocks which consist of conglomerates, sandstones, shales, limestones, and dolomites, have accumulated to an

*Report submitted to Mr. George Hardman, Reno office, U. S. Soil Conservation Service, November 28, 1941, under the title "Geologic Report on the Ground Water Possibilities of a Part of Meadow Valley Sub-Area of Lower Virgin River Water Facilities Area, Lincoln County, Nevada."

NOTE—The plates referred to in this report will be sent free of charge upon request to Mr. A. M. Smith, State Engineer, Carson City, Nevada. This action is taken in view of the war program and the necessary economies entailed.

aggregate thickness of about 10,000 feet. Each of the eight formations is widespread and uniform in its original geographic distribution. They are generally distinctly bedded and cut by numerous joints and faults. Except for the shale formations, the entire sequence is highly pervious in consequence of the open character of the bedding planes and zones of brecciation along faults.

The 3,000 foot sequence exposed in the Panaca area (Plate II) contains only one impervious shale member, and it is less than 15 feet thick. (Wheeler, 1940, pp. 33, 38, 39.) This shale could have only a local impounding effect because of the presence of numerous faults with more than 15 feet of stratigraphic displacement. The thicker Pioche and Chisholm shales are nowhere exposed in the Panaca Hills.

Thus the Cambrian rocks of the Panaca region consist almost exclusively of limestone and dolomite, and may be regarded generally as of medium porosity and high permeability. This conclusion is further indicated by the flat character of the water table in nearby regions where sufficient data is available to give its relief.

TERTIARY VOLCANICS

Through the eastern four-fifths of Condor Canyon and in the higher hills northeast of Panaca, more than 5,000 feet of lavas and volcanic tuffs lie unconformably upon the Cambrian limestones and dolomites. The lavas vary in composition, according to Westgate (1932), from extremely silicic varieties (rhyolite and latite) to basic types (basalt), though most of the flows are of intermediate composition (andesite and dacite). The individual flows vary in thickness from a few feet to several hundred. Most of the lavas are interbedded with volcanic ash and tuff beds with similar variations in thickness.

Most of the lavas are well-jointed, and therefore pervious. The intercalated tuffs, however, are mostly fine-textured, and would naturally be rather impervious to the flow of water. Because of these impervious intercalations the volcanics, except locally, are regarded as poor in water-bearing qualities.

These volcanic rocks are questionably assigned to the early part of the Tertiary period by Westgate (1932).

PANACA LAKE BEDS

Following the accumulation of the Tertiary volcanic series, the region was subjected to severe deformation in the form of intense faulting and broad folding. This faulting, with north-south trends and with displacements ranging from a few feet to thousands of feet, largely accounts for the present distribution of rocks in the various ranges of the region. This was followed by a period of minor east-west faulting. All this deformation was post-volcanic, but earlier than a period of basin-range faulting which was responsible for the present mountain ranges of the region and the intermountain valleys.

A series of these interconnected valleys, after the partial erosion of the adjacent ranges, was occupied by a great lake, the basin of which was gradually filled with sediment. These lake beds, which are extensively excavated and exposed only in Meadow Valley and vicinity, are known as the Panaca formation.

The sediments are mostly fine-textured clays and fine silts of

volcanic origin, but grade into strata with sand and gravel intercalations near the shore lines. The formation as a whole is to be regarded as impervious to appreciable flow of subsurface water, though locally, the more coarsely detrital sediment may constitute small equifers. As yet these are untested, however.

The character of the pre-Panaca mantle is unknown except by inference. This problem will be discussed briefly on a later page under "Artesian Water Possibilities."

QUATERNARY DEPOSITS

The principal deposits of Quaternary age in the Panaca region are the post-Panaca valley fill and alluvial fans. The fans of the immediate area under discussion are too small to be of value as water bearers. The character of the valley fill varies from coarse gravel to fine silt and clay, depending upon the local conditions of deposition. Most of the Meadow Valley flood-plain deposits are of fine texture near the top and more coarsely detrital at depth. The gravels and sands, where present, are both porous and pervious.

GROUND WATER

PANACA IRRIGATION COMPANY WELL

The Panaca Irrigation Company has recently drilled a well in the low saddle between two buttes at the northern edge of the Panaca townsite. The well penetrates the Panaca formation to a depth of 630 feet. The water table was encountered at 47 feet.

Following is the driller's log:

0 feet to 335 feet—Clay.
335 feet to 340 feet—Clay with rock seams.
340 feet to 370 feet—Clay with porphyry.
370 feet to 400 feet—Porphyry and clay.
400 feet to 435 feet—Clay and porphyry.
435 feet to 485 feet—Clay with little porphyry.
485 feet to 490 feet—Porphyry with clay.
490 feet to 630 feet—Clay.

The bailer products seen at the well are almost entirely of fine texture, though some limestone cuttings were observed. Examination of a sample of "porphyry" cuttings reveals limestone and dolomite pebbles with a few volcanic fragments. The writer assumes, therefore, that all the reported "porphyry" is mostly carbonate rock. This, of course, is to be expected in view of the close proximity of the Cambrian limestone and dolomites.

The log indicates that the well penetrates 155 feet of pebble-bearing strata (between 335 feet and 490 feet). The fact that this zone is underlain by at least 140 feet of clay suggests that the normal lacustrian sedimentation (clay sedimentation) was interrupted during a period when relatively strong currents prevailed. Such a change would most likely involve a temporary lowering of the lake level, and the local resumption of sub-aerial deposition. Although under such conditions, most of the resultant coarsely detrital sediment might still have a matrix of fine material, and therefore be impervious. However, in view of the appreciable thickness of these pebble-bearing

beds, it is the writer's opinion that the well should not be abandoned without a test. The zone between 335 feet and 490 feet may carry one or more sufficiently widespread pervious horizons to yield more than 100 gallons per minute without excessive drawdown.

PROPOSED DRILLING SITES FOR PANACA IRRIGATION COMPANY

CALLAWAY-MODENA WASH

In the event that the present well of the Panaca Irrigation Company is abandoned, one or more additional drilling sites where water may be developed at shallow depth may be desired. Of the two localities recommended, the Callaway-Modena Wash area at the east edge of the Panaca townsite is closer to the proposed water-works system, and may therefore be the most desirable choice of the two.

The highly porous and pervious Quaternary sands and gravels of Callaway and Modena Washes are deposited in channels cut in the relatively impervious clays of the Panaca formation. Thus there should be little seepage loss from the wash deposits. Callaway Wash, the larger of the two drains, rises nearly ten miles eastward at the summit of the unnamed range near the Nevada-Utah boundary. The piñon vegetation of the higher reaches of the drainage area indicates probable annual precipitation of 12 to 15 inches. The deposits at the lower end of the wash should yield a limited supply from shallow depth quite indefinitely. This supply should be somewhat augmented from the smaller Modena wash on the south.

To avoid any possibility of contamination from the cemetery, the eastern edge of the townsite is recommended at a point about 600 feet to 700 feet north of the Modena road.

FAULT ZONE DRILLING SITE

As stated on a previous page in this report, the Cambrian limestones and dolomites of the district are to be regarded as of medium porosity and high permeability. The water table within these rocks should stand at approximately the same level as in the adjacent Meadow Valley.

One of the most severely brecciated and sheared zones of the exposed Cambrian rocks of the district occurs along the south side of the limestone ridge in the NE¼ of Sec. 4, T. 2 S., R. 68 E. Here the faults of a broad, east-west fault zone in the NW¼ of Sec. 3 are gradually converging to form a zone of shearing and brecciation. (See Plates II and III). In addition, the broad breccia zone of a N.N.E.–S.S.W. fault meets and is offset by these east-west faults. Since the N.N.E.–S.S.W. fault has an average westerly dip of 45 degrees, the drilling site should be located westerly from it at a distance equal to the desired depth of its intersection. The estimated depth to the water table in this vicinity is between 75 and 100 feet. Since a common intersection of both fault zones and the drill hole is desired below the water table, the suggested drilling site is located at the north edge of the east-west breccia zone and about 150 feet west of the exposure of the N.N.E.—S.S.W. fault zone. The location is marked by a one-foot boulder of iron oxide-stained limestone about three or four feet north of the secondary road.

Highly fractured limestone should be encountered at this locality

to the desired depth of about 150 feet. The chances of developing a yield of one-half second-foot or more at this locality are regarded as good.

The question may arise as to whether the development of a well at this locality would affect the flow at Warm Spring about 1,500 feet to the westward. Warm Spring, as indicated by both its temperature and location, is quite certainly not a water-table spring. Its deep-seated source is most likely the buried basin-range fault shown in Plate II by the north-south dashed line west of the spring. The presence of impervious Panaca clays above this fault might force these warm waters to find exit elsewhere in the Cambrian rocks or at the contact between the lake beds and limestones.

Since a simple water table well is expected at the proposed drilling site, withdrawal of water there should produce no appreciable effect upon the fissure spring (Warm Spring).

LAFE MATHEWS WELL

With the aid of a Water Facilities Loan, the Lafe Mathews well was drilled to a depth of 120 feet during May 1940 on the east margin of Meadow Valley in the SE¼NW¼ of Section 33, Township 1 S., Range 68 E. The water table was penetrated at a depth of 30 feet.

Following is the driller's log of the well:

0 feet to 30 feet—Clay and gravel; water table.
30 feet to 110 feet—Gravel and sand.
110 feet to 120 feet—Limestone.

The well was cased to a depth of 80 feet with perforations in the bottom 20 feet of casing.

The original test of the well is reported to have yielded 350 gallons per minute with a five-foot drawdown. The well has since caved below the bottom of the casing, and its yield is now reported to be only 100 gallons per minute with a 50-foot drawdown.

Examination of the cuttings from the bottom of the hole reveals both limestone and volcanic materials. The presence of both of these elements indicates that bedrock has not been reached, and that the hole bottoms in coarse gravel. This conclusion is supported by the high yield of the original test before caving.

As additional evidence that the well does not penetrate bedrock, its probable position may be stated as west of the Ely Range fault shown by the north-south dashed line on the map (Plate II).

The Ely Range block on the east side of this fault has been elevated at least a few thousand feet to throw the volcanics west of Condor Canyon in contact with the underlying Cambrian limestones and dolomites. Although the position of this fault can be determined within 500 feet at the mouth of Condor Canyon, its exact southerly trend is not known. Nevertheless, its position east of the Lafe Mathews well is expected. This would imply that when bedrock is penetrated at this well site, the rocks will be volcanic rather than limestone.

The conclusion is reached that the most porous and pervious zone of the Lafe Mathews well lies between 110 and 120 feet below the surface; and that if the hole had been cased throughout and perforated below 60 or 70 feet, its original yield (if properly tested) should be maintained.

RONNOW BROTHERS APPLICATION

The Ronnow Brothers are applicants for a water facilities loan to drill a well in the SE¼ of the SW¼, Section 28, Township 1 S., Range 68 E. This location is on the upper end of the Meadow Valley floodplain below the mouth of Condor Canyon.

Four rock units are involved in this area: Cambrian limestones and dolomites, Tertiary volcanics, Panaca lake beds, and Quaternary alluvium. In Pliocene time, after the Cambrian rocks of the Ely Range were elevated along the N.–S. Ely Range fault, the entire range in this vicinity, together with the low-relief surface of the downthrown Tertiary volcanics, was buried beneath the Panaca lake beds. After the basin was completely filled with the sediment, Meadow Valley Creek developed its present chance location as a consequent stream, but a thousand feet or so higher on the flat surface of the lake sediments. As a result of the downcutting of the lower portion of the stream course, through regional rejuvenation, the stream entrenched itself in the buried Ely Range, as a superimposed stream, to cut Condor Canyon. That the gorge was cut to a level appreciably below the present floor of the Canyon and the surface of the Meadow Valley floodplain is indicated by the thickness of Quaternary valley fill throughout this part of the drainage course. (See section B–B; Plate II).

Evidence to prove the existence of this filled channel are found both upstream and downstream from Condor Canyon.

The well on Harry Mathews' property in the SW¼ of the SW¼, Section 25, Township 2 S., Range 67 E., near the center of Meadow Valley between Panaca and Caliente, penetrates 150 feet of Quaternary alluvium before reaching the surface of the Panaca clays.

About one and one-half miles southwest of the Harry Mathews well at the Grant Lee well, in the NE¼ of NW¼ of Section 2, Township 3 S., Range 67 E., the Panaca clays are reached at a depth of 185 feet.

At the small water gap dam site at Delmue's Ranch, east of Condor Canyon, the reported depth through alluvium to bedrock is 78 feet.

There can be no doubt that the Quaternary fill occupies a deep channel through this region. Furthermore, in view of the Condor Canyon constriction immediately upstream, the nature of that fill at the proposed Ronnow Brothers drilling site should be mostly coarse in texture, and therefore both porous and pervious.

The development of a yield of one second-foot from this filled channel appears highly probable.

As indicated on Plate II, the suggested drilling site is located close to the present stream channel northwest of the railway grade crossing.

ARTESIAN WATER POSSIBILITIES

As stated earlier in this report, the nature of the pre-Panaca mantle deposits is unknown. In his reference to the pre-Panaca drainage of the upper Meadow Valley drainage area, Westgate (1932, p. 26) states that the "earlier stream circled the south end of the Ely Range." This would imply that there might well be fluvial deposits along the course of that stream.

Also, the steep slopes of the ranges as a result of the Basin-Range faulting would be dissected, and much of the debris would accumulate as piedmont fans.

Therefore, there is every reason to believe that the valleys and lower slopes of the ranges buried beneath the Panaca lake beds are covered with appreciable accumulations of stream gravels and fanglomerate deposits, the water-bearing qualities of both of which are well known.

Such detrital deposits, although generally overlain by the relatively impervious Panaca clays, should have some connection with the present surface by way of the coarser Panaca lake beds near the margin of the old lake basin. Further there should be free movement of water into them from the highly pervious Cambrian quartzites, limestones, and dolomites.

Since these coarsely detrital pre-Panaca rocks are nowhere exposed, and since they should have pervious connection with the more highly elevated zone of saturation on the margins of the basin, the water beneath the lake clays should be under appreciable hydrostatic head.

This does not mean that any hole to penetrate the Panaca beds will be a flowing well. In this regard, there are two matters of primary consideration: First, the local character of the pre-Panaca valley deposits; and, second, the frictional loss of head between the point of confinement and the point of aquifer penetration.

For example, in the center of the Meadow Valley Panaca Lake basin (not necessarily the center of the present Meadow Valley), the pre-Panaca alluvium may consist of playa deposits, and therefore be too fine for percolation. Also, how might the pressure gradient at the well site compare with the theoretical static level of artesian water at that point? These are matters that should be given serious consideration before a deep test hole is drilled through the Panaca clay in the search for artesian water in Meadow Valley.

The writer is of the opinion, nevertheless, that the principal pre-Panaca drainage, which in all probability entered Meadow Valley from around the southern extremity of the Ely Range, was influent between Panaca and a point no more than five miles south. If penetrated, these pre-Panaca river gravels should contain water under artesian pressure. Whether that head would be positive (would lift the water above the local water table level) or negative, the writer will not hazard an opinion without the possession of additional facts of a regional nature.

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CHAPTER XIII

Water Conservation and Development

(A statement covering some of the work done in this field by cooperating Federal agencies.*)

Briefly reviewed herein is the work done under the Water Facilities Program and the Soil Conservation District Program.

WATER FACILITIES

Under the Pope-Jones Act, commonly known as the Water Facilities Program, the Farm Security Administration and the Soil Conservation Service, working according to over-all plans drawn up by the Bureau of Agricultural Economics, have been forwarding the conservation and development of water for individual and group purposes in Nevada. This program offers financial and planning help to those who are not in a position to finance and carry through their projects by any other means. The activity has been in Clark, Lincoln, White Pine, and Lyon Counties.

To date the following areas in the State of Nevada have been approved for planning and/or operations by the Bureau of Agricultural Economics:

1. *Walker River Watershed*—In Mineral, Lyon, and Douglas Counties, Nevada, and Mono County, California.
2. *Virgin River Watershed*—Below the Virgin narrows including the Moapa River watershed, Pahranagat Valley and White River watershed in Clark, Lincoln, Nye, and White Pine Counties, Nevada; Beaver and Iron Counties, Utah; and Mohave County, Arizona.
3. *Steptoe-Spring Valleys Area*—In White Pine, Elko, and Lincoln Counties, Nevada.
4. *State of Nevada*—On November 10, 1941, the board authorized the entire State for operations limited to the development of farmstead water facilities and irrigation of not to exceed one acre of garden.

At present the Bureau of Agricultural Economics is planning an additional area known tentatively as the Snake Valley area, located primarily in White Pine County, Nevada, and Millard County, Utah. This area has not been authorized for operations to date.

The following brief outline reviews the completed and proposed projects and should be a basis of future work and planning for development along these lines, given in the order of:

1. Location.
2. County.
3. Development.
4. Purpose.
5. Remarks.

Moapa Valley "Lower" (Clark County)—Wells; domestic; wells were drilled near Overton, Logandale, and Glendale and equipped

*Acknowledgment is here given to the fine cooperative spirit shown by the Soil Conservation Service and the Farm Security Administration. The information herein was supplied by these agencies.

with pumps and pressure systems. The water was very poor in quality and tests were made, by use, to determine usability. After six months' trial the projects were abandoned. It was concluded that the shallow underground water in this valley is not satisfactory, and that it will be necessary to obtain other sources of water for the use of the residents of the valley.

Moapa Valley "Upper" (Clark County)—Pump and motor; irrigation; rehabilitation of an existing low efficiency unit.

Moapa Valley "Upper" (Clark County)—Concrete pipe; irrigation; saving of water due to seepage and evaporation losses in transportation.

Virgin River (Clark County)—Pumps and engines; irrigation; pumping from river to eliminate long ditches and to make more water available to farm land.

Virgin River (Clark County)—Design; irrigation; engineering plans for a diversion structure for Bunkerville and Mesquite to replace present dam. Information on file with Soil Conservation Service at Caliente, Nevada.

Meadow Valley Wash, Pahranagat Valley (Lincoln County)—Wells; irrigation, stockwatering and domestic; twenty-two wells were drilled in this area. Pumps, engines, and motors were installed on some of the properties. The report by Dr. Harry Wheeler covers a portion of this area. Developments show that underground water is available in this area in sufficient quantity for irrigation.

Town of Panaca (Lincoln County)—Water system; domestic; will supply acceptable culinary water for the town of Panaca and eliminate waste of irrigation water.

Spring Valley, Steptoe Valley (White Pine County)—Pipelines; irrigation; four pipelines have been installed to transport water across porous alluvial fans. Water savings show from 40% to 100%, as was the case of one installation where water was delivered to the farm for a period of four months longer than before.

White River (White Pine County)—Wells; irrigation; assistance given and the presence of underground water in sufficient quantity for irrigation was determined.

Fernley, Smith Valley (Lyon County)—Wells and/or pressure systems; domestic; sanitary, domestic, and farmstead water supply assured.

The Farm Security Administration has made available, to date, approximately $55,000 for financial assistance in the above projects.

SOIL CONSERVATION DISTRICTS

Meadow Valley District.	Mason Valley District.
Pahranagat Valley District.	Smith Valley District.
Virgin River District.	Carson Valley District.
Muddy River District.	White Pine District.

Accomplishments of soil conservation program in Nevada, including a partial list of construction, results of investigations, and results that may be anticipated:

An aerial survey has been made of the soil conservation districts in Nevada (excepting White Pine, just organized). On the area

within the districts (excepting White Pine), a physical survey has been completed by the Soil Conservation Service consisting of:

Soil—Slope, erosion, vegetative cover and culture.

Range—Vegetative cover, carrying capacity.

Forest—Vegetative type and class of timber.

A few of the installations, aside from concrete construction for grade rectification, consisting of drops, checks, and turnouts, are:

A 300-foot concrete-lined channel in Smith Valley with appurtenant structures of twelve cubic feet capacity carrying irrigation water down a steep grade.

An irrigation canal (Tunnel ditch) in Mason Valley five miles long, having a capacity of 75 cubic feet per second, was located and the construction done by the soil conservation district with equipment loaned to the district by the Soil Conservation Service. This canal serves 2,700 acres on six farms. An interesting feature of this canal is the attempt to divide the water proportionately without the use of gates or flashboards. The structures designed by the Soil Conservation Service seem to be performing satisfactorily.

On the Saroni Canal (Smith Valley) overpasses have been constructed for the purpose of protecting the canal and the town of Wellington from excessive runoff from the Wellington hills. Also, engineering assistance has been performed on grade revision and some realignment of this canal.

A design was made for the installation of a pipeline for a cooperator in Washoe County to convey irrigation water. This line was so designed that it could be used for fire protection of farmstead if occasion required.

A design was made for pipeline for a cooperator in Jack's Valley, Douglas County, to convey irrigation water and with possibilities of installation of overhead sprinkler system of irrigation.

Surveys were made and preliminary report and estimates were submitted for three possible dam sites on the East Walker River to form a regulating reservoir with a capacity of 1,000 acre-feet.

An investigation was made and feasibility established for the diversion of flood waters from the West to the East Walker River for conservation of water and benefits for farmers on the East Walker.

A report and estimate was made for a possible recreational park and game preserve in Smith Valley, to be constructed on Government or county-owned land, including approximately 300 acres, which area could be extended to 1,000 acres if desired. This project includes two small artificial lakes having a storage capacity of 275 acre-feet, with a surface water area of 70 acres. It is proposed to landscape the park, planting numerous trees, shrubs, and grasses of numerous varieties for demonstrational purposes and to provide a habitat for wild life. The lakes are to be stocked with fish and also used for recreational purposes. Surplus water from these lakes is to be spread to improve forage on adjacent land.

A report and preliminary estimates were made to construct a concrete log dam in the West Walker to serve as a diversion dam for the Colony and Plymouth Canal (Smith Valley).

IRRIGATION REVISIONS, SMITH AND MASON VALLEYS

Plans and estimates were made for the consolidation of six canals in Smith Valley into one system, thereby eliminating five dams in the West Walker River, reducing the length of irrigation laterals by 40%, making possible the reclaiming of some 250 acres of water-logged land, increasing duty of water, and reducing cost of operation and maintenance.

The investigation for ditch consolidation in the southeast portion of Mason Valley indicates that over 50% of the length of the present ditches can be eliminated, and that ditches in the revised system will be located on property lines and all present diversions, drops, checks, turnouts, etc., be constructed of concrete; and that with the elimination of the six present dams in the East Walker River the flow line of the river will be lowered from one to ten feet, thus reducing the amount of water-logged land and improving drainage.

In the main Walker River the consolidation to one point of diversion for the McLeod, Campbell, Nichols-Merritt, Joggles, Dairy, Spragg-Alcorn-Bewley, and the West Hyland systems would reduce the diversions from the river from seven to one, and provide a consolidated and efficient irrigation system for the lands affected.

A summary of results of studies in irrigation revision indicates not only the feasibility but the economy of such revisions, as the mileage of laterals would be reduced approximately 30%, and the number of diversions from the river would be reduced from nineteen to two.

IN THE CARSON VALLEY SOIL CONSERVATION DISTRICT

A report, estimates, and map have been furnished indicating present alignment of the East Carson River for a distance of ten miles, with profile and topography, also proposed realignment of river, and proposed grade rectification. The data submitted furnishes a basis for study of irrigation revision. Also a map similar in scope has been furnished including eight miles of West Carson River.

Therefore, data is available for a study of channel control and irrigation system revision for a large portion of the irrigated land in Carson Valley district.

MEADOW VALLEY DISTRICT SUMMARY

Investigations and surveys were made of Pine Canyon, Mathews, and Delmue dam sites for flood control and irrigation of territory within the Meadow Valley area. Construction of five reinforced concrete drop structures in the main Meadow Valley Wash to control erosion and raise the water table with the purpose of bringing back into production native meadows which have, to a large extent, been destroyed by the lowering water table. Numerous log, rock, and brush structures to serve the same purpose.

In the Meadow Valley Soil Conservation District, practices designed to prevent water losses and increase crop production included surveying and construction of 11,350 linear feet of irrigation canals.

North of Ursine three hundred and fifty-eight feet of post-rock wire revetment was constructed to protect the east fork of the irrigation ditch. This revetment stands five feet above ground. In addition

two thousand feet of the same ditch was realigned and repaired. The capacity of this ditch is six cubic feet per second.

The White Wash Reclamation Company Canal was excavated to carry 4.5 cubic feet per second from the Panaca Warm Springs to the White Wash Farm area, southeast of Panaca. The excavation began at the tunnel south of Panaca, where 160 feet of canal was concrete lined. Other construction work on the canal included the installation of five two-way headgates and sixty-one feet of semi-circular flume over the White Wash.

A sixteen-inch circular suspended flume, one hundred and fifteen feet in length, was built over Meadow Valley Wash at Caliente to carry five cubic feet per second from Meadow Valley Wash to the Duffin Ranch.

PAHRANAGAT VALLEY DISTRICT

Investigation, plans and cost estimates on a revision of the irrigation systems of the Pahranagat Valley taking into consideration all necessary drainage, was made. Construction of a drainage canal, irrigation canal and water spreading system in the lower valley by cooperative agreement and equipment loan was completed.

In Pahranagat Valley, thirteen hundred and fifty-seven feet of rectangular concrete ditch was enlarged by adding a trapezoidal section to carry six cubic feet per second. This is part of the East Alamo Canal and the portion immediately south of the Frehner home.

MUDDY RIVER DISTRICT

Complete plans for drainage and flood channel improvement have been made. Work has been done on both projects.

Field surveys have been under way in the Lower Moapa Valley, leading toward a complete revision of the irrigation system. The surveys were completed on the "West Side Irrigation Ditch" and work on the "East Side Irrigation Ditch" was in process at the end of the 1942 fiscal year.

Near Wells Siding the headworks for the Moapa Valley West Side Canal were constructed. These consist of one hundred and twenty feet of rubble masonry conduit with control gates to carry forty cubic feet per second, the conduit passing through the west end of the Wells Siding earth fill dam; seventy-eight feet of No. 84 Lennon flume with concrete headwall piers, two transitions, and thirteen hundred feet of canal. The flume carries the water over the emergency spillway. The canal below the flume at present is not lined, but it is proposed to line this conduit as soon as the labor supply permits, at which time the balance of fluming necessary will be installed.

VIRGIN RIVER DISTRICT

Work has been done on revision of existing facilities on individual farms. Considerable work has been completed on river bank protection.

WHITE PINE DISTRICT

Newly organized projects are being initiated and many problems studied.

PROJECTS APPROVED AND PARTIALLY CONSTRUCTED OR PENDING CONSTRUCTION—1940–1942

WATER FACILITIES

The following outline gives projects approved and partially constructed or pending construction for the period 1940–1942, in the order of:

1. Name of operator.
2. Location.
3. Type of project.
4. Estimated cash cost.
5. Planned use and benefits.

Bunker & Adams—Clark County, Virgin River six miles below Riverside, Nevada; stationary engine to replace tractor power on centrifugal pump. Also inlet, outlet, and desilting boxes; $900; will replace present tractor pumping power and result in much lower operating costs. Project will supply 4.5 c.f.s. from the Virgin River for the irrigation of approximately 80 acres of virgin land.

George H. Huntsman; Clark County, Virgin River three miles below Riverside, Nevada; centrifugal pump and engine to pump from Virgin River. Also realignment of irrigation system; $1,600; will replace some three miles of open ditch which is subject to severe floods and silting. Will provide water for irrigation of approximately 114 acres of land.

Ronnow Brothers; Lincoln County, Meadow Valley Wash, three miles north of Panaca; deep well, turbine pump and diesel engine; $2,500; will supplement waters of Condor Canyon with approximately 1 c.f.s. for irrigation of 66 acres.

Panaca Irrigation Company; Panaca, Nevada; deep well pump, motor and distribution lines for domestic water supply for town of Panaca; $27,340; will provide sanitary supply of domestic water under pressure for approximately 150 families in the town of Panaca and will release approximately 1 c.f.s. from Panaca Big Springs for irrigation purposes.

Frehner & Pace; Alamo, Nevada; well, pump, motor, and storage tank for domestic water supply for farmsteads of Albert Frehner & Sidney Pace; $900; will replace present unsatisfactory supplies with cooperatively owned system.

Teel & McKay; Clark County, upper Moapa Valley on Muddy River; rehabilitation of wornout pumping plant, new centrifugal pump and motor and concrete pipe distribution lines, $885; delivers and distributes approximately 1,000 g.p.m. for irrigation of approximately 70 acres land for diversified field crops.

Grant Lee; Lincoln County, Meadow Valley Wash, eight miles north from Caliente; deep well, turbine pump and electric motor and transmission line, $2,486; delivers approximately 500 g.p.m. for irrigation of approximately 60 acres virgin land; diversified field crops.

Lafe Mathews; Lincoln County, Meadow Valley Wash, one mile north of Panaca; deep well, turbine pump and engine, $1,476; supplements flood waters with approximately 300 g.p.m. for irrigation of approximately 65 acres of field crops.

Marion Yelland; White Pine County, North Spring Valley; approximately 6,000 feet of 10-inch concrete pipe transporting waters of Taft

Creek across alluvial fan, $4,847; will provide approximately 5 c.f.s. for irrigation of approximately 400 acres of land.

Will S. Heckethorn; White Pine County, North Spring Valley; approximately 6,200 feet of 12-inch metal pipeline transporting waters of McCoy Creek across alluvial fan, $7,900; supplies approximately 9 c.f.s. for irrigation of approximately 900 acres crop and hay land and 1,000 acres pasture.

Johansen & Heckethorn; White Pine County, North Spring Valley; 2,600 feet of 12-inch metal pipeline transporting waters of Bastion Creek across alluvial fan, $3,200; supplies approximately 6 c.f.s. for irrigation of approximately 450 acres of virgin land.

WELL DATA—MEADOW VALLEY, PAHRANAGAT VALLEY AND MOAPA VALLEY

No.	Property	Location	Casing Size, inches	Casing Length, feet	Depth Total feet	Depth Water feet	Depth Draw-down feet	Capacity g.p.m.
1.	Panaca*	B and 2d Sts.	.....	.....	60			
2.	Panaca	Between two hills	10	330				
			8	245				
			6	36	650			
3.	Mervil W. Hicks	White Wash	.....	.....	450			
4.	Allen Findlay	Panaca "Y"	.....	.....	150			
5.	H. V. Mathews	Highway No. 93	.....	.....	165	22		
6.	Lafe Mathews	2 mi. north of Panaca	12	121	125	33	6	168
			.....	.....	.....	.....	26	450
7.	Grant Lee	South Panaca	10	185	225	19	23	600
8.	Grant Lee	South Panaca	10	100	130	.....	48	162
9.	Delmue	Dry Valley	10¾	88	90	4	30	350
10.	John Devlin	Rose Valley	10¾	85	85	8	13	350
11.	Less Lytle	Rose Valley	10¾	54	76	.....	21–45	150
12.	Less Lytle	Rose Valley	.....	.....	88	16	8	350
13.	John Conway	Caliente	10¾	94	95	42	4	225
14.	John Conway	Caliente	10¾	.....	65	28	5	200
15.	John Conway	Caliente†	.....	.....	.....	.....	.....	.....
16.	Ryan	Caliente	10¾	54	55	21	5	125
17.	Karl Stewart	Hiko	10	80	93	60	.....	.....
18.	Karl Stewart	Hiko	10	67	87	41	5	302
19.	A. Frehner	Alamo	6⅝	.....	55	15	26	8
20.	E. Wadsworth	2 mi. north of Alamo	6⅝	80	80	15	6	19
21.	Alamo school	Alamo school	6⅝	60	70	70	.....	.....
22.	Crystal Springs	Demon. Area	3½	395	404	.....	.....	15
23.	C. A. Lewis‡	Overton	.....	.....	500	9½	27	24
24.	J. F. Lewis	Logandale	6	77½	120	23	12	35
25.	R. A. West	Glendale	7	257	325	.....	80	25

*Abandoned. †No record—well unsuccessful. ‡Poor quality water.

The logs of wells are as follows:

Well No. 5—

0 feet to 28 feet—Soil.
28 feet to 95 feet—Gravel.
95 feet to 110 feet—Coarse gravel.
110 feet to 130 feet—Quicksand.
130 feet to 150 feet—Slime and coarse gravel.
150 feet to 165 feet—Clay.

Well No. 7—

0 feet to 28 feet—Clay.
28 feet to 100 feet—Clay and some gravel.
100 feet to 185 feet—Gravel with clay and sand.
185 feet to 225 feet—Clay.

Well No. 22—

0 feet to 250 feet—Alluvial gravels.
250 feet to 382 feet—Porphyry.
382 feet to 390 feet—Porphyry and water.
390 feet to 404 feet—Porphyry.

Well No. 24—

0 feet to 25 feet—Fine sand.
25 feet to 45 feet—Sand.
45 feet to 50 feet—Hard shell.
50 feet to 55 feet—Water gravel.
55 feet to 90 feet—Hard sandy lime.
90 feet to 95 feet—Water gravel.
95 feet to 120 feet—Yellow clay.

The analyses of water are as follows:

Well No. 7—

Total solids 180°	654 p. p. m.
Silica (SiO_2)	74
Calcium (Ca)	55.7
Magnesium (Mg)	41.7
Sodium (Na) (Calc.)	104.4
Sulfate (SO_4)	132.5
Chloride (Cl)	69.1
Carbonate (CO_3)	Nil
Bicarbonate (HCO_3)	366.1

Alkali Coeff. K = 23.
Quality—good.

Well No. 6—

0 feet to 40 feet—Loose gravel with a brown filling.
40 feet to 65 feet—Loose gravel carrying some water.
65 feet to 88 feet—Gravel and clay.
88 feet to 95 feet—Loose gravel carrying water.
95 feet to 119 feet—Layer of clay and gravel.
119 feet to 125 feet—Conglomerate.

Well No. 21—

0 feet to 7 feet—Sandy loam.
7 feet to 10 feet—Rock.
10 feet to 15 feet—Sandy loam.
15 feet to 19 feet—Rock and gravel.
19 feet to 29 feet—Sand and clay.
29 feet to 33 feet—Gravel.
33 feet to 39 feet—Sand and clay.
39 feet to 60 feet—Sand.
60 feet to 70 feet—Clay.

Well No. 23—

0 feet to 50 feet—Sand with some clay, dry.
50 feet to 63 feet—Gravel, sand, clay, water bearing.
63 feet to 85 feet—Hardpan (cemented gravel), dry.
85 feet to 90 feet—Gravel, water bearing.
90 feet to 500 feet—Clay.

Well No. 25—

0 feet to 40 feet—Sand and clay.
40 feet to 45 feet—Water gravel.
45 feet to 300 feet—Alternate layers of sandstone and limestone.
300 feet to 325 feet—Limestone.

Well No. 23—

Total solids 180°	3106 p. p. m.
Silica (SiO_2)	19.0
Calcium (Ca)	186.6
Magnesium (Mg)	176.9
Sodium (Na) (Calc.)	502.8
Sulfide (SO_4)	1428.7
Chloride (Cl)	354.5
Bicarbonate (HCO_3)	366.1
Carbonate (CO_3)	Nil

Alkali Coeff. K = 4.6.
Quality—poor.

CHAPTER XIV

State Board of Registered Professional Engineers

The personnel of this board, the members of which are appointed by the Governor, but which elects its own officers, is as follows:

ALFRED MERRITT SMITH, State Engineer, Chairman.
STANLEY G. PALMER, Dean of the School of Engineering, University of Nevada, Secretary and Treasurer.
HUSTON D. MILLS, Assistant State Highway Engineer, Member.
WM. H. SETTLEMEYER, County Surveyor, Elko County, Member.
ARTHUR J. SHAVER, Manager Western States Utilities Company, Winnemucca, Nevada, Member.

ENGINEERS' REGISTRATION LAW

The Act providing for a State Board of Registered Professional Engineers was approved March 29, 1919, and was amended in 1935 and 1937. (Nev. Stats. 1935, 377, and Nev. Stats. 1937, 491–497.) The law provides for the licensing of professional engineers as defined by this statement:

> The practice of professional engineering within the meaning and intent of this Act includes any professional service such as consultation, investigation, evaluation, planning and design, or responsible supervision of construction or operation in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works or projects wherein the public welfare or the safeguarding of life, health or property is concerned or involved, when such professional services require the application of engineering principles and data; that the provisions of this Act shall not apply to nonresident mining engineers employed for the purpose of making mine examinations.

The provision regarding nonresident mining engineers was an amendment introduced in 1937. It has the effect of relieving the board from vouching for the qualifications of mining engineers who enter the State for the purpose of making specific or special examinations. Such engineers, however, are in no manner prohibited from registering, prior to which their credentials and engineering qualifications must become a matter of State record, and whereby their professional findings and reports on properties in this State would receive wider recognition in professional circles. The purpose of the law is to prevent the practice of engineering in any branch of the profession by unqualified persons, whereby unnecessary loss of money to investors or the public may be incurred, with possible loss of life, property, or both.

ACTIVITIES, JULY 1, 1940, TO JULY 1, 1942

On April 2, 1941, the board suffered the loss of its able and distinguished secretary, F. H. Sibley, Dean of the College of Engineering of the University of Nevada. Professor Stanley G. Palmer, appointed by Governor Carville in July 1941 was elected by the board to succeed Dean Sibley as Secretary and Treasurer.

During the past year, forty-seven new applications for registration have been approved. This is a larger number than in any previous year except at the time the board was first organized in 1935. The construction activities centering around the southern part of the State and around the Honey Lake and Lemmon Valley projects have doubtless been largely responsible for the increase. Many of the applications have come from prominent engineers registered in other States and now residing in or supervising work in Nevada.

FINANCIAL STATEMENT

Following is a statement of income and expenses of the board covering the period July 1, 1941, to July 1, 1942, as prepared by Secretary Palmer:

INCOME

From 47 new applications approved	$705.00
1 new application pending	15.00
126 renewal fees (on deposit)	315.00
45 renewal fees (cash and checks on hand	112.50
	$1,147.50

EXPENDITURES

Outstanding obligations in salary for former secretary and stenographer	$119.00
Salary of secretary, year 1941–1942	140.00
Stenographic help	50.00
Travel expense, members to attend board meetings	39.30
Postage, printing, telephone service, supplies	109.48
Expense of conducting examination	40.00
Membership in National Board, two years	50.00
Refunds on rejected applications	60.00
Collection charge on one check	.10
	$607.88
Funds withdrawn for purchase of two Series G war bonds, $500 each	1,000.00
	$1,607.88

Balance on deposit in bank July 1, 1941	$745.16
Total deposits for the year 1941–1942	1,035.00
	$1,780.16
Funds withdrawn during the year 1941–1942	$1,607.88
Funds remaining in bank July 1, 1942	$172.28

TOTAL ASSETS

On deposit in bank	$172.28
Two Series G war bonds	1,000.00
Cash and checks on hand July 1, 1942	112.50
	$1,284.78

CHAPTER XV

Colorado River Commission of Nevada

GOVERNOR E. P. CARVILLE, Chairman.
ALFRED MERRITT SMITH, Secretary.
A. J. CATON, Commissioner.
ED W. CLARK, Commissioner.
C. F. DEARMOND, Commissioner and Resident Engineer at Las Vegas.

The State Engineer has served, through successive reappointments, a period of six years as a member and the secretary of the Colorado River Commission. The service has been both State and National in scope, and is without special or additional compensation. Reports of former proceedings have been prepared by the Secretary and published in the Biennial Reports of the State Engineer, covering major transactions up to July 1, 1940. All important developments leading to the passage of the Boulder Canyon Project Adjustment Act, and the text of the Act itself will be found in the Biennial Report of the State Engineer for the period July 1, 1938, to June 30, 1940, pp. 102–122. Only the more important proceedings had since then are herein recorded. Many interesting details must of necessity be omitted in order to save space.

THOSE WHOM WE WOULD HONOR

Credit, so far as possible through complimentary mention, has been given to those who participated in these arduous tasks, in former reports by the Secretary, but the measure of their service to the State passes far beyond recognition by mere verbal praise. Beyond any question, this group of public-spirited men have rendered Nevada the most beneficial service in its history. Although the Boulder Canyon Project Act contained a provision for money to be paid to Nevada and Arizona from excess revenues, the amount was to have been determined on assumptions of unknown future power rates and production costs, placed on a competitive basis which could easily prevent accumulation of excess revenues.

Passage of the Adjustment Act provided and assured annual payments to Nevada of $300,000 per year, beginning June 1, 1938, and ending June 1, 1987, a total of $15,000,000.

During the period of most intensive work the commission has been under the leadership of Chairman E. P. Carville, Governor of Nevada, whose thorough legal training and wide judicial experience have been of the greatest value. His participation in the conferences held in Washington and western cities, his utterly fair and impartial dealing with controversial questions, and his ability to win the full trust and friendship of the many technicians, attorneys, and officials everywhere, have combined to make his contribution to the success of the program perhaps the greatest work ever performed by a Governor of Nevada.

I cannot refrain from again listing the men from Nevada who quietly and continuously worked on the plan which has so efficiently made possible a continuance of our slogan of "One Sound State." Among

these were Senator Pat McCarran, whose vigilance for the protection of labor as well as all other State interests was ceaseless; Senator Key Pittman, whose participation in all early Colorado River legislation made his help invaluable; Congressman James G. Scrugham, who likewise has a background beginning with his services as Nevada State Engineer in 1919–1922, and continuing as a member of the Colorado Interstate Commission with Herbert Hoover in 1922; Governor of Nevada in 1923–1927, up to his introduction of the Adjustment Act in Congress in 1940. These statesmen also had the major share of responsibility in getting the Act through Congress as well. The successful fight of Senators McCarran and Pittman to overcome the opposition of certain political interests to the Adjustment Act in the Senate will always be a memorable chapter of Nevada history. Jay Carpenter, Director of the Mackay School of Mines; Charles F. DeArmond, Resident Engineer and Commission member from Las Vegas; Commission members Ed W. Clark and A. J. Caton; Attorney-General Gray Mashburn, and Deputy Attorneys-General Howard Gray and Alan Bible, all gave unceasing help.

Agreement was had by the Colorado River Basin States on the terms of the proposed Adjustment Act in March 1939 at Denver. Subsequent further agreement on exact language was worked out in Washington by the States' "Committee of Three," with the Bureau of Reclamation, Bureau of the Budget, U. S. Treasury officials, and Senators and Congressmen from the Basin States. These agencies and the statesmen were very helpful and deserving of high praise. The Colorado River Commission of Arizona, and in particular members Alma M. Davis and Donald C. Scott, who were often present in Washington, performed outstanding service.

NEW POWER REGULATIONS AND CONTRACTS

The Boulder Canyon Project Adjustment Act was passed by Congress and approved by the President on July 19, 1940, and was the culmination of over six years of work to secure amendments to the original Act which would assure definite revenue to Nevada. Effectiveness of the Adjustment Act had been conditioned upon execution of new power contracts between the Government and the original power allottees, said contracts to be in conformity and based upon new regulations agreed to by allottees and the Secretary of the Interior. Section 9 of the Adjustment Act provided the secretary with authority to negotiate a termination of the existing lease upon the power plant held by the Los Angeles Department of Water and Power and Southern California Edison Company. The secretary proposed, in the new program, that the lessees continue operation as "agents" of the United States. New power contracts drawn to comply with the requirements of the Act had to be completed and entered into prior to June 1, 1941, or the Adjustment Act, upon which so much time and work had been expended, would become inoperative and void.

Although these conditions to make the Adjustment Act effective are simply stated, there were many complex problems to be worked out between the Government and power allottees, and between power allottees and their contractors, before such new contracts could be written. It was necessary to prepare and approve a completely new

set of complex regulations by which the Government would control and operate the reservoir and power plant, upon which to base the said new contracts.

On July 27, 1940, the Secretary of the Interior appointed Mr. R. V. L. Wright as his special representative to prepare findings of fact and assist in the preparation of new contracts and the governing regulations. On August 11, 1940, Mr. Wright called a conference on these matters in Los Angeles, California, which continued in session for about two weeks and was attended by all allottees and State officials in interest, accompanied by engineers and attorneys, sometimes forty in number. Meantime, negotiations were being carried on between the generating agents and the U. S. Bureau of Reclamation which culminated in a new draft of generating agency contract dated November 14, 1940. All points of difference had been agreed upon excepting three, which were:

1. Whether the power-plant building should be operated and maintained by the Bureau of Reclamation as formerly, or whether the proposed operating agents should take over the operation.
2. Controversy as to use of water for "spinning reserve" at generating efficiencies less than the efficiency contemplated in the studies upon which existing contracts were based.
3. Controversy as to the finality to be accorded findings of the Secretary of the Interior under the terms of a new agreement.

On February 19, 1941, Mr. Wright prepared a "Draft of Proposed Findings and Recommendations for the Effectuation of the Boulder Project Adjustment Act" and submitted it to the allottees. This draft was at variance with the opinions of the power allottees in many particulars. It was studied by the interested parties, and a subcommittee prepared a lengthy answering letter to Mr. Wright on issues deemed vital to them if new contracts were to be entered into.

Shortly after receipt of the allottees' letter in Washington, D. C., Secretary Ickes asked for a conference there, which lasted throughout April and May 1941.

In the preliminary meeting before the secretary it seemed that he was not willing to yield or compromise on any points of difference. However, he consented to full hearings on all matters, which were ably conducted by Messrs. Nathan Margold, J. Kennard Cheadle, Ivan Schwab and other lawyers for the department. Leland Olds, Harvey McPhail and other engineers also efficiently represented the Government. Governor Carville was able to be present at critical times and participate in the conferences. Each of the several power allottees was represented by special engineers and attorneys.

Space will not permit a summary of discussions that took place during the final six weeks of work on the contracts and the regulations. In the end, compromises were effected on all points of difference, although several times it seemed that agreement was impossible and that the Adjustment Act was doomed to extinction.

The greatest difficulty encountered was over a plan the Interior Department engineers had submitted to change the original basis of selling energy at high tension voltage to a program of selling energy as falling water only, leaving the risk of recovering that energy entirely on the allottees, and basing the efficiency of energy recovery

on a blanket figure of 83%. This stand by the bureau, for a time, seriously threatened to break up all negotiations. Operators having generating units allotted to them or hookups which for various reasons could not be operated at the maximum efficiency contended that they would be penalized, and produced convincing data. Some of the generators were definitely more efficient than others due to differences in their design and manufacture. Varying heads would also affect efficiencies of all generators. High efficiency for some allottees constituted an unfair bonus, and the reverse was true for low efficiencies. A necessity for "spinning reserve" would likewise lower generating efficiency. Finally the bureau receded from its position, the "83% plan" was abandoned and existing methods were changed but little. When this adjustment had been accomplished, it was felt with great relief by all members of the conference that all other differences would be resolved before June 1.

However, more problems and differences of opinion were encountered in working out the new contracts after the regulations upon which they were to be based had been approved. The work grew feverish as time elapsed and the "dead line" of June 1 approached, but finally all contracts had been prepared, and were reviewed and signed by the principals, but only on May 29, two days before the Adjustment Act would have been nullified.

LAS VEGAS MAGNESIUM PLANT

In late October 1941 the United States Government, acting through Defense Plant Corporation, decided upon the construction of a very large plant for the production of magnesium metal, to be erected at Las Vegas, Nevada. The estimated cost of the plant was to be approximately $60,000,000. Construction was to begin immediately on a very large scale. It was hoped that the plant would be able to go into production in the month of August 1942. Ore was to be supplied from a large deposit of magnesite located at Gabbs Valley about 30 miles north of the town of Luning in Nye County.

An enormous amount of electrical energy, estimated to be 1,500,000,000 kilowatt hours per year, will be required for the operation of the reduction plant at Las Vegas. At this date (July 1942) 10,000 men are employed on construction. A peak of 12,000 will be reached in September. When completed and in operation 4,000 will be employed in production.

The first negotiations with the commission regarding this colossal wartime industry were held in Washington on May 22, 1941, where Commissioners Smith and DeArmond were participating in the Boulder Canyon Project Adjustment Act new power contract hearings. Congressman James G. Scrugham advised the commissioners to confer with Attorney George B. Thatcher, representing Basic Magnesium, Incorporated, of Cleveland, Ohio. The commissioners assured Mr. Thatcher that Nevada would assist the industry in all ways possible, but could not alone, out of its allotment, supply sufficient power. They suggested immediate investigation of a probability of obtaining a large additional amount from Metropolitan Water District of Southern California which had contracted for a large block it had to pay for continuously, but would not be able to use for several years.

Negotiations were at once opened with Metropolitan and the Bureau of Reclamation which eventually led to a contract between Defense Plant Corporation and the U. S. Bureau of Reclamation for most of Metropolitan's unused power. A few days later another conference was held at which Senators McCarran and Bunker, Congressman Scrugham, engineers of Basic Ores Company, Major Ball of Magnesium Electron, Manchester, England, and Commissioners Smith and DeArmond were present, and discussed various phases of the program.

On December 8, 1941, representatives of the Colorado River Commission, consisting of Alfred Merritt Smith, C. F. DeArmond, and Deputy Attorney-General Alan Bible, conferred in Washington with John C. Page, Commissioner of Reclamation; J. Kennard Cheadle and Harvey McPhail, respectively Chief Counsel and Chief Engineer of the bureau. After some discussion the Nevada Commissioners agreed to supply by contract for a period of two years a quantity of 200,000,000 kilowatt-hours per year. It was also agreed that additional energy could be subsequently contracted for and withdrawn up to the limit of safety required by Nevada to meet other existing and immediately prospective contract demands within the State.

In round figures, it was estimated that Nevada's total allotment consisted of 750,000,000 kilowatt-hours. The present and prospective use for the year 1943 was taken at 333,000,000 kilowatt-hours, leaving a balance of 420,000,000 kilowatt-hours available, the contract to be entered into with the Government or its agent to be for 200,000,000 kilowatt-hours, which would leave a balance for Nevada for use in expanding industries and to meet the sure great demand which would be resultant upon increased population in Las Vegas and vicinity at 220,000,000 kilowatt-hours.

After a further conference at Los Angeles, Nevada eventually agreed to furnish Defense Plant Corporation 147,000,000 kilowatt-hours of energy during the period ending May 31, 1944, and 229,000,000 kilowatt-hours during the year ending May 31, 1945. The maximum demand in horsepower for this energy was fixed at 39,000.

The power was to be supplied to Defense Plant Corporation at cost. The State has a fixed charge of three-tenths mill per kilowatt-hour to cover administration and supervision through the Colorado River Commission. Purely from a patriotic viewpoint and because the large amount of power being contracted for by the Government would justify such reduction, this charge under the agreement was reduced to five-hundredths mill. Thereafter the commission returned to Nevada and the Government resumed negotiations for additional power with the other allottees. Progress in regard to the negotiations with these contractors was delayed in September due to complications arising regarding proposed use of Metropolitan Water District's unused Boulder power. This district had contracted for a large amount of Boulder energy which it will be unable to use for some years, but in the meantime it is obliged to pay for it at the falling water rate for firm power. Officials of the water district were considering the possibility of salvaging some of their expense for unused power by asking the Government to sell it for more than the fixed firm rate. The Government's desire to contract for all of Nevada's allotment of power at

the fixed rate was largely due to this position taken by Metropolitan Water District. The various officials of the Government with which the Nevada commission came in contact during the process of negotiation complimented the Nevada group for their cooperative and patriotic attitude.

The agreement which had been entered into by all power contractors from Boulder dam had been signed and executed as a basis for individual contracts. Some two weeks later the City of Los Angeles and its Department of Water and Power directed a letter to the Nevada commission giving a special interpretation of its own to certain clauses within the agreement, and asking that this interpretation be understood by all contractors and be made in effect a part of the agreement. Nevada took exception to this procedure. In this procedure, Southern California Edison and California Electric Power Company concurred by letters.

One point with which Nevada could not concur with the other allottees concerned certain restrictions they wished to place upon the Bureau of Reclamation's desire to salvage a part of the cost of the generator and transformer being installed by the bureau for use by Basic Magnesium Incorporated, designated Units G–7 and T–7. It was contemplated that not all of the capacity of the large generator would be immediately required by the magnesium plant, and also that for some time it would not be required by Metropolitan Water District, although Metropolitan would eventually become custodian of the generator and use all of its power. The Government wished authority to sell any of this surplus interim power to any purchaser qualified under the Boulder Canyon Project Act to purchase same. This contemplated procedure was objected to by the City, Edison Company, and The California Electric Power Company, who would require their consent before the disposal of surplus energy was made by the Government. They stated that such Government sale might react in some way to their financial disadvantage.

During the proceedings at Washington, D. C., in working out negotiations and contracts, Nevada had been compelled, in order to expedite the validation of the Adjustment Act, to agree with the City to use only up to 44,000 kilowatts of capacity from generators A–1 and A–2 allotted to the City, after which time Nevada would be required to secure power from other generators installed at the dam if possible to do so, or if unable to do so, to install a generator for her own use. Installation of a generator would cost $3,000,000 and require at least two years. At the time Nevada's agreement was made it could not be foreseen by anyone that war would come and a sudden enormous demand develop for all power available. During the year 1942 Nevada will have exceeded the capacity allotted to her from the City's generators, and must ask other generating capacity. It now seems possible to supply some of this growing demand from the new generator being installed by the Government, and we do not wish to be hampered in obtaining a part of such power, if it should become available, by objections on the part of California contractors. At present Nevada's contract with Defense Plant Corporation remains unexecuted pending the clarification of these two points. Nevada, however, will in the

meantime supply Defense Plant Corporation with all power possible or necessary without waiting for the execution of a contract.

Much water will be required for the operation of the magnesium plant, which must be obtained from the Colorado River via Lake Mead. For this purpose a contract was drawn up between Nevada and the Bureau of Reclamation for delivery of not to exceed 100,000 acre-feet per year to the State of stored waters from Lake Mead. Discussions as to this contract were carried on in Los Angeles at the same time that the energy contract was under consideration. A final meeting was held at Boulder City, Nevada, on June 1, 1942, where agreement was reached on all points excepting that of the cost to Nevada. The Nevada commissioners held that if any charge for storage was justifiable it should be for storage service only and not include a charge for power which might have been generated by the stored water if it had been passed through the turbines. Mr. Coffey agreed to refer this to the secretary. An excerpt from our letter of protest to an arbitrary charge of sixty cents per acre-foot follows:

> Under provisions of the Colorado River Compact and the Boulder Canyon Project Act, use of water for domestic purposes has first priority, irrigation second, and use for generation of power last. This diversion into Nevada is for domestic and metallurgical uses, and at this time entirely for the use of the United States Government. Any charge for the power this water might have generated should, if it is at all proper to render such a charge, be allocated to all users of the power and not to users of the water. In the contemplation of the Act, the generation of power at Boulder dam is a secondary consideration, for the dam was constructed primarily for flood control and irrigation; to save, conserve and reclaim lands, and for domestic use. The installation of hydroelectric power was to defray the costs of construction and operation during a period fixed at fifty years. Periodic adjustment of the rate was provided for and was necessary because of changing costs and fluctuating water supply, in order to amortize within a fifty-year period or a reasonable time thereafter. It would be as unfair to charge Nevada for the power that might be generated by this diversion as it would be to assess a similar charge against an upstream State for diversion of water within the 7,500,000 acre-feet limitation of the Colorado River Compact.
>
> A nominal charge for storage alone may perhaps be justified under the Boulder Canyon Project Act, but this is debatable. If the water to be diverted is considered as a part of the 300,000 acre-feet allotted to Nevada annually under the provisions of the proposed tri-State compact, there appears to be no fairness in a storage charge that does not treat all users of stored water alike. It is not equitable to charge Nevada for storage while not charging all other users a similar or equal rate. Among the various users of stored water Metropolitan Water District alone pays storage, other users being placed, by the terms of the Boulder Canyon Project Act, on

the basis that they had vested rights before the dam was constructed. Yet it will be admitted that the dam has made more water available than the quantity covered by their old rights, and this excess water is being or will be used, and the water so appropriated is not charged storage.

In conclusion, we state that Nevada's only interest in water is for use to develop its natural resources. This can be done only if the water is made available to people in Southern Nevada at the lowest possible price. Furthermore, water under this contract is for use of the Federal Government in national defense.

As yet no ruling has been made by the secretary regarding the price. The pipe line, 40 inches in diameter and 17 miles long, and a pumping plant, have been installed and are in operation, delivering water through a lift of about 450 feet into a reservoir located above the plant. Some of the water will be used by the Manganese Ore Company operating the "Three Kids" mine, eight miles east of the magnesium plant. Eventually some of the water may be used to augment the artesian supply for Las Vegas City.

REPORT OF LAS VEGAS OFFICE, JUNE 1, 1940–MAY 31, 1942

By C. F. DeArmond, *Las Vegas Resident Engineer*

Administration of the sale and delivery of power, division of costs between the State's contractors, billing and accounting and the collection and preparation of data for information of the commission are carried on through the Commission's office in Las Vegas under the supervision of C. F. DeArmond, Resident Engineer for the Commission. Because of accounting and engineering problems involved Mr. DeArmond has been called upon, along with other members of the commission, to be present at many hearings, investigations and negotiations both in and outside the State. These covered, in 1940–1941, Senate hearings in Washington on the Adjustment Act, Bureau of Reclamation in Denver re power facilities, Tri-State Compact negotiations at Grand Canyon, San Diego, and Los Angeles, 15 hearings in Los Angeles re adjustments and new contracts under the Adjustment Act, meetings of Committees of Fourteen and Sixteen at Boulder City, three meetings of the commission at Carson City, two meetings with Bureau of Power and Light at Los Angeles re generating facilities and costs, Department of the Interior at Washington for final negotiations of new power contracts under the Adjustment Act, and consultations in Washington and Las Vegas with regard to power and water for the magnesium plant.

In 1941–1942 consultations regarding power for the magnesium plant were continued in Washington in June and again in December of 1941, and six meetings with other power contractors were attended in Los Angeles during which agreements were reached for supplying power for this plant. A hearing by a senate sub-committee on strategic metals and minerals was attended in Los Angeles; a trip was made to the magnesium plant then being constructed near Palo Alto, California, with regard to power for a similar plant near Boulder dam; and other meetings as follows: National Reclamation Association at

Phoenix, Colorado River Drainage Basin section of the National Resources Planning Board at Los Angeles, Committee of Fourteen at Los Angeles, Sub-committee of Seven (engineers) of the Committee of Fourteen at El Paso, Texas, Sub-committee of Three (engineers) of the Sub-committee of Seven at El Paso, Texas. These two sub-committees were appointed by the Committee of Fourteen to study and report to the main committee on matters relating to present and prospective uses of water of the Colorado River both in the United States and in Mexico. Five meetings of the commission in Carson City were attended and one trip made to Washington with regard to water contract, power facilities and priorities, and one trip to Los Angeles on the same matters. The Resident Engineer, either alone or in company with other members of the commission and State officials, was obliged to participate in all of these important conferences.

The commission has also given freely of its services in the establishment of the magnesium and manganese industries.

A brief summary covering the obligations and the relationship of the various agencies using power from Boulder dam plant is given here for rapid reference.

The Boulder dam contracts and operations in connection therewith are based on operating years beginning June 1 and ending May 31 of the following year.

The United States, Department of the Interior. Guaranties of full repayment within a 50-year period of moneys advanced for construction of Boulder dam (except costs allocated to flood control), for installations of machinery and for costs of operation and maintenance of the project. The Act reduced the interest rate on such advances from 4% to 3% with the exception of the flood control item of $25,000,000 which is repayable after June 1, 1987, and is without interest up to that date. Ownership at all times remains with the United States.

The Seven States of the Colorado River Basin (Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming). The interests of all seven States were not identical and many preliminary meetings were necessary to compromise differences before effective work on passage of the Act could begin. All the States were interested in a "development fund" provided for in the Project Act, but of doubtful amount and almost certainly not available for expenditure during the lives of most of the negotiators. In order to expedite work between the States, two committees were set up. The Committee of Fourteen consists of two members from each State and deals with questions involving use of Colorado River water. The Committee of Sixteen consists of all members of the Committee of Fourteen with the addition of two members representing the California allottees of Boulder dam power, and deals with questions involving hydroelectric power on the Colorado River. Alfred Merritt Smith, Secretary, and Charles F. DeArmond, both members of the commission, represent the State of Nevada on these committees.

By agreement reached in the Committee of Sixteen a provision is incorporated in the Adjustment Act whereby $500,000 each year goes into a development fund, the amount being raised through an added charge to power users. The first $1,500,000 is for "studies and

investigations by the Bureau of Reclamation for formulation of a comprehensive plan for the utilization of the waters of the Colorado River system * * *." The next $7,500,000 "are authorized to be appropriated for the investigation and construction of such projects for such utilization in and equitably distributed among the four States of the upper division." After the year of operation ending in 1955 such receipts "are authorized to be appropriated for the investigation and construction of projects for such utilization in and equitably distributed among the States of the upper division and the States of the lower division."

The States of Arizona and Nevada. The interests of these two States in revenue to be derived from Boulder dam plant under the Adjustment Act are identical. The Project Act provided "If during the period of amortization the Secretary of the Interior shall receive revenues in excess of the amount necessary to meet the periodical payments to the United States as provided in the contract, or contracts, executed under this Act, then, immediately after the settlement of such periodical payments, he shall pay to the State of Arizona 18¾ per centum of such excess revenues and to the State of Nevada 18¾ per centum of such excess revenues." Studies of the contracts and of the Act indicated that innumerable computations could be made as to what these States would receive and all would be guesses based on assumptions of undeterminable future values. Had the contracts provided for a uniform rate for falling water of 1.63 mills per kilowatt-hour throughout the fifty-year period, determination of benefits to the two States could have been had within reasonable limits, but the contracts all provided for revision of rates in 1945 and every ten years thereafter; "it being understood that such readjusted rates shall under no circumstances exceed the value of said energy, based upon competitive conditions at distributing points or competitive centers." This is one of several factors which led to the conclusion by the commissions of both States to provide for definite annual payments. Such an agreement was reached with the other allottees and incorporated in the Adjustment Act as an added cost to all users of power. Nevada has received two payments of $300,000 each; $900,000 additional was due as of June 1, 1942, and it is indicated that this will be received before June 1, 1943. Thereafter, $300,000 is provided for the State for each of the operating years to and including 1987, making a total during the fifty-year period of $15,000,000.

Arizona and Nevada, equally with other allottees of Boulder Dam energy, were eager to secure and will be benefited by the lower power rates provided by the Adjustment Act.

The Southern California Edison Company and The City of Los Angeles. Both are allottees of power and were lessees of generating equipment. Under the Adjustment Act contracts they are designated as agents of the United States for the operation and maintenance, and the making of replacements of such portions of the Boulder power plant as may be necessary for generation of electrical energy.

The Edison Company generates for itself, California Electric Power Company, and the United States.

The Department of Water and Power of the City of Los Angeles

generates for itself, the States of Arizona and Nevada, the Metropolitan Water District of Southern California, the municipalities of Glendale, Burbank, and Pasadena, and the United States. As users of Metropolitan District power it also generates for Citizens Utilities Company of Kingman, Arizona, California-Pacific Utilities Company of Needles, California, and the Salt River Water Users Association of Phoenix, Arizona.

Allottees of Boulder Dam Power. All have been enumerated in the preceding paragraph, but the users of Metropolitan District unused energy are not allottees. All allottees were interested in a lower rate of interest, and the postponement of the burden of paying for flood control, an item of cost usually assumed by the Government. There were also questions as to allocations of machinery and costs, provisions for replacement annuities and operating problems which were adjusted during hearings following the passage of the Adjustment Act and during the negotiation of new contracts for all allottees under the Act.

Following the passage of the Adjustment Act and the conclusion of a new contract between the State of Nevada and the Department of the Interior for Nevada's allotment of Boulder dam energy, new contracts were drawn and signed between the State and its contractors. These contracts superseded those concluded under the provisions of the Project Act and extended to the State's contractors the benefits of the Project Adjustment Act. These contracts are all effective as of June 1, 1941.

Mining and Milling Operations. At the "Three Kids" mine, about eight miles east of the magnesium plant, Manganese Ore Company is constructing for Defense Plant Corporation a mill for the treatment of an estimated 6,000,000 tons of manganese ore from the Three Kids deposit. This plant will probably be in operation early in 1943. Estimated cost of plant and town is about $6,000,000. Power will be furnished from the State's allotment through the Southern Nevada Power Company. Estimated energy requirements for full operation are 30,000,000 kilowatt-hours per year. Estimated employment for operation 500.

The Blue Diamond Corporation has constructed a wallboard plant at its gypsum properties located about 20 miles southwest of Las Vegas. Employment is about 100.

On September 1, 1941, Combined Metals Reduction Company at Pioche placed in operation its newly constructed selective flotation plant for the treatment of 500 tons daily of its complex lead-zinc ores. This is a material contribution to the stability of the town of Pioche and may be directly attributable to the availability of energy from Boulder dam distributed by Lincoln County Power District No. 1.

As a result of the construction of the magnesium plant at Las Vegas an ore treatment plant has been constructed at the mines of Basic Ores Company at Gabbs in northwestern Nye County, at a cost of several million dollars.

USE OF BOULDER ENERGY UNDER STATE CONTRACTS

Southern Nevada Power Company

Use contract year ending May 31, 1941	22,143,384 KWH
Use contract year ending May 31, 1942	33,175,156 KWH

This increase of approximately 50% in the last year does not fully

indicate the expanding use of power in the Las Vegas area. During the last quarter of the operating year 1942 the increase over the corresponding quarter of 1941 was 98.3% and use in May 1942 was 118.5% over that of May 1941. Estimated use by this company for the year ending May 31, 1943, is 59,200,000 KWH.

Lincoln County Power District No. 1

Use contract year ending May 31, 1941.....18,335,963 KWH
Use contract year ending May 31, 1942.....24,233,989 KWH
Estimated use for contract year ending May 31, 1942..27,000,000 KWH

In four years of operation this district has not only met all bond and interest requirements but has built up a substantial cash reserve against future bond requirements, but has reduced its sale price of energy at its Pioche substation from 20 mills per kilowatt-hour in March 1938 to six mills per kilowatt-hour in May 1942.

Overton Power District No. 5

Use contract year ending May 31, 1941.....1,133,037 KWH
Use contract year ending May 31, 1942.....1,662,011 KWH
Estimated use for contract year ending May 31, 1943..1,800,000 KWH

This is an R.E.A. project which takes off from the Lincoln County Power District lines at 63 miles from the Boulder dam substation. It is beginning its fourth year of successful operation.

The total use of Boulder dam energy under State contracts in the year ending May 31, 1942, was 59,071,156 KWH, or 7.8% of the State's allotment.

Use for the year ending May 31, 1943, is estimated at 11.6%
Use for the year ending May 31, 1944, is estimated at 34 %
Use for the year ending May 31, 1945, is estimated at 45 %
These estimates are based on existing contracts.

The expansion in the Las Vegas area has brought upon the commission problems of securing transforming capacity to meet the increasing demands. Transformer capacity originally installed for Nevada's use was 15,000 KVA, and a portion of this was used by the Bureau of Reclamation to supply Kingman and Needles. Upon representations made through our Las Vegas office in 1938 and 1939 a new bank of transformers of 40,000 KVA capacity was installed and in use in November 1941. This bank will be fully loaded this winter, and negotiations are now proceeding for use of capacity allocated to other contractors in order to meet the rapidly growing demands. The magnesium plant is not involved since Defense Plant Corporation has secured its own transformers and transmission lines for this service.

The use of water from Lake Mead by Defense Plant Corporation made it necessary for the State to enter into a contract with the Bureau of Reclamation for the delivery of this water from storage in the lake. The negotiation of terms for this contract, begun early this year, are nearly complete. A contract for resale of water to Defense Plant Corporation has been prepared, but final draft awaits completion of our contract with the Bureau of Reclamation.

FINANCIAL REPORTS

Power is sold by the State at cost, plus a charge of three-tenths mill per kilowatt-hour to cover costs of administration and the obligations of the commission prescribed by law.

OPERATING YEAR ENDING MAY 31, 1941

Power Account—			
Cash as of June 1, 1940		$30,873.84	
1940–1941 receipts		95,577.99	
Total			$126,451.83
Less Payments—			
To U. S. for costs prior to June 1, 1940		$23,421.63	
To U. S. for 1940–1941 costs		94,595.79	
Total payments			118,017.42
Balance in power account as of June 1, 1941			$8,434.41
Commission Fund Account—			
Cash as of June 1, 1940		$6,790.07	
1940–1941 receipts		12,483.72	
Total			$19,273.79
Commission Expenses, Carson City Office—			
Commissioners' compensation	$80.00		
J. A. Carpenter	360.00		
Carl A. Heinze	250.00		
Travel	4,873.31		
Express and postage	29.90		
Telephone and telegraph	170.95		
Supplies and equipment	76.00		
Publications and printing	30.10		
Seven States' expense	267.50		
Miscellaneous	64.90		
Total Carson City Office		$6,202.66	
Commission Expenses, Las Vegas Office—			
Compensations	$5,400.00		
Travel	137.06		
Express and postage	31.99		
Telephone and telegraph	136.89		
Office supplies	43.78		
Rent	480.00		
Miscellaneous	5.00		
Total Las Vegas Office		6,234.72	
Total expenses			12,437.38
Balance as of June 1, 1941			$6,836.41

OPERATING YEAR ENDING MAY 31, 1942

Power Account—			
Cash as of June 1, 1941		$8,434.41	
1941–1942 receipts		106,709.03	
Total			$115,143.44
Less Payments—			
To U. S. for May 1941 costs		$959.85	
To U. S. for 1941–1942 costs		106,709.03	
Total payments			$107,668.88
Balance in power account as of June 1, 1942			$7,474.56

This balance is held in reserve pending final adjustment of costs for years prior to June 1, 1941.

Commission Fund Account—			
Cash as of June 1, 1941		$6,836.41	
1940–1941 receipts		17,836.75	
Total			$24,700.16
Commission Expenses, Carson City Office—			
Commissioners' compensation	$140.00		
Travel	3,032.34		
Express and postage	37.36		
Telephone and telegraph	87.22		
Supplies and equipment	18.26		
Printing	58.44		
Seven States' expenses	200.00		
Miscellaneous	130.21		
Total Carson City Office		$3,703.83	
Commission Expenses, Las Vegas Office—			
Compensations	$5,384.00		
Travel	252.83		
Express and postage	24.82		
Telephone and telegraph	184.64		
Office supplies	43.10		
Rent	480.00		
Equipment	394.00		
Miscellaneous	24.40		
Total Las Vegas Office		$5,787.79	
Total expenses			10,491.62
Balance as of June 1, 1942			$14,208.54

With the extraordinary expenses attendant upon passage and making effective the Adjustment Act a thing of the past, and with the expanding power sales, the commission will be able during the 1942–1943 operating year to refund to the State General Fund the $20,000 balance due it from the 1935 appropriation.

The commission holds bonds of contractors in the amount of $41,400 to secure fulfillment of contracts.

CHAPTER XVI

Irrigation Districts and Companies

IRRIGATION DISTRICTS

Walker River, Pershing County, Washoe County, Truckee-Carson, Muddy River, Newlands Project.

IRRIGATION COMPANIES

Preston Irrigation Company, Lund Irrigation Company, Bunkerville Irrigation Company, Mesquite Irrigation Company, Alamo Irrigation Company, Panaca Irrigation Company.

The following information was obtained through questionnaires and letters sent to the various organizations:

WALKER RIVER IRRIGATION DISTRICT

Officers—George Parker, President; John H. Wichman, Vice President; Fred W. Settelmeyer, Treasurer; C. O. Gelmstedt, Secretary; M. Dellamonica, V. S. Connell, Directors; W. M. Kearney, Attorney.

Office at Yerington, Nevada.

Organized April 14, 1919.

Walker River Irrigation District comprises all the irrigable lands of the east, west and main Walker Rivers in the State of Nevada, with the exception of the Walker River Indian Reservation. These rivers have their source in the eastern slopes of the Sierra Nevada Mountains, drawing from a watershed of some 3,000 square miles. The total area of the district is 260,000 acres, of which 160,000 acres are irrigable. At the present time, 119,236 acres are held under private ownership of which 79,686 acres have water rights. The irrigated area is approximately 53,000 acres.

During the past year, Senator McCarran, cooperating with the National Reclamation Association, the Nevada State Engineer, and the Walker River Irrigation District, has introduced U. S. Senate Bill S. 2416 which provides for the Bureau of Reclamation to take over the obligations of Irrigation Districts held by governmental agencies such as the Reconstruction Finance Corporation, and allow the districts to redeem the obligations without paying any further interest thereon. The enactment of this legislation would save the people of the Walker River Irrigation District $226,680 in interest between now and the year 1968, when the last of their bonds will be matured, and would place privately financed districts on a more equal basis with the many reclamation projects of the United States that have never had to pay interest on their obligations.

The outstanding bonded indebtedness of this district is now $380,000, a reduction of $90,500 since July 1, 1940. These bonds carry an interest rate of 4% per annum and are all held by the Reconstruction Finance Corporation. They are scheduled to be redeemed over the period between now and the year 1967.

A complete description of the operation and status of this district may be found in the 1934–1936 Biennial Report of the State Engineer.

LOCAL IMPROVEMENT DISTRICT NO. 4 OF THE WALKER IRRIGATION DISTRICT

SARONI CANAL

Officers—George Parker, President and Director; John H. Wichman, Vice President and Director; C. O. Gelmstedt, Secretary; Fred W. Settelmeyer, Treasurer and Director; M. Dellamonica and V. S. Connell, Directors.

Office at Yerington, Nevada.

Organized September 5, 1925.

The Saroni canal is operated under the improvement district and serves 24 farms having an acreage of 3,822 acres. The canal, having a capacity of 105 c.f.s., takes water from the West Walker River.

This improvement district now has an outstanding bonded indebtedness of $19,000, a reduction of $3,000 since July 1, 1940. These bonds carry an interest rate of 4% per annum, are all held by the Reconstruction Finance Corporation, and are scheduled to be redeemed over the period between now and the year 1966.

The enactment of U. S. Senate Bill S. 2416 referred to in the report on the Walker River Irrigation District would save this district $11,930 in interest between now and the year 1966 when the last of its bonds will be matured.

ALAMO IRRIGATION COMPANY

Officers—Karl Stewart, President; Harvey Frehner, Vice President; Dave Stewart, Secretary and Treasurer; Joseph Cox and Byron Ercanbrack, Directors.

Office at Alamo, Nevada.

Organized 1922.

The Alamo Irrigation Company was given decreed water rights for 501.1 acres of land from Ash Spring Creek by the decree of October 14, 1929. Of this amount of land, water rights were given for 435.1 acres of harvest crop land and the balance for diversified pasture land. It was also stipulated in the decree that when the pasture lands were drained and again cultivated that they should assume their rights as cultivated land. This land is now drained and cultivated and should be recognized as such.

The annual cost of the operation of the company is about $1,100 per year. The cost of maintenance of the system is approximately $640 per year. The company has no outstanding indebtedness.

The Soil Conservation Service has done considerable work on the ditch and drainage systems of the Alamo Irrigation Company. This work has been an outstanding success and the users are reaping, and will continue to reap, great benefits from this work.

The Alamo Irrigation Company stands 100% in favor of the Soil Conservation Service program for the improvement of the complete Ash Spring irrigation and drainage system. The company is ready and willing to defray their full share of this contemplated improvement.

PERSHING COUNTY WATER CONSERVATION DISTRICT

Officers—A. Jahn, President and Director; W. W. Carpenter, Vice President and Director; C. H. Jones, Treasurer and Director; C. C. Carpenter and C. Arobio, Directors; R. S. Leighton, Secretary; Roy

F. Meffley, Superintendent; R. S. Leighton, Engineer, and F. M. Preston, Caretaker at Rye Patch Dam.

The beginning of the fiscal year of 1941 marked the start of peaceful operation of the irrigation system in Lovelock Valley for the first time in many years. On June 13, 1941, a "Five Year Agreement" was negotiated and operated by all parties heretofore involved in lengthy and costly litigation.

During the irrigation season and winter months of 1940–1941 water supply was ample and agriculture made rapid progress.

On January 15, 1941, the operation and maintenance of the Humboldt project was officially placed with the Pershing County Water Conservation District by the Bureau of Reclamation. The Humboldt project works include Rye Patch dam and appurtenant works and property in Battle Mountain areas from which water rights were transferred.

The irrigation season of 1941 was successful, with an ample water supply being used efficiently through regulation at Rye Patch dam, and the year was ended with a holdover storage of 35,880 acre-feet.

The entire river flow was taken into Rye Patch reservoir in the spring of 1942 as the Humboldt Lovelock Irrigation Light and Power Company reservoirs were filled on December 15, 1941. The winter and spring flow of the Humboldt during 1942 was abnormally high, and on June 1, 1942, Rye Patch reservoir contained 160,000 acre-feet and was being held at that point to leave a capacity of 20,000 acre-feet to level the peak expected later.

The personnel of the district has been engaged primarily in operation and maintenance work. However, notable improvements have been made on the distribution and drainage system.

LUND IRRIGATION COMPANY

Officers—James Oxborrow, President; Harold Ivins, Vice President; Leland Hendrix, Secretary; Hugh A. Reid and Fernley Sinfield, Directors.

Office at Lund, Nevada.

Organized 1907.

This company delivers irrigation water to 1,500 acres of land in White Pine County through a gravity canal eight miles long. The source of the water is Preston Big Springs, Lund, Cold, Nicholas, and Horsley Springs.

The annual cost of operating averages $1,000, and the annual expenditures for repairs and replacements averages $200.

PRESTON IRRIGATION COMPANY

Officers—Andrew L. Petersen, President; H. A. Read, Vice President; Pharo Arnoldsen, Secretary and Treasurer; Lowell Petersen and Christian Hermansen, Directors.

Office at Preston, Nevada.

Organized March 24, 1911.

This company delivers irrigation water to 1,100 acres of land lying adjacent to Preston. The source of the water is Preston Big Spring and Arnoldsen Spring.

BUNKERVILLE IRRIGATION COMPANY

Officers—John Leavitt, President; Albert Leavitt, Secretary and Treasurer; John Leavitt, Hector Bunker, and Harley Adams, Directors.

Office at Bunkerville, Nevada.

Organized June 25, 1925.

In the decree entered in the Matter of the Determination of the Relative Rights of Claimants and Appropriators in and to the Waters of the Virgin River, in Clark County, State of Nevada, dated May 14, 1927, the Bunkerville Irrigation Company was decreed 12.37 c.f.s. continual flow of water from the Virgin River from March 1 to October 1, and a continuous flow of 8.66 c.f.s. from October 1 to March 1 of the following year, for the irrigation of 865.85 acres of land with a priority of prior to 1905.

Water is diverted from the Virgin River by means of a brush and rock dam and conveyed through a canal having an approximate capacity of 26 c.f.s. to the lands irrigated. At the present time 62 water users are being served on about 900 acres of land.

THE MESQUITE IRRIGATION COMPANY

Officers—James N. Pulsipher, President; Lemuel R. Abbott, Vice President; John A. Tobler, Secretary and Treasurer; Fenton Frelmer, Director.

Office at Mesquite, Nevada.

Organized June 8, 1925.

In the decree entered in the Matter of Determination of the Relative Rights of Claimants and Appropriators in and to the Waters of the Virgin River, in Clark County, State of Nevada, dated May 14, 1927, the Mesquite Irrigation Company was decreed 15.25 c.f.s. continuous flow of water from the Virgin River from March 1 to October 1, and a continuous flow of 10.67 c.f.s. from October 1 to March 1 of the following year for the irrigation of 1,067.37 acres with a priority of prior to 1905.

Water is diverted from the Virgin River by means of a brush and rock dam in Arizona, and located in the NE¼NE¼ of Section 3, Township 39 N., Range 16 W., S.L.&G.M., being about two and one-half miles easterly from the Nevada and Arizona State line, into a canal having a capacity of about 30 c.f.s. Some water is diverted from the canal to irrigate lands in Arizona.

The company also has a permitted right to appropriate 8 c.f.s for the irrigation of 800 acres of land in Nevada. The total acreage irrigated in Nevada approximates 1,747 acres.

CHAPTER XVII

The Quality of the Water of the Humboldt River

By M. R. Miller, *Chemist Agricultural Experiment Station Laboratory of Research.*

HUMBOLDT RIVER SALINITY CONDITIONS JULY 11–DECEMBER 31, 1941

The results of chemical analyses made on water samples taken from the Humboldt River from July 11 to December 31, 1941, were reported in January 1942.

The monthly discharge data, for each of the stations at which the samples were taken, have been obtained from the office of the State Engineer. This information now makes possible the present report in which is given the tonnages of dissolved salts passing each sampling station during each of those months in which samples were taken.

The locations of the gaging and sampling stations are as follows:

Palisade—In the SW¼ sec. 36, T. 32 N, R. 51 E. At this station 24 samples were taken at weekly intervals for the entire period.

Comus—29 miles above Winnemucca (approximately in the SW¼ sec. 13, T. 36 N., R. 41 E., and 1 mile east of Comus. Eighteen samples taken from July 3 to December 7, 1941.

Callahan Bridge—Approximately in the SW¼ sec. 25, T. 33 N., R. 33 E. Four miles NW of Imlay. Ten samples between July 16 and September 19.

Pitt Diversion Dam—Upper Lovelock Valley. Three samples between July 17 and August 13, 1941.

Last Diversion—No regular measurements. Five samples between July 18 and September 8, 1941.

After collection, the samples and flow data were sent to the laboratory at Reno.

On each sample the electrical conductance was determined and the results are given in Table I. The electrical conductance is given as the value of K x 10^5 at 25°C. This figure is a measure of the total amount of salts dissolved in the water.

For the more complete analysis, a monthly composite sample was prepared by mixing portions of the samples in proportion to the discharge in c.f.s. when the sample was taken for each individual station for the month. The monthly composite sample thus obtained was analyzed for its separate constituents by the methods which have been standardized for such samples in the laboratories of the Division of Western Irrigation. The results of these samples are given in Table II. The tabulated analyses include some or all of the following determinations:

1. Specific electrical conductance, expressed as K x 10^5 at 25°C.
2. Total dissolved solids, expressed as tons per acre-foot of water.
3. Hydrogen-ion concentration, expressed as p^H.
4. Calcium (Ca), expressed as equivalents per million (e.p.m.).
5. Magnesium (Mg), expressed as e.p.m.
6. Sodium (Na), expressed as e.p.m.

NOTE—In some of the analyses the values reported for sodium are the results of the direct determination of that constituent, in other analyses the values have been obtained by difference, *i.e.*, by subtracting the sum of the calcium and magnesium from the sum of the anions, bicarbonate, sulphate, chloride, and nitrate, all these constituents being expressed as e.p.m.

7. Potassium (K), expressed as e.p.m.
8. Carbonate (CO_3), expressed as e.p.m.
9. Bicarbonate (HCO_3), expressed as e.p.m.

NOTE—Because the normal carbonate (CO_3) occurs infrequently in irrigation water it is not reported by the analyst; the values are added to the values for the bicarbonate in the tables.

10. Sulphate (SO_4), expressed as e.p.m.
11. Chloride (Cl), expressed as e.p.m.
12. Nitrate (NO_3), expressed as e.p.m.
13. Silica (SiO_2), expressed as parts per million.
14. Boron (B), expressed as parts per million.

NOTE—The boron values reported in the tables were determined by the method of electrometric titration.

15. Fluoride (F), expressed as parts per million.
16. Silt (total suspended matter), expressed as tons per acre-foot of water.

NOTE—Since the chief objective of the investigations here reported has been to learn the conditions of salinity in the area, only incidental consideration has been given to the silt burden of the streams. In collecting the water samples no serious effort has been made to obtain samples that would adequately represent the silt conditions, and consequently the data on silt content here reported should not be taken as the best obtainable.

In Table III are given the results of the analyses in conjunction with the monthly discharge at the several points. The figures for monthly discharge were obtained from the State Engineer's office. Footnotes indicate the discharge in those cases in which complete weekly samples were not obtained; in those cases the discharge has been calculated from the flow at the time of sampling. This Table III indicates the salt burden, or amount of dissolved salts, being carried by the river at each point for the month indicated. The results are given in tons, both for the total quantity and for each salt constituent making up the total.

In Table IV the discharge and salt burden of the river at each station is given for the entire period, both the total tonnage and the tonnage of individual constituents. In the last column is given the average amount of dissolved salts per acre-foot of water at each station. The amount of dissolved salts per acre-foot of water increases as we proceed down stream. This increase in salinity is the result of several factors, namely, evaporation, leaching from deposits along the banks, contributions from tributaries, springs and seepages, and drainage and run-off water from irrigated areas.

The values given in Table V are derived from the preceding data.

The percent sodium is the percentage of the total cation constituents (Ca, Mg, Na) which is made up by sodium (Na). This figure may be taken as one of the indications of water quality in relation to maintenance of soil tilth. . The use of irrigation water containing high sodium percentages tends to impair the physical condition of the soil while the use of waters of low sodium percentages tends to maintain good physical condition or to improve poor physical conditions where that condition has been caused by the deflocculation of the clay fraction. No definite value can be given for this figure above or below which the water may be considered dangerous or valuable, since the character of the soil and other factors must be considered. However, sodium percentages much above 50% may be considered undesirable.

The percent chloride or percentage of chloride of the total anion (SO_4, HCO_3, Cl) constituents is chiefly valuable in that together with the percent sodium the general character of the water may be indicated. It is probably true that water having the higher percent chloride, with total dissolved solids about equal, would be the less desirable since the chloride is regarded as more toxic than the sulphate or bicarbonate.

The foregoing report has been prepared from data obtained up to December 31, 1941, and is the first general report on salinity conditions on the Humboldt River. The work is being continued and it is hoped that during the next few years a more complete picture of water quality of the river may be obtained. Such an understanding of the quality of the irrigation water used along the Humboldt River will make possible more efficient and intelligent use of the available water supply in the development and maintenance of a permanent agriculture.

The cooperation of the officials of Nevada State Engineer's office and officials of the Pershing County Water Conservation District in the collection of samples and in furnishing discharge data and other information is hereby gratefully acknowledged. Without such generous cooperation this Purnell Project No. 58 of the Nevada Agricultural Experiment Station could not well be carried out.

TABLE I

Humboldt River at Palisade and Comus, 1941

Concentration of dissolved solids as measured by specific electrical conductance ($K \times 10^5$ at 25°C)

1941	Palisade						1941	Comus					
Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Day	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	....	58	....	....	52	3	....	....	68			
2	....	....	....	....	51		4	....	....	....	....	73	
4	....	53					5	....	74				
6	....	....	....	60			7	....	....	....	....	....	63
8	....	....	57	....	....	54	11	....	....	70			
10	....	....	....	....	51		12	....	75				
11	....	45					15	58	....	....	....	59	
13	....	....	....	58			18	....	....	75			
15	....	....	58	....	....	55	19	....	60				
17	....	....	....	....	51		23	62	....	....	....	63	
18	....	54					25	....	....	....	68		
20	....	....	....	57			26	....	63				
21	47	....	55				29	65					
22	....	....	....	....	....	54	30	....	....	71	....	60	
24	....	....	....	....	53								
25	....	54											
27	....	....	....	56									
28	53												
29	....	....	56	....	....	56							

TABLE I-A

Humboldt River at Callahan, Pitt Diversion, Last Diversion

Concentration of dissolved solids as measured by specific electrical conductance ($K \times 10^5$ at 25°C)

Callahan				Pitt Diversion			Last Diversion			
1941 Day	July	Aug.	Sept.	1941 Day	July	Aug.	1941 Day	July	Aug.	Sept.
1	....	100		13	....	93	4	.....	.....	301
5	....	....	77	17	87		8	.....	.....	302
7	....	99		30	90		12	.....	238	
12	....	....	80				18	237		
14	....	79					30	244		
16	69									
19	....	....	79							
22	....	84								
24	76									
28	....	80								

TABLE II

Analyses of Humboldt River Water

SAMPLES TAKEN AT PALISADE, 1941

Month	Number of samples	T.D.S. p.p.m.	$K \times 10^5$	Boron p.p.m.	Equivalents per Million Ca	Mg	Na	HCO_3	SO_4	Cl
July	3	364.6	46.4	.....	2.37	0.84	1.65	4.18	0.49	0.28
Aug.	4	391.3	.....	0.15	2.38	0.89	1.62	4.23	0.65	0.60
Sept.	5	431.7	49.8	0.16	2.59	1.10	1.97	4.55	0.79	0.63
Oct.	4	450.4	55.6	0.23	2.64	1.17	2.30	4.61	0.85	0.66
Nov.	4	427.5	52.1	0.24	2.70	1.12	1.84	4.50	0.71	0.55
Dec.	4	430.0	53.3	0.14	2.66	1.11	2.03	4.50	0.93	0.53

SAMPLES TAKEN AT COMUS, 1941

Month	Number of samples	T.D.S. p.p.m.	$K \times 10^5$	Boron p.p.m.	Equivalents per Million Ca	Mg	Na	HCO_3	SO_4	Cl
July	3	463.4	60.6	.....	2.59	1.05	2.51	4.89	0.82	0.56
Aug.	4	515.7	58.3	0.25	2.52	1.05	2.88	5.12	1.10	1.23
Sept.	5	530.9	60.8	0.30	2.57	1.14	3.38	5.15	1.18	1.12
Oct.	1	514.4	68.2	0.26	2.01	1.23	3.84	4.75	1.21	1.24
Nov.	4	499.8	63.9	0.32	2.59	1.20	3.08	4.75	1.02	1.05
Dec.	1	407.9	63.0	0.18	1.79	1.16	2.79	3.89	0.76	0.97
To convert Equivalents per Million (e.p.m.) to Parts per Million (p.p.m.) multiply by the factor indicated					20.0	12.2	23.0	61.0	48.0	35.5

Explanation—T.D.S. = total dissolved solids.

$K \times 10^5$ = specific electrical conductance. This has an important relation to the dissolved matter.

Chemical Symbols—Ca (calcium); Mg (magnesium); Na (sodium); SO_4 (sulfate radical); HCO_3 (bicarbonate radical); Cl (chloride).

The above report is provisional, subject to revision.

TABLE II-A

Analyses of Humboldt River Water

SAMPLES TAKEN AT CALLAHAN BRIDGE, 1941

Month	Number of samples	T.D.S. p.p.m.	$K \times 10^5$	Boron p.p.m.	Equivalents per Million Ca	Mg	Na	HCO_3	SO_4	Cl
July	2	578.3	75.6	.....	2.87	1.31	3.47	5.55	1.19	1.30
Aug.	5	683.3	79.7	0.47	2.87	1.42	4.91	5.71	2.18	1.89
Sept.	3	574.7	72.4	0.32	2.62	1.28	3.83	5.17	1.46	1.52

SAMPLES TAKEN AT PITT DIVERSION DAM, 1941

Month	Number of samples	T.D.S. p.p.m.	$K \times 10^5$	Boron p.p.m.	Equivalents per Million Ca	Mg	Na	HCO_3	SO_4	Cl
July	2	663.9	90.4	.....	2.68	1.37	5.40	5.74	1.56	2.15
Aug.	1	662.9	93.1	0.39	2.73	1.31	4.36	4.80	1.59	2.47

SAMPLES TAKEN AT LAST DIVERSION LOWER LOVELOCK VALLEY, 1941

Month	Number of samples	T.D.S. p.p.m.	$K \times 10^5$	Boron p.p.m.	Equivalents per Million Ca	Mg	Na	HCO_3	SO_4	Cl
July	2	1333.8	228.0	1.65	1.76	2.00	17.22	4.87	3.93	12.84
Aug.	1	1414.9	238.0	4.30	1.89	2.12	17.87	4.80	3.47	14.30
Sept.	2	1783.2	291.0	2.64	1.73	2.22	24.19	5.40	4.32	18.42
To convert Equivalents per Million (e.p.m.) to Parts per Million (p.p.m.) multiply by the factor indicated					20.0	12.2	23.0	61.0	48.0	35.5

Explanation—T.D.S. = total dissolved solids.
K x 10^5 = specific electrical conductance. This has an important relation to the dissolved matter.
Chemical Symbols—Ca (calcium); Mg (magnesium); Na (sodium); SO_4 (sulfate radical); HCO_3 (bicarbonate radical); Cl (chloride).
The foregoing report is provisional, subject to revision.

TABLE III

Discharge and Salt Burden of the Humboldt River at Palisade Gaging Station from July 11 to December 31, 1941

1941	Discharge acre feet	Constituents in Tons							
		K x 10^5	Ca	Mg	Na	HCO_3	SO_4	Cl	Total
July[1]	11,020.0	46.4	710.4	153.6	568.7	3821.4	352.5	148.9	5,755.5
Aug.	7,737.8	.....	500.9	114.3	392.1	2715.4	328.3	224.1	4,275.1
Sept.	3,476.8	49.8	246.7	63.5	215.8	1312.4	179.3	105.8	2,123.5
Oct.	5,968.2	55.6	428.6	116.7	429.4	2282.5	333.6	190.2	3,781.0
Nov.	12,856.8	52.1	944.2	240.7	739.9	4799.7	595.9	341.4	7,661.8
Dec.	18,998.8	53.3	1374.7	349.9	1215.6	7092.6	1153.4	486.1	11,682.3
Total	60,058.4	.....	4215.5	1038.7	3561.5	22024.0	2943.0	1496.5	35,279.2

[1]Discharge for period July 11 to August 1, 1941, calculated from flow reported at time of sampling.

TABLE III

Discharge and Salt Burden of the Humboldt River at Comus Gaging Station from July 11 to December 7, 1941

1941	Discharge acre feet	Constituents in Tons							
		K x 10^5	Ca	Mg	Na	HCO_3	SO_4	Cl	Total
July[1]	15,074.0	60.6	1061.9	262.6	1183.5	6115.1	806.9	407.5	9,837.5
Aug.	7,339.2	58.3	503.1	127.9	661.2	3117.4	530.9	435.8	5,376.3
Sept.	2,864.8	60.8	200.3	54.2	302.9	1223.9	220.7	154.9	2,156.9
Oct.[2]	1,881.0	68.2	102.8	38.3	225.9	741.2	148.5	112.6	1,369.3
Nov.[3]	10,665.6	63.9	751.9	212.3	1027.5	4202.8	710.1	540.6	7,445.2
Dec.[4]	3,893.5	63.0	189.5	74.9	339.7	1256.4	193.1	182.3	2,235.9
Total	41,718.1	.....	2809.5	770.2	3740.7	16658.8	2610.2	1833.7	28,421.1

[1]Discharge for period July 12 to August 1, 1941, calculated from flow reported at time of sampling.
[2]Tonnages estimated for period October 22 to October 31, 1941, from one sample only, taken October 25, 1942. River flow was very low until the latter part of the month.
[3]Discharge for November calculated from flow reported at time of sampling.
[4]Discharge for period December 1 to December 10, 1941, calculated from flow reported at time of sampling.

TABLE III

Discharge and Salt Burden of the Humboldt River at Callahan Gaging Station from July 16 to September 25, 1941

1941	Discharge acre feet	Constituents in Tons							
		K x 10^5	Ca	Mg	Na	HCO_3	SO_4	Cl	Total
July[1]	19,352.2	75.6	1510.7	420.6	2100.5	8910.2	1503.3	1214.6	15,659.9
Aug.[2]	10,941.5	79.7	854.1	257.7	1680.4	5183.0	1557.0	998.4	10,530.6
Sept.[3]	3,465.0	72.4	246.9	73.5	415.1	1486.1	330.2	254.2	2,806.0
Total	33,758.7	.....	2611.7	751.8	4196.0	15579.3	3390.5	2467.2	28,996.5

[1]Discharge for period July 13 to August 1, 1941, calculated from flow reported at time of sampling. Includes flow in Feeder Canal to Reservoir.
[2]Calculated from flow reported at time of sampling. Includes flow in Feeder Canal to Reservoir.
[3]Calculated for period September 1 to September 25, 1941, from flow reported at time of sampling. Includes flow in Feeder Canal to Reservoir.

TABLE III

Discharge and Salt Burden of the Humboldt River at Main Diversion Gaging Station from July 15 to August 13, 1941

1941	Discharge acre feet	Constituents in Tons							
		K x 10^5	Ca	Mg	Na	HCO_3	SO_4	Cl	Total
July[1]	11,654.3	90.4	849.5	264.8	1968.5	5549.6	1186.8	1209.7	11,028.9
Aug.[2]	5,171.0	93.1	383.9	112.3	705.2	2052.4	536.7	616.6	4,407.1
Total	16,825.3	.....	1233.4	377.1	2673.7	7602.0	1723.5	1826.3	15,436.0

[1]Calculated for period July 15 to August 1, 1941, from flow reported at time of sampling.
[2]Calculated for period August 1 to August 14, 1941, from flow reported at time of sampling.

TABLE III

Discharge and Salt Burden of the Humboldt River at the Last Diversion, Lower Lovelock Valley, from July 17 to September 13, 1941

1941	Discharge acre feet	Constituents in Tons							
		K x 10^5	Ca	Mg	Na	HCO_3	SO_4	Cl	Total
July[1]	470.3	228.0	22.5	15.6	253.3	190.0	120.6	291.5	893.5
Aug.[2]	110.9	238.0	5.7	3.9	61.9	44.1	25.1	76.5	217.2
Sept.[3]	229.7	291.0	10.8	8.4	173.8	102.9	64.7	204.2	564.8
Total	810.9	757.0	39.0	27.9	489.0	337.0	210.4	572.2	1,675.5

[1]Discharge for period July 17 to August 1, 1941, calculated from flow reported at time of sampling.

[2]Discharge for period August 1 to August 13, 1941, calculated from flow reported at time of sampling.

[3]Discharge for period September 1 to September 13, 1941, calculated from flow reported at time of sampling.

TABLE IV

Summary of Discharge of Water and the Tonnage of Each of Six Salt Constituents Passing Five Stations on the Humboldt River Between July 11 and December 31, 1941

Station	Discharge acre feet	Constituents in Tons							Tons per acre foot
		Ca	Mg	Na	HCO_3	SO_4	Cl	Total	
Palisade	60,058.4	4,215.5	1038.7	3561.5	22,024.0	2943.0	1496.5	35,279.2	.58
Comus	41,718.1	2,809.5	770.2	3740.7	16,656.8	2610.2	1833.7	28,421.1	.68
Callahan[1]	33,758.7	2,611.7	751.8	4196.0	15,579.3	3390.5	2467.2	28,996.5	.85
Main Diver.[2]	16,825.3	1,233.4	377.1	2673.7	7,602.0	1723.5	1826.3	15,436.0	.91
Main Diver.[3]	810.9	39.0	27.9	489.0	337.0	210.4	572.2	1,675.5	2.06

[1]Data for July, August, and September. [2]Data for July and August. [3]Data for July, August, and September.

TABLE V

Percent Sodium and Chloride at Five Stations of the Humboldt River, July 11 to December 31, 1941

1941	Palisade		Comus		Callahan		Main Divers.		Last Divers.	
	Percent Na	Percent Cl	Percent Na	Percent Cl	Percent Na	Percent Cl	Percent Na	Percent Cl	Percent Na	Percent Cl
July	33.9	5.6	40.7	8.9	45.3	16.1	57.0	22.7	82.0	59.2
Aug.	33.1	10.9	44.6	16.5	53.3	19.3	51.9	27.9	81.7	63.3
Sept.	34.8	10.5	47.6	15.1	49.5	18.6	.....	.....	86.2	65.4
Oct.	37.6	10.8	54.2	17.3						
Nov.	32.3	9.5	44.8	15.3						
Dec.	35.1	8.8	48.6	17.2						

CHAPTER XVIII

Status of Applications Filed During the Period from July 1, 1940, to June 30, 1942

Following is a condensed statement giving the salient data in connection with applications filed during the period from July 1, 1940, to June 30, 1942, in the order of:

1. Application serial number.
2. Date of filing.
3. Name of applicant.
4. Source of water supply.
5. Purpose of appropriation.
6. Action on application.
7. Status of permits as of June 30, 1942.

10527.... 7– 6–40....Comstock Keystone Mining Company, a Nevada Corporation; Gold Creek; Mining, milling and domestic. Approved December 7, 1940.

10528.... 7– 6–40....Frank Dio Dato; Underground waters (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved March 28, 1941. G. S.

10529.... 7–10–40....C. R. Townsend; Monte Cristo Spring; Mining, milling and domestic. No action.

10530.... 7–11–40....Department of Highways, State of Nevada; Willow Springs; General domestic and use of traveling public. Approved December 11, 1940. G. S.

10531.... 7–12–40....John L. Harvey; A spring; Irrigation and domestic. No action.

10532.... 7–12–40....E. L. Cord; Robinson or Leidy Creek; Power and domestic. Approved March 19, 1941. G. S.

10533.... 7–15–40....Crater Range Mines, Inc.; An unnamed spring; Mining, milling and domestic. No action.

10534.... 7–15–40....Crater Range Mines, Inc.; Pine Creek, a tributary of Jarbidge River; Power and domestic. No action.

10535.... 7–15–40....Crater Range Mines, Inc.; Jarbidge River below Junction with Fox Creek; Power. No action.

10536.... 7–15–40....Crater Range Mines, Inc.; Unnamed Spring and the waters of Bonanza Creek; Mining, milling and domestic. No action.

10537.... 7–15–40....Mrs. E. N. Loftus; Underground water from Barton Wells Nos. 1 and 2; Irrigation and domestic. Approved June 10, 1941. G. S.

10538.... 7–17–40....United States of America, Department of Agriculture, Forest Service; Unnamed Spring, tributary to Pine Creek; Domestic and recreational purposes at the Pine Creek Campground. Approved March 25, 1941. G. S.

10539.... 7–17–40....United States of America, Department of Agriculture, Forest Service; Unnamed Spring, Meadow Creek Drainage; Domestic. Canceled October 8, 1940.

10540.... 7–19–40....Bruneau Gold, Inc.; An unnamed spring; Domestic. No action.

10541.... 7–22–40....P. M. Anderson; Cadle Spring; Mining and domestic. Canceled June 26, 1941.

10542.... 7–29–40....West Coast Mines, Inc.; Underground Source (West Coast Well); Mining, milling and domestic. Approved February 5, 1941. G. S.

10543.... 8– 1–40....Anna Savery; Underground waters; Domestic and commercial. Approved November 8, 1941.

10544.... 8– 2–40....Lemuel S. Leavitt; Virgin River; Irrigation and domestic. Approved March 28, 1941. G. S.

10545.... 8– 5–40....J. B. Omar and A. E. Evans; Underground Source through an artesian well; Mining and milling. Approved December 7, 1940. G. S.

10546.... 8– 6–40....Star Tungsten Mine, by George F. Ogilvie; Harrison Pass Creek; Mining, milling and domestic. No action.

10547.... 8– 9–40....Paul Irwin; Irwin Canyon Springs; Mining, milling and domestic. Canceled June 27, 1941.

10548.... 8–12–40....Mike O'Connor & Floyd Shaefer; Murray Spring; Stockwatering and domestic.* No action.

10549.... 8–15–40....Getchell Mine, Inc.; Unnamed Spring; Mining, milling and domestic.* No action.

10550.... 8–15–40....Getchell Mine, Inc.; Ward Spring; Mining and milling.* No action.

10551.... 8–21–40....John H. Conaway; Sevenokes Seep; Stockwatering. Approved March 12, 1941. G. S.

*Protested application. G. S. Good standing.

10552.... 8–23–40....Lois Kellogg II; Lee's Spring; Stockwatering and domestic. Canceled July 23, 1941.
10553.... 8–26–40....Thos. E. Hull; Underground waters (Las Vegas Valley Artesian Basin); Quasi-municipal. Approved April 1, 1941. G. S.
10554.... 8–31–40....Ella M. L. Dana and Sidney H. Vail; Dana-Vail Spring; Stockwatering and domestic.* Approved April 17, 1941. G. S.
10555.... 9– 5–40....George Hennen; Hennen Spring; Stockwatering and domestic. No action.
10556.... 9–10–40....G. M. Standifer; An underground source through a well; Mining and domestic. Denied November 14, 1941.
10557.... 9–14–40....H. A. Gilbert & J. M. Nelson; Gilbert Springs; Mining, milling and domestic. Withdrawn March 22, 1941.
10558.... 9–17–40....F. S. Talcott; Reed Canyon Creek; Irrigation. Approved December 20, 1941. G. S.
10559.... 9–20–40....John H. Bunch and Nellie Bunch, his wife: An underground source through a well (Las Vegas Artesian Basin or Subterranean Channel); Municipal, irrigation and domestic. Approved March 28, 1941. G. S.
10560.... 9–25–40....J. J. Klott; An underground source through an unnamed well; Mining, milling and domestic. Approved April 3, 1941. G. S.
10561.... 9–25–40....Petan Land & Cattle Company; On Bull Run Creek; Irrigation from storage. Approved April 3, 1941. G. S.
10562.... 9–25–40....N. E. Hanson; Underground waters through a well; Mining, milling and domestic. Approved March 6, 1941. G. S.
10563....10– 1–40....William Lahti; Crystal Springs; Domestic.* No action.
10564....10– 9–40....Green L. Storms and Lucy Storms; Spring Valley Creek; Mining and milling.* Approved June 19, 1941. G. S.
10565....10–10–40....C. A. Liddell; Indian Springs Nos. 4, 5, and 6; Mining, milling and domestic. Approved January 9, 1942. G. S.
10566....10–10–40....C. A. Liddell; Indian Springs Nos. 1, 2, and 3; Mining, milling and domestic. Approved January 9, 1942. G. S.
10567....10–14–40....Allie B. Adams; Eight Mile Spring; Stockwatering and domestic.* No action.
10568....10–21–40....Leon V. & Manley T. Garland; An unnamed wash; Mining, milling and domestic. Approved March 26, 1941. G. S.
10569....10–21–40....E. A. Sorensen, D. C. Blanchard & H. E. Hall; Brown Station Spring; Mining, milling and domestic. Canceled June 26, 1941.
10570....10–25–40....Red Cloud Mines, Inc.; Sheep Creek; Mining, milling and domestic. Withdrawn November 20, 1940.
10571....10–26–40....Harold D. Cornell; An underground source (Pahrump Artesian Basin) through an artesian well; Irrigation and domestic. Approved March 6, 1941. G. S.
10572....10–26–40....Harold D. Cornell; An underground source (Pahrump Artesian Basin) through an artesian well; Irrigation and domestic. No action.
10573....10–28–40....Helen Southerland Wengert; Underground artesian water through a well (Las Vegas Valley Artesian Basin or Subterranean Channel); Domestic. Approved April 1, 1941. G. S.
10574....10–30–40....Adrien Kuffer; Underground water (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. Approved April 7, 1941. G. S.
10575....10–30–40....E. L. Cord; Underground water through a well; Irrigation, stockwatering and domestic. Approved March 19, 1941. G. S.
10576....10–30–40....E. L. Cord; Underground source through a well; Irrigation, stockwatering and domestic. Approved March 19, 1941. G. S.
10577....10–30–40....E. L. Cord; Underground source through a well; Irrigation, stockwatering and domestic. Approved March 19, 1941. G. S.
10578....10–30–40....E. L. Cord; Underground source through a well; Irrigation, stockwatering and domestic. Approved March 19, 1941. G. S.
10579....11– 1–40....Harry F. & Grace I. Read; Underground source (Las Vegas Valley Underground Artesian Basin); Irrigation and domestic. Approved April 1, 1941.
10580....11– 4–40....G. C. Blaine and Clifford A. Jones; Underground source (Las Vegas Valley Underground Artesian Basin); Irrigation and domestic. Approved March 19, 1941. G. S.
10581....11– 6–40....Frederick Steigmeyer; Underground waters of Jefferson Creek Basin and/or surface flow of Jefferson Creek when and if, at point of diversion, there is a surface flow; Mining and domestic.* No action.
10582....11– 6–40....Theodore Michelas; Underground source (Las Vegas Valley Artesian Basin); Quasi-municipal. Approved March 28, 1941. G. S.
10583....11– 8–40....The Western Pacific Railroad Company; Cottonwood Springs; Locomotive and domestic. Approved March 21, 1941. G. S.
10584....11– 8–40....The Western Pacific Railroad Company; Little Cottonwood Springs; Locomotive and domestic. Approved March 21, 1941. G. S.
10585....11– 8–40....The Western Pacific Railroad Company; Cedar Spring; Locomotive and domestic. Approved March 21, 1941. G. S.
10586....11– 8–40....The Western Pacific Railroad Company; Little Cedar Spring; Locomotive and domestic. Approved March 21, 1941. G. S.
10587....11– 8–40....J. N. Bryan; Long Canyon Creek and Well in same; Stockwatering.* No action.
10588....11– 8–40....J. N. Bryan; Tank Canyon Springs; Stockwatering.* No action.

*Protested application. G. S. Good standing.

10589....11–14–40....Eldorado-Rover Mining Company, Inc.; Colorado River near mouth of Eldorado Canyon; Mining and milling ores and domestic. Approved March 3, 1941. G. S.

10590....11–14–40....J. A. Hail; Naquinta Valley; Underground source through a well; Stockwatering and domestic.* No action.

10591....11–16–40....The Whitehall Lodge Corporation; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel) through an artesian well; Quasi-municipal. Approved October 10, 1941.

10592....11–18–40....City of Yerington, a municipal corporation; an underground source through a well; Quasi-municipal and domestic. Approved October 27, 1941.

10593....11–20–40....Harold D. Cornell; Pahrump Valley Artesian Basin (artesian well); Irrigation and domestic. Approved August 9, 1941. G. S.

10594....11–22–40....W. T. Stewart; Naquinta Valley Dry Channel—Reservoir No. 1; Stockwatering and domestic. Approved June 24, 1942. G. S.

10595—11–22–40....W. T. Stewart; Belted Range Channel and Tributaries—Reservoir No. 2; Stockwatering and domestic. Approved June 24, 1942. G. S.

10596....11–22–40....W. T. Stewart; Papoose Channel and Tributaries—Reservoir No. 3; Stockwatering and domestic. Approved June 24, 1942. G. S.

10597....11–22–40....W. T. Stewart; Papoose Dry Lake Channel from Papoose Dry Lake Reservoir No. 4; Stockwatering and domestic. Approved June 24, 1942. G. S.

10598....11–26–40....Lois Kellogg II; Underground source (Pahrump Artesian Basin); Irrigation and domestic. No action.

10599....11–26–40....Lois Kellogg II; Underground source (Pahrump Artesian Basin); Irrigation and domestic. No action.

10600....11–26–40....Lois Kellogg II; Underground source (Pahrump Artesian Basin); Irrigation and domestic. No action.

10601....11–29–40....Old English Gold Corporation; Troy Creek; Mining, milling and domestic. Approved November 8, 1941.

10602....12– 2–40....Carl A. Foster; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel) through an artesian well; Domestic. Approved March 19, 1941. G. S.

10603....12– 6–40....G. M. Standifer; Well No. 1 and connecting sumps, approximately 150 feet by 150 feet; Mining and domestic. Approved April 10, 1941. G. S.

10604....12–11–40....R. M. Miller; Cool Spring; Stockwatering. Approved July 2, 1941. G. S.

10605....12–26–40....United States of America, Department of Agriculture, Forest Service; Boy Scout Spring (Success Summit) Duck Creek Drainage; Domestic and recreational. Approved July 15, 1941. G. S.

10606....12–26–40....United States of America, Department of Agriculture, Forest Service; Unnamed Spring, Meadow Creek Drainage; Domestic. Approved March 25, 1941. G. S.

10607.... 1– 2–41....Fred S. Talcott; Flood waters from Buena Vista Valley; Irrigation and domestic.* Approved December 20, 1941. G. S.

10608.... 1–10–41....Murray Wollman; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved May 5, 1941. G. S.

10609.... 1–11–41....Charles L. Sherwood; North Fork of Owyhee River; Milling and domestic. Approved December 29, 1941. G. S.

10610.... 1–13–41....Anna Savery; Unnamed Creek and Springs; Irrigation and domestic. Approved November 8, 1941. G. S.

10611.... 1–16–41....Marion E. Yelland; Taft Creek; Irrigation. Approved July 14, 1941. G. S.

10612.... 1–21–41....United States Indian Service; Underground water in the Las Vegas Artesian Basin; Quasi-municipal. Approved July 11, 1941. G. S.

10613.... 1–27–41....John H. Conaway; Underground waters from Meadow Valley Wash through "Well No. 1"; Irrigation. Approved July 3, 1941. G. S.

10614.... 1–27–41....John H. Conaway; Underground waters from Meadow Valley Wash through "Well No. 2"; Irrigation and domestic. Approved July 3, 1941. G. S.

10615.... 1–28–41....J. W. Lambert, George F. Bauerdorf and Joe Feldman; Underground source through a well; Mining, milling and domestic. Approved June 9, 1941. G. S.

10616.... 1–29–41....Jack Ferguson and W. L. Fisk; Jack O'Conner Spring; Stockwatering and domestic. Approved October 27, 1941. G. S.

10617.... 2– 5–41....Department of Highways; Chiatovitch Creek; Domestic, irrigation of trees at Maintenance Station and use of traveling public.* No action.

10618.... 2– 7–41....Carter Bros., individually known as A. N. and Lafayette Carter; Underground source through a well; Irrigation. Approved December 20, 1941. G. S.

10619.... 2–13–41....Wilson M. Tennant; South American Canyon; Mining and domestic. Canceled October 23, 1941.

10620.... 2–14–41....Press Duffin, Jr.; Underground source through a well; Irrigation and domestic. Approved October 27, 1941. G. S.

10621.... 2–18–41....A. C. Ronald; Underground source through an artesian well; Irrigation and domestic. Approved June 10, 1941. G. S.

*Protested application. G. S. Good standing.

10622.... 2-18-41....Howard N. Sharp; Desert Reservoir; Stockwatering. Withdrawn April 15, 1941.
10623.... 2-18-41....H. J. Scott, Trustee; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. Approved July 22, 1941. G. S.
10624.... 2-19-41....Estelle Cox Wilbourn; Underground Source (Las Vegas Valley Underground Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved September 23, 1941. G. S.
10625.... 2-19-41....Charles Culverwell; Old Culverwell Spring; Irrigation and domestic. Approved July 23, 1941. G. S.
10626.... 2-19-41....Perry White; Upper and Lower Coyotte Springs; Mining and milling. Canceled October 1, 1941.
10627.... 2-21-41....John H. Conaway & D. L. Stewart; Pony Spring Dry Channel No. 3 Catch Basin Reservoir; Stockwatering and domestic. Approved July 16, 1941. G. S.
10628.... 2-21-41....Roland Wiley; Underground source through a well; Irrigation and domestic. Canceled October 1, 1941.
10629.... 2-24-41....John H. Conaway; Mona Spring; Stockwatering. Approved July 2, 1941. G. S.
10630.... 2-24-41....Ezra B. Coram; Underground source through an artesian well (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. Approved July 11, 1941. G. S.
10631.... 2-25-41....N. E. Hanson; An underground source through a well; Mining, milling and domestic. Approved October 10, 1941. G. S.
10632.... 2-25-41....N. E. Hanson; An underground source through a well; Mining, milling and domestic. Approved October 10, 1941. G. S.
10633.... 2-27-41....Copper Canyon Mining Company; Copper Canyon Springs; Domestic. Approved July 2, 1941. G. S.
10634.... 3-11-41....Martin E. Lugea; Gold Ace Spring; Mining and domestic. Approved January 23, 1942. G. S.
10635.... 3-11-41....Mr. and Mrs. Carl Baker; An underground source (Las Vegas Valley Artesian Basin or Subterranean Channel) through a well; Quasi-municipal. Approved July 11, 1941. G. S.
10636.... 3-12-41....Arthur S. Nichols; Woodman Springs; Mining, milling and domestic.* No action.
10637.... 3-24-41....W. B. Adams; Flood waters from Delamar Flat Dry Lake, in Adams Reservoir; Stockwatering.* Denied June 8, 1942.
10638.... 3-24-41....W. B. Adams; Flood waters from Delamar Flat Dry Lake, in Stewart Reservoir; Stockwatering.* Denied June 8, 1942.
10639.... 3-24-41....Grant Lee; Lee Well; Irrigation. Approved November 8, 1941. G. S.
10640.... 3-29-41....Walter W. Hartman; Underground source; Mining, milling and domestic. Approved June 12, 1942. G. S.
10641.... 4- 3-41....Consolidated Goldacres Company, a Corporation; Underground source through a well; Mining and domestic. Canceled October 1, 1941.
10642.... 4- 4-41....Lee E. Pitts; Underground flow on Dry Creek; Mining and milling. Canceled October 24, 1941.
10643.... 4- 5-41....Morris Rose; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel) through an artesian well; Irrigation and domestic. Approved October 15, 1941. G. S.
10644.... 4- 9-41....Theodore R. Tamney; Underground source through a well; Mining and domestic. Approved October 27, 1941. G. S.
10645.... 4-10-41....C. L. Averett; Underground source through a well; Stockwatering and domestic.* Approved November 8, 1941. G. S.
10646.... 4-11-41....Herbert Allred; Underground source through a well (Allred Well); Irrigation. Approved December 29, 1941. G. S.
10647.... 4-18-41....Earl W. Felker; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel) through an artesian well; Irrigation and domestic. No action.
10648.... 4-19-41....Ed. Filippini; Addington Springs; Irrigation and domestic. Approved October 10, 1941.
10649.... 4-19-41....Homer W. Bell and Charles Kialhofer; Unnamed Hot Springs; Bathing and medical. Approved May 5, 1942. G. S.
10650.... 4-19-41....James and Emily Griel; Griel Springs Nos. 1 and 2; Irrigation and domestic. Approved January 10, 1942. G. S.
10651.... 4-21-41....Gus Williams, Wilbur and F. J. Seyden; Perazzi Slough; Irrigation and domestic.* No action.
10652.... 4-24-41....C. L. Averett; Averett Spring; Stockwatering and domestic.* Approved November 8, 1941. G. S.
10653.... 4-24-41....C. L. Averett; Hidden Springs; Stockwatering and domestic.* Approved November 8, 1941. G. S.
10654.... 4-28-41....John H. Conaway; Delamar Valley Drainage; Stockwatering. Approved January 7, 1942. G. S.
10655.... 4-30-41....John H. Conaway; Buckboard Spring; Stockwatering. Approved October 10, 1941. G. S.
10656.... 4-30-41....John H. Conaway; Willow Spring; Stockwatering. Approved October 10, 1941. G. S.
10657.... 5- 3-41....J. O. Greenan; Willow Creek; Placer mining. Approved October 27, 1941. G. S.
10658.... 5- 5-41....Star Tungsten Mine, by George F. Ogilvie; Lime Kiln Canyon; Mining.* No action.
10659.... 5-10-41....James Ryan and John H. Conaway; Flood waters of Delamar Flat Hardpan "Black Point Reservoir"; Stockwatering. Approved March 6, 1942. G. S.

*Protested application. G. S. Good standing.

10660.... 5–10–41....J. W. Wilson and Elmer Mikkelsen, a Copartnership, doing business under the name and style of Wilson & Mikkelsen; Underground waters (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation, domestic and general service station use. Approved December 29, 1941. G. S.

10661.... 5–12–41....G. M. Standifer; Well No. 3 and connecting sumps, approximately 150 feet by 150 feet; Mining and domestic. Approved October 30, 1941.

10662.... 5–14–41....Caliente Public Utilities; Underground source through a well (Well No. 3); Municipal. Approved October 17, 1941. G. S.

10663.... 5–14–41....Caliente Public Utilities; Underground source through a well (Well No. 2); Municipal.* No action.

10664.... 5–19–41....V. E. Greenwald; Bryan Spring; Stockwatering.* No action.

10665.... 5–21–41....Jim Wilker; Springs in and near the head of Anderson Gulch; Mining, milling and domestic. Withdrawn October 7, 1941.

10666.... 5–22–41....Thomas W. Allan; Underground water; Irrigation and domestic. Canceled January 30, 1942.

10667.... 5–24–41....Roy E. Smith; East Fork of Jarbidge River; Irrigation. No action.

10668.... 5–24–41....V. E. Greenwald; Seep Spring; Stockwatering.* No action.

10669.... 5–24–41....Louis Perozzi; Underground source through an artesian well (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. Approved April 28, 1942. G. S.

10670.... 5–26–41....Arthur Leon Arnold; Underground artesian water (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. Approved October 27, 1941.

10671.... 5–26–41....Harvey S. Hale; Cedar Creek; Irrigation. Canceled January 30, 1942.

10672.... 5–26–41....Fort Pierce, Incorporated; San Jose Tunnel, Main Drainage Tunnel, Egan Mine (underground waters); Mining, milling and domestic. No action.

10673.... 6– 2–41....Edith B. Ferraro; Cottonwood Creek; Irrigation. Approved February 21, 1942. G. S.

10674.... 6– 4–41....Timothy Harnedy; Underground source; Irrigation and domestic. Withdrawn June 17, 1942.

10675.... 6– 4–41....Eloise Bunker and John M. Bunker, husband and wife; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. Approved October 27, 1941. G. S.

10676.... 6– 9–41....Basic Ores, Inc.; Underground source through a well; Mining, milling and domestic. Approved December 23 1941. G. S.

10677.... 6– 9–41....Lois Kellogg II; Underground source (Pahrump Artesian Basin); Irrigation. No action.

10678.... 6–10–41—Barium Products Ltd.; Underground source through a well; Mining and domestic. No action.

10679.... 6–19–41....Eloese Bunker; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation, domestic, and quasi-municipal. Approved April 23, 1942. G. S.

10680.... 6–21–41....J. R. and Arline Edmonds; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved January 9, 1942. G. S.

10681.... 6–23–41....Frank Cornero; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Domestic. Withdrawn September 30, 1941.

10682.... 6–26–41....Fred Bartine; Eureka Creek; Irrigation.* Approved April 10, 1942. G. S.

10683.... 6–26–41....Earl B. Crouch; Victorine Creek; Mining and milling.* No action.

10684.... 6–26–41....Earl B. Crouch; Victorine Creek; Power and domestic.* No action.

10685.... 6–26–41....Earl B. Crouch; Big Smoky Creek; Power.* No action.

10686.... 6–30–41....J. J. Thrasher; Waters of Jennie Creek (which have their source in an unnamed spring); Mining, milling, and domestic. No action.

10687.... 7– 3–41....P. M. Anderson; Codle Springs; Mining and domestic. No action.

10688.... 7– 3–41....United States of America, Forest Service; Unnamed Spring; Irrigation. Approved June 22, 1942. G. S.

10689.... 7– 3–41....United States of America, Forest Service; Unnamed Spring tributary to Pine Creek; Domestic and recreational purposes at the Pine Creek Campground. Approved December 26, 1941. G. S.

10690.... 7– 3–41....United States of America, Forest Service; Unnamed Spring; Domestic. Approved December 26, 1941. G. S.

10691.... 7– 3–41....United States of America, Forest Service; Unnamed Spring Area; Domestic. Approved December 26, 1941. G. S.

10692.... 7– 3–41....United States of America, Forest Service; Unnamed Spring tributary to Martin Creek; Domestic. Approved December 26, 1941. G. S.

10693.... 7– 3–41....United States of America, Forest Service; Unnamed Spring; Domestic. Approved December 26, 1941. G. S.

10694.... 7– 3–41....United States of America, Forest Service; Kingston Creek; Irrigation.* Withdrawn February 5, 1942.

10695.... 7– 7–41....A. M. Elizalde; Brick Yard Spring; Mining and milling. Canceled January 30, 1942.

10696.... 7– 7–41....A. F. W. Carlson; Morris Creek; Irrigation and domestic.* No action.

*Protested application. G. S. Good standing.

10697.... 7-11-41....E. A. Clark; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. No action.
10698.... 7-11-41....J. N. Bryan; Peak Spring on a branch of Tank Canyon; Watering of stock cattle and horses.* No action.
10699.... 7-11-41....Will S. Heckethorn, also called W. S. Heckethorn; McCoy Creek; Irrigation. Withdrawn October 25, 1941.
10700.... 7-19-41....Contact Mining Company; Brown Station Springs; Mining and milling. Approved October 16, 1941. G. S.
10701.... 7-21-41....The Marigold Mines, Inc.; Trout Creek and Tributaries; Mining, milling, and domestic. Approved December 26, 1941. G. S.
10702.... 7-23-41....Harold J. and Geraldine M. Stocker; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. Approved January 7, 1942. G. S.
10703.... 7-23-41....Lola Heckethorn and J. P. Johansen; Bastian (or Bastion) Creek; Irrigation and domestic. Approved May 12, 1942. G. S.
10704.... 7-30-41....Samuel J. Lawson; Paradise Valley Artesian Basin, Clark County (underground); Irrigation and domestic. Approved December 29, 1941. G. S.
10705.... 7-30-41....Dalton H. Buck; Paradise Valley Artesian Basin, Clark County (underground); Irrigation and domestic. Approved May 5, 1942. G. S.
10706.... 7-30-41....Las Vegas Land & Water Company; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Municipal supply and domestic. Approved December 29, 1941. G. S.
10707.... 7-30-41....Las Vegas Land & Water Company; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Municipal supply and domestic. Approved December 29, 1941. G. S.
10708.... 7-31-41....Caliente Public Utilities; Clover Wash; Municipal. *No action.
10709.... 7-31-41....Chas. E. Barbee and Silvia Barbee; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. No action.
10710.... 7-31-41....W. S. Heckethorn; McCoy Creek; Irrigation and domestic. *Approved April 6, 1942. G. S.
10711.... 8- 1-41....David Holland; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Canceled January 30, 1942.
10712.... 8- 6-41....Harold D. Cornell; Underground source (Pahrump Valley Artesian Basin); Irrigation and domestic. No action.
10713.... 8-13-41....Estella C. Beam; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. Approved January 9, 1942. G. S.
10714.... 8-14-41....George Whittell; Mill Creek or Fourth Creek; Irrigation and domestic. No action.
10715.... 8-20-41....Webb L. Eaton; Sacramento Creek; Mining and domestic. Canceled January 30, 1942.
10716.... 8-22-41....Allye Lawson & Virginia Lawson; (Underground); Paradise Valley Artesian Basin, Clark County; Irrigation and domestic. Approved December 29, 1941. G. S.
10717.... 8-22-41....Max M. Tenesch; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. No action.
10718.... 8-25-41....Thomas E. Hull; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. Approved February 16, 1942. G. S.
10719.... 8-29-41....James and Emily Griel; Unnamed Creek and tributary springs (sometimes called Deadman's Creek); Irrigation and domestic. *No action.
10720.... 9- 5-41....Thomas E. Sharp; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved December 29, 1941. G. S.
10721....9- 5-41....Thomas E. Sharp; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Swimming pool, irrigation and domestic. Approved December 29, 1941. G. S.
10722.... 9- 5-41....Thomas E. Sharp; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Swimming pool, irrigation and domestic. Approved December 29, 1941. G. S.
10723.... 9- 6-41....Robinson Neeman; Four unnamed springs and Grass Lake; domestic and resort. No action.
10724.... 9- 6-41....Joe Gruden; Snake Creek; Power and domestic. *No action.
10725.... 9- 8-41....John Sigurdson; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. No action.
10726.... 9-10-41....E. C. Bradshaw; Underground water; Mining, milling and domestic. Canceled June 11, 1942.
10727.... 9-10-41....E. C. Bradshaw; Underground water; Mining, milling and domestic. Canceled June 11, 1942.
10728.... 9-11-41....H. Levie; Unnamed Spring or water hole; Stockwatering and domestic. *No action.
10729.... 9-12-41....Grace Zopf; Prossors Spring; Irrigation and domestic. Approved December 20, 1941. G. S.

*Protested application. G. S. Good standing.

10730.... 9–13–41....Basic Magnesium Inc.; Underground source; Mining, milling and domestic. Approved March 4, 1942. G. S.
10731.... 9–13–41....Basic Magnesium Inc.; Underground source; Mining, milling, and domestic. Approved March 4, 1942. G. S.
10732.... 9–13–41....Basic Magnesium Inc.; Underground source; Mining, milling, and domestic. Approved March 4, 1942. G. S.
10733.... 9–13–41....William E. Licking; Humboldt River; Irrigation. No action.
10734.... 9–29–41....The Cunningham Realty Company; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. Approved May 11, 1942. G. S.
10735....10– 2–41....A. M. Elizalde; Montezuma Wash; Mining and milling. Canceled June 15, 1942.
10736....10– 2–41....John H. Conaway and James Ryan; Double Reservoir, Delamar Flat West and North Drainage; Stockwatering and domestic. No action.
10737....10– 2–41....Louis Garavanta and Ray Clemmons; Sheehan Springs Nos. 1, 2, and 3; Mining, milling and domestic. No action.
10738....10– 4–41....Joe Gruden; Snake Creek; Mining, milling, and domestic. *No action.
10739....10– 4–41....H. H. Nickel; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); two wells; Quasi-municipal, irrigation and domestic. No action.
10740....10– 6–41....R. A. Coffman; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Domestic, quasi-municipal and irrigation. Approved April 23, 1942. G. S.
10741....10– 6–41....Silver Divide Mines Company; Unnamed Spring; Mining, milling, and domestic. No action.
10742....10–14–41....International Smelting & Refining Company, Copper Canyon Lease; Underground source through a well; Mining, milling, and domestic. Approved April 30, 1942. G. S.
10743....10–14–41....International Smelting & Refining Company, Copper Canyon Lease; Underground source through a well; Mining, milling, and domestic. Approved April 30, 1942. G. S.
10744....10–14–41....International Smelting & Refining Company, Copper Canyon Lease; Underground source through a well; Domestic. Approved April 30, 1942. G. S.
10745....10–14–41....Henry Wick; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved February 27, 1942. G. S.
10746....10–14–41....Consolidated Goldacres Company, a Corporation; An unnamed well; Mining, milling, and domestic. Approved April 23, 1942. G. S.
10747....10–17–41....John H. Conaway; West Oak Springs; Stockwatering and domestic. Approved June 11, 1942. G. S.
10748....10–23–41....J. H. Manson; Unnamed Springs; Mining, milling, and domestic. Approved May 5, 1942. G. S.
10749....10–24–41....F. A. Allen and A. W. Blackman; Cabin Spring; Stockwatering and domestic. No action.
10750....10–24–41....Florence Lawson; Underground source (Paradise Valley Artesian Basin, Clark County); Irrigation and domestic. Approved May 5, 1942. G. S.
10751....10–24–41....M. M. Sweeney; Underground source (Paradise Valley Artesian Basin, Clark County); Irrigation and domestic. Approved May 5, 1942. G. S.
10752....10–27–41....Harvey S. Hale; Cedar Creek; Irrigation. No action.
10753....11– 1–41....C. B. Henderson; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. No action.
10754....11– 3–41....Guy McAfee; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. Approved May 5, 1942. G. S.
10755....11– 7–41....Hubert Eaton; Underground source through three wells; Irrigation, stockwatering, and domestic. Approved April 23, 1942. G. S.
10756....11–12–41....Russell Campbell; Lime Kiln Canyon; Mining, milling, and domestic. No action.
10757....11–15–41....Ivan M. Pinjuv; Underground source through a well (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. No action.
10758....11–20–41....Frank V. and Willie Lee Somerville; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. No action.
10759....11–25–41....Ruth Motley McGuigan; Underground source through McGuigan Well); Irrigation and domestic. No action.
10760....11–29–41....Mary E. Tobin; Crystal Springs; Mining, milling, and domestic. *No action.
10761....12– 8–41....Sebastian Mikilich; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved March 13, 1942. G. S.
10762....12–11–41....Hubert Eaton; Underground source through a well known as Well No. 5; Irrigation, stockwatering, and domestic. Withdrawn December 26, 1941.

*Protested application. G. S. Good standing.

10763....12–12–41....Ralph Moriconi and Louie J. Isola, doing business under the fictitious name of Peoples Market; Underground source through a well; Stockwatering and operating of slaughterhouse. No action.

10764....12–15–41....Emil B. Spitzer; An underground source through an artesian well (Las Vegas Valley Artesian Basin or Subterranean Channel); Domestic and quasi-municipal. Canceled June 15, 1942.

10765....12–17–41....Thomas A. Campbell; Underground source through a well (Las Vegas Valley Artesian Basin or Subterranean Channel); Domestic and Quasi-municipal. No action.

10766....12–29–41....B. H. Robison; Piermont Creek; Irrigation. No action.

10767....12–31–41....Iris O. Burk; Natural springs in a crater; Irrigation and domestic. Canceled June 15, 1942.

10768....12–31–41....Wm. Clark and C. B. Henderson; Waste Water from the disposal plant at McCarran Field (Gunnery School); Irrigation. No action.

10769.... 1– 2–42....Clark C. Johnson; Rattlesnake Spring; Stockwatering. *No action.

10770.... 1– 2–42....Clark C. Johnson; Whiskey Spring; Stockwatering. *No action.

10771.... 1–17–42....Johnson Bros. (Geo. H. Johnson and H. D. Johnson); Martin Creek; Irrigation. Withdrawn March 26, 1942.

10772.... 1–21–42....H. T. Rogers; Reservoir Spring, sometimes called Choke Cherry Spring; Irrigation and domestic. Canceled June 23, 1942.

10773.... 1–23–42....Hubert Eaton; Underground source through a well known as Well No. 6; Irrigation, stockwatering and domestic. Approved April 23, 1942. G. S.

10774.... 1–26–42....Basic Magnesium, Incorporated; A spring; Domestic. *No action.

10775.... 1–26–42....Basic Magnesium, Incorporated; A spring; Domestic. *No action.

10776.... 1–26–42....Basic Magnesium, Incorporated; A spring; Domestic. *No action.

10777.... 1–26–42....Basic Magnesium, Incorporated; A spring; Domestic. *No action.

10778.... 1–26–42....Basic Magnesium, Incorporated; A spring; Domestic. *No action.

10779.... 1–28–42....Defense Plant Corporation; Colorado River; Milling and metallurgical. No action.

10780.... 1–29–42....George A. and Mary E Huntsman; Virgin River; Irrigation. Approved May 21, 1942. G. S.

10781.... 2– 6–42....Edwin J. Miller; Underground water (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic (similar to municipal use). No action.

10782.... 2– 6–42....E. P. Osgood and Howard Brown; Underground source; Irrigation and domestic. No action.

10783.... 2–13–42....J. A. and Pearl Prichard; Flood and winter waters of Robison Canyon and its Tributaries; Irrigation. No action.

10784.... 2–16–42....Louis Pisetta; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. No action.

10785.... 2–18–42....Roy Cram; Underground source through a well (Las Vegas Valley Artesian Basin or Subterranean Channel); Mining, milling, and domestic. No action.

10786.... 2–21–42....Allan L. Drew; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. No action.

10787.... 2–26–42....Leo Pahor; Underground source through a well (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. No action.

10788.... 2–27–42....Mike Broderick; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel) through a well; Quasi-municipal. No action.

10789.... 3– 4–42....John H. Conaway, Press W. Duffin, Sr., and Charles Culverwell; Drainage from Delamar and Cedar Washes and from the area for a distance of about 5 miles south of Cedar Wash draining toward the west; Stockwatering and domestic. No action.

10790.... 3– 6–42....George T. Baker, Baker and Lehman Creeks, high water; Irrigation and domestic. No action.

10791.... 3–11–42....R. B. Griffith; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel) through an artesian well; Irrigation and domestic. No action.

10792.... 3–11–42....Jack Weisberger; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. No action.

10793.... 3–13–42....Durrell Adams and Kay Bunker; Virgin River; Irrigation. No action.

10794.... 3–18–42....William N. Hinson; Underground wash (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. No action.

10795.... 3–21–42....Herbert M. Dixon; Underground source through a well; Irrigation and domestic. No action.

10796.... 3–21–42....Carrara Portland Cement Company; Amargosa River (surface and sub-surface); Manufacturing and domestic. No action.

*Protested application. G. S. Good standing.

10797.... 3–25–42....Henry A. Studwell; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. No action.
10798.... 3–28–42....Las Vegas Land and Water Company; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Municipal supply and domestic. No action.
10799.... 3–28–42....Defense Plant Corporation; Colorado River; Municipal. No action.
10800.... 3–30–42....Manganese Ore Company; Colorado River; Mining, milling, and domestic. No action.
10801.... 4– 1–42....H. T. Rodgers; Big Meadow Slough; Irrigation and stockwatering. No action.
10802.... 4– 1–42....Leonard E. Billman; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. No action.
10803.... 4– 2–42....Basic Magnesium, Incorporated; Underground source; Mining, milling, and domestic. No action.
10804.... 4– 6–42....Leslie Blackburn; Underground source (Deserted Well); Stockwatering and domestic. No action.
10805.... 4– 6–42....George F. Gove; Gove Spring; Irrigation and domestic. No action.
10806.... 4– 9–42....Michael J. Hennesey; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. No action.
10807.... 4–11–42....George Eldridge; Muncy Creek flood water and waste water; Irrigation. No action.
10808.... 4–11–42....George Eldridge; Kalamazoo Creek flood water and waste water; Irrigation. No action.
10809.... 4–11–42....George Eldridge; Spring Valley Wash, flood water and waste water; Irrigation. No action.
10810.... 4–13–42....Leonard W. Hagbery; Five Mile Springs; Irrigation and stockwatering. No action.
10811.... 4–13–42....Joe Erquiaga; Conteninal Lake; Irrigation. No action.
10812.... 4–13–42....John E. Stout and Lee Keller; Unnamed Creek; Mining, milling, and domestic. No action.
10813.... 4–16–42....Thomas A. Campbell; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. No action.
10814.... 4–20–42....Paul Stewart, Ernie Higbee and Lawrence Sharp; East and South Sheep Mt. Dry Channels; Stockwatering. No action.
10815.... 4–27–42....W. A. Unangst and J. C. Anderson; Log Spring; Mining and milling. No action.
10816.... 4–27–42....W. A. Unangst and J. C. Anderson; Cucomongo Spring; Mining and milling. No action.
10817.... 4–27–42....Henry Esplin; Bassett Creek; Irrigation. No action.
10818.... 4–27–42....Opaco Lumber and Realty Company, a Nevada Corporation, incorporated December 27, 1941; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Manufacturing, fire protection, and domestic. No action.
10819.... 4–28–42....Georgiana Brearley; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Domestic. No action.
10820.... 4–28–42....Clark County Land Company, Inc., a Nevada Corporation; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. No action.
10821.... 4–28–42....Clark County Land Company, Inc.; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. No action.
10822.... 5– 6–42....Allison Smith, by Dennis Smith, Attorney in Fact; Underground source; Irrigation, stockwatering, and domestic. No action.
10823.... 5– 7–42....Mary C. Gaddis; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation, quasi-municipal and domestic. No action.
10824.... 5– 8–42....Angelo C. Florio; "Holly Well"; Stockwatering and domestic. No action.
10825.... 5–15–42....M. E. Ward and D. H. Johnston; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. No action.
10826.... 5–15–42....M. E. Ward and D. H. Johnston; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal. No action.
10827.... 5–19–42....Andy Pastorino, Sr., Andy Pastorino, Jr., and Henry Pastorino; Underground source; Stockwatering and domestic. No action.
10828.... 5–20–42....Louis Wiener, Jr.; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Quasi-municipal and domestic. No action.
10829.... 5–25–42....J. N. Hawkins and Helen V. Hawkins; Churchill Canyon and Tributaries; Irrigation and domestic. No action.
10830.... 5–26–42....R. J. Kaltenborn; Underground source (Las Vegas Valley Underground Artesian); Irrigation, quasi-municipal and domestic. No action.

*Protested application. G. S. Good standing.

10831.... 5-29-42....James Hunter; Underground—Government Well about 7 miles northwest of Eureka Court House; Watering stock, except sheep. No action.
10832.... 6- 8-42....Grover C. Jackson; Underground source; Irrigation and domestic. No action.
10833.... 6- 9-42....Frederick Steigmeyer; Shoshone Creek; Mining (domestic use incidental). No action.
10834.... 6-11-42....Security Industrial Corporation; Juniata Springs; Domestic, camp, and milling. No action.
10835.... 6-11-42....Emery E. Garrett; Troy Creek; Stockwatering and domestic. No action.
10836.... 6-11-42....Emery E. Garrett; Unnamed Spring; Stockwatering and domestic. No action.
10837.... 6-11-42....Emery E. Garrett; Goat Ranch Spring; Stockwatering and domestic. No action.
10838.... 6-12-42....E. C. Bradshaw; Underground water; Mining, milling, and domestic. No action.
10839.... 6-12-42....E. C. Bradshaw; Underground water; Mining, milling, and domestic. No action.
10840.... 6-13-42....E. A. Clark, E. H. Wallace and Frank Wallace; Underground source; Milling and domestic. No action.
10841.... 6-19-42....Hotels El Rancho, Inc., DBA Hotel Last Frontier; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation, domestic and fire protection. No action.
10842.... 6-20-42....H. T. Rogers; Reservoir Spring, sometimes called Choke Cherry Spring; Irrigation and domestic. No action.
10843.... 6-22-42....B. H. Robison; Bassett Creek Slough; Irrigation. No action.
10844.... 6-24-42....A. C. Delkin; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Manufacturing and domestic. No action.

*Protested application. G. S. Good standing.

CHAPTER XIX

Status of Applications Filed Prior to July 1, 1940

Status of applications filed prior to July 1, 1940, upon which action has been taken during the present biennium.

Following is a condensed statement giving the salient data in connection with applications filed prior to July 1, 1940, upon which action has been taken during the years of the present biennium, in the order of:

1. Application serial number.
2. Date of filing.
3. Name of applicant.
4. Source of water supply.
5. Purpose of appropriation.
6. Action on application.
7. Status of permits as of June 30, 1942.

1663.... 4-18-10....I. Cohn; All flood or surplus waters of West Walker River; Irrigation. Canceled October 21, 1940.
3179....11-23-14....Rosa A. Hanna; Smith and Cottonwood Creeks; Irrigation. Canceled January 13, 1941.
3569.... 9- 7-15....Ira MacFarland; Underground source; Irrigation. Canceled October 21, 1940.
3851.... 3-29-16....J. L. Sharp and H. L. Sharp; Pahranagat Lake; Irrigation. Canceled February 28, 1941.
4513.... 7-18-17....Wm. J. Robinson; Pahranagat Lake; Irrigation.* Denied March 6, 1941.
5056.... 5- 6-18....E. R. Allred; The Four Springs; Irrigation and Domestic. Canceled October 21, 1940.
5140.... 7- 6-18....The Gerlach Livestock Company; Cottonwood Creek; Irrigation. Canceled April 6, 1942.
5260.... 9-24-18....Carl John Anderson; Blue Lead Creek; Irrigation and domestic. Canceled April 6, 1942.
5362.... 1-17-19....Roger D. Dougherty, John E. Nay and William J. Douglass; Willow Creek; Irrigation. Canceled November 25, 1941.
5379.... 2- 1-19....Gust G. Rahas; Lamoille Creek; Irrigation. Canceled October 21, 1940.
5628.... 7-21-19....Samuel S. Arentz; Burbank Canyon or Creek; Irrigation and domestic.* Canceled April 6, 1942.
5701.... 9- 2-19....John H. Cahill; Steiner Canyon Creek; Mining, milling, and domestic. Canceled April 6, 1942.
5760.... 9-23-19....Alice S. MacFarland; Mesquite Springs; Irrigation and stockwatering. Canceled March 5, 1941.
5761.... 9-23-19....Alice S. MacFarland; Underground source through a drilled well; Irrigation and stockwatering. Canceled March 5, 1941.
5762.... 9-23-19....Alice S. MacFarland; Twin Springs; Irrigation and stockwatering. Canceled March 5, 1941.
5812....10-18-19....Frank V. Perry; Cottonwood Creek, flood and unappropriated waters; Irrigation, stockwatering, and domestic. Canceled October 24, 1940
5969.... 2- 2-20....O. R. Perry; Five Mile Springs; Irrigation, stockwatering, and domestic. Canceled October 24, 1940.
6052.... 4-10-20....Gerlach Livestock Company, a Corporation; Cottonwood Creek; Irrigation. Canceled October 21, 1940.
6126.... 5-17-20....Benjamin C. Grainger; Maynard Lake and Tributaries; Irrigation.* Denied March 6, 1941.
6171.... 6-16-20....Geo. K. Riding and Benjamin C. Grainger; Maynard Spring; Domestic.* Denied March 6, 1941.
6186.... 6-23-20....J. B. Gallagher, et al.; Walker River; Irrigation, stockwatering, and domestic. Canceled October 21, 1940.
6296....10-11-20....Lay Land & Stock Co.; Shanks Canon; Irrigation and stockwatering. Approved December 29, 1941. G. S.
6352....12- 6-20....Tony Longero; Blossom Springs; Irrigation and domestic. Withdrawn October 4, 1940.
6393.... 2- 4-21....Maynard Irrigation Company; Combined water of Hiko, Crystal, and Ash Springs below their confluence; water during winter months only applied for; Irrigation and domestic.* Denied March 6, 1941.
6447.... 4-27-21....Mrs. C. W. Newman and Asa M. Cline; German Springs; Stockwatering.* Approved May 20, 1941. G. S.
6515.... 7-16-21....Joseph Taylor; Dorsey Creek, including its Tributaries; Irrigation and domestic. Canceled October 21, 1940.

*Protested application. G. S. Good standing.

6531.... 8– 6–21....Ed. Malley, Trustee, for Ed. Malley, Parvin P. Jones, Robert A. Allen and L. B. Hawkins; Beatty Springs; Power and domestic. Canceled February 28, 1941.
6609.... 1– 9–22....Gardner Ranch Co.; Frenchy Lake; Irrigation. Denied April 1, 1941.
6636.... 2–27–22....Jerome Borer; Amargosa River; Underground flow, including its tributaries, Gold Gulch and Indian Creek; Irrigation and domestic. Canceled April 6, 1942.
6657.... 3–29–22....J. M. Prunty and Guy B. Prunty; Virgin River; Irrigation. Canceled May 21, 1941.
6743.... 8–12–22....Fallon Land & Stock Co.; Marble Falls Springs; Stockwatering and domestic. Canceled October 3, 1940.
6758.... 9– 6–22....Walter B. Conk; Meadow Valley Wash; Irrigation. Canceled April 6, 1942.
6899.... 5–10–23....D. D. Sabala; Peacock Well; Stockwatering and domestic. Canceled April 6, 1942.
6923.... 6–27–23....John D. Callahan; A spring in Charlie Creek Canyon, flowing, at times, into Charlie Creek; the latter flowing, when it can reach it, into Woodward Creek, watering Callahan Ranch; Stockwatering. Canceled October 21, 1940.
6926.... 6–29–23....John D. Callahan; Charlie Creek, flowing for a greater or less period each year, into Woodward Creek, watering Callahan Ranch; Stockwatering. Canceled October 21, 1940.
6927.... 7– 2–23....Ira MacFarland; Sawmill Springs; Power. Withdrawn November 29, 1940.
6928.... 7– 2–23....Ira MacFarland; Brady Springs; Power. Withdrawn November 29, 1940.
6929.... 7– 2–23....Ira MacFarland; Owens Springs; Power. Withdrawn November 29, 1940.
6930.... 7– 2–23....Ira MacFarland; Stratton Springs; Power. Withdrawn November 29, 1940.
6931.... 7– 2–23....Ira MacFarland; Cold Creek; Power. Withdrawn November 29, 1940.
6932.... 7– 2–23....Ira MacFarland; MacFarland Springs; Power. Withdrawn November 29, 1940.
6933.... 7– 2–23....Ira MacFarland; Willow Creek; Power. Withdrawn November 29, 1940.
6943.... 7–23–23....Carr, Cornell & Hesse; Green Springs Nos. 1 and 2; Stockwatering.* Denied April 4, 1941.
6944.... 7–25–23....D. D. Sabala; Willow Well; Stockwatering. Canceled April 6, 1942.
6945.... 7–25–23....D. D. Sabala; Sabala No. 10 Well; Stockwatering. Canceled April 6, 1942.
6946.... 7–25–23....D. D. Sabala; Eyroz Well; Stockwatering. Canceled April 6, 1942.
6948.... 7–27–23....D. D. Sabala; Sabala No. 9 Well; Stockwatering. Canceled April 6, 1942.
6989....10–17–23....Jose Iragui; A spring; Stockwatering.* Canceled October 21, 1940.
7000....11–10–23....Jose Iragui; A spring; Stockwatering. Canceled October 21, 1940.
7062.... 3–13–24....R. B. Stewart; Pompernickel Spring and Creek; Irrigation and domestic. Canceled October 21, 1940.
7138.... 6–17–24....Ada B. Rennie & Helena L. Waldron; Humboldt River; Irrigation.* Canceled November 25, 1941.
7166.... 7–10–24....Pete Olabarria; Unnamed well; Stockwatering and domestic. Canceled April 6, 1942.
7203.... 8–27–24....Archie Daniels and Deforest Flint; Jeff Davis Spring; Stockwatering and domestic.* Canceled February 28, 1941.
7204.... 8–27–24....Archie Daniels and Deforest Flint; Valcalda Springs; Stockwatering and domestic.* Canceled February 28, 1941.
7229....10–15–24....Dean Ranch; Little Cottonwood Creek; Irrigation. Canceled November 25, 1941.
7275....12–31–24....Gilbert Last Hope Gold Mines Company; A spring, commonly called "Cook Springs"; Mining, milling, and domestic. Canceled November 25, 1941.
7349.... 5– 1–25....Jose Iragui; A spring; Stockwatering.* Canceled October 21, 1940.
7350.... 5– 1–25....Jose Iragui; Summit Spring; Stockwatering.* Canceled October 21, 1940.
7351.... 5– 1–25....Jose Iragui; Near the head of Rock Creek by excavating and developing; Stockwatering.* Canceled October 21, 1940.
7382.... 5–23–25....J. C. Wholey; An unnamed spring on the northwest side of Red Mountain about three miles east of Wholey Ranch; Stockwatering.* Approved December 23, 1941. G. S.
7383.... 5–23–25....J. C. Wholey; An unnamed spring now called Rock Spring, three to four miles west of Mrs. Wholey's Land Claim on range used for cattle; Stockwatering.* Approved December 23, 1941. G. S.
7387.... 6– 1–25....J. C. Wholey; Unnamed spring; Stockwatering.* Approved December 23, 1941. G. S.
7400.... 6–18–25....J. C. Wholey; Red Mountain Spring No. 2; Stockwatering.* Approved December 23, 1941. G. S.
7401.... 6–18–25....J. C. Wholey; Red Mt. No. 4 Spring; Stockwatering.* Approved December 23, 1941. G. S.
7475.... 8–10–25....Joe Gruden; Underground water of Gruden Spring, developed; Irrigation and domestic. Canceled April 6, 1942.

*Protested application. G. S. Good standing.

7500.... 9– 8–25....J. C. Wholey; Addington or Red Mt. Spring; Stockwatering.* Approved December 23, 1941. G. S.
7512.... 9–26–25....Laborde Bros. & Company, a Copartnership; Granite Spring No. 1; Stockwatering.* Approved December 23, 1941. G. S.
7513.... 9–26–25....Laborde Bros. & Company, a Copartnership; Blue Rock Spring; Stockwatering.* Approved December 23, 1941. G. S.
7514.... 9–26–25....Laborde Bros. & Company, a Copartnership; Placer Gulch Spring; Stockwatering.* Approved December 23, 1941. G. S.
7543....10– 7–25....J. C. Wholey; Dry Creek Springs; Stockwatering.* Approved December 23, 1941. G. S.
7544....10– 7–25....J. C. Wholey; Summit Spring; Stockwatering.* Approved December 23, 1941. G. S.
7638.... 2– 9–26....Minnie Mae Wholey; Underground water through a well; Irrigation, stockwatering, and domestic. Approved December 23, 1941. G. S.
7666.... 3–16–26....Albert J. McMillen; Buffalo Creek; Irrigation and Domestic.* Canceled February 28, 1941.
7671.... 3–23–26....Albert F. McMillen; Pine Creek; Irrigation and Domestic.* Canceled November 25, 1941.
7674.... 3–27–26....W. H. Millinghausen; Petrified Spring; Stockwatering. Approved November 4, 1940. G. S.
7750.... 5–13–26....E. R. Allred; Warm Springs; Irrigation and domestic.* Denied January 28, 1941.
7817.... 7– 8–26....Warrior Gold Mining Company; Granite Spring; Mining, milling, and domestic. Canceled May 14, 1941.
7834.... 7–31–26....Levi W. Syphus as Trustee for Nevada Irrigation Company on behalf of A. T. Stewart, H. B. Stewart, Paul Stewart, Emma A. McCollough and Carl Nachtrieb; Rio Virgin River; Irrigation and domestic. Denied May 7, 1941.
7963.... 1– 8–27....John T. Elder; Willow Creek Canon; Irrigation. Canceled Novemuer 25, 1941.
7993.... 2– 3–27....Ira MacFarland; Brady Springs; Irrigation and domestic. Withdrawn November 29, 1940.
7994.... 2– 3–27....Ira MacFarland; Owens Springs; Irrigation and domestic. Withdrawn November 29, 1940.
7995.... 2– 3–27....Ira MacFarland; MacFarland Springs; Irrigation and domestic. Withdrawn November 29, 1940.
7996.... 2– 3–27....Ira MacFarland; Sratton Springs; Irrigation and domestic. Withdrawn November 29, 1940.
7997.... 2– 3–27....Ira MacFarland; Sawmill Springs; Irrigation and domestic. Withdrawn November 29, 1940.
7998.... 2– 3–27....Ira MacFarland; Willow Creek Spring; Irrigation. Withdrawn November 29, 1940.
8052.... 3–25–27....George H. Eldridge; Want Spring; Stockwatering.* Approved January 7, 1942. G. S.
8106.... 4–22–27....F. J. Powers & Son; High Rock Creek; Irrigation and domestic. Canceled April 6, 1942.
8107.... 4–22–27....F. J. Powers & Son; Hanging Rock Creek; Irrigation and domestic. Canceled April 6, 1942.
8108.... 4–22–27....F. J. Powers & Son; High Rock Creek; Irrigation and domestic. Canceled April 6, 1942.
8124.... 5– 6–27....Elizabeth S. Barndt; Summit Springs; surplus water; Stockwatering and domestic. Canceled October 23, 1941.
8125.... 5– 6–27....Elizabeth S. Barndt; Surplus flow at two springs at Summit Station Tank; Stockwatering. Canceled October 23, 1941.
8126.... 5– 6–27....Elizabeth S. Barndt; Hicks Spring surplus flow; Irrigation. Canceled October 23, 1941.
8138.... 5–22–27....George W. O'Neill; Spring near Mt. Ann; Stockwatering and domestic. Canceled February 3, 1941.
8178.... 6–17–27....Texas A. McCall; Big Spring, Nye County; Irrigation and domestic. Canceled November 16, 1940.
8179.... 6–17–27....Texas A. McCall; Fairbanks Spring; Irrigation and domestic. Canceled November 16, 1940.
8205.... 6–29–27....John M. Bunker; Meadow Valley Creek Wash; Irrigation. Canceled April 6, 1942.
8245.... 7–20–27....Griswold-Henderson Livestock Company; Eagle Rock Spring; Stockwatering. Canceled April 6, 1942.
8439.... 1–28–28....Bessie Buster; Unnamed Springs (an eastern tributary of Hay Meadow Creek); Stockwatering. Canceled October 21, 1940.
8440.... 1–28–28....Bessie Buster; Buster Springs; Stockwatering. Canceled October 21, 1940.
8457.... 2–20–28....W. C. Pitt Company; Say Canyon and Springs (East Fork); Stockwatering and domestic. Canceled February 28, 1940.
8458.... 2–20–28....W. C. Pitt Company; French Boy Canyon and Springs; Stockwatering and domestic. Canceled November 25, 1941.
8467.... 3– 2–28....P. G. Morgan; Chipmonk or Knapp Springs; Stockwatering and domestic.* Approved May 27, 1941. G. S.
8496.... 4– 4–28....Joe Saval; Blue Lead Spring; Stockwatering and domestic.* Canceled April 6, 1942.
8508.... 4–19–28....D. F. Capell; Wild Horse Spring; Stockwatering and domestic. Approved November 4, 1940. G. S.
8510.... 4–19–28....D. F. Capell; Gillis Spring; Stockwatering and domestic. Approved November 4, 1940. G. S.

*Protested application. G. S. Good standing.

8537.... 5-14-28....B & B Quick Company, by its agent, Ed. S. Giles; Trail Creek, on west slope of Fish Lake Valley; mining and domestic. Canceled November 25, 1941.
8599.... 6-23-28....Donnelly Land and Livestock Company; Sheep Spring and Creek; Stockwatering and domestic. Canceled February 4, 1941.
8621.... 7-17-28....Joe Saval; Mud Springs; Stockwatering and domestic.* Canceled April 6, 1942.
8692.... 9-14-28....Weiss & Vogel; Underground source through artesian wells; Irrigation. Canceled April 6, 1942.
8699.... 9-17-28....Gerald A. Smith; Underground source through artesian wells; Irrigation. Canceled December 4, 1941.
8737....10-26-28....R. T. Evans; Unnamed spring; Stockwatering.* Canceled April 6, 1942.
8798....12-21-28....Alex Duferrena; Antelope Springs; Irrigation and domestic. Canceled November 25, 1941.
8802.... 1- 2-29....W. C. Pitt Company; West Fork Say Canyon Springs and Creek; Stockwatering and domestic. Canceled February 28, 1940.
8866.... 4-16-29....Charles R. Brownlow; Virgin River; Irrigation and domestic. Denied May 7, 1941.
8870.... 4-19-29....James B. Gibson; Battle Spring No. 3; Stockwatering and domestic. Withdrawn December 5, 1941.
8885.... 4-27-29....Hans Johnson; Underground source through an artesian well; Irrigation and domestic. Canceled November 25, 1941.
8902.... 5-13-29....Frank Childress; Childress Spring; Mining, milling, and domestic.* Canceled April 6, 1942.
8981.... 7- 5-29....Lee E. Pitts; Underground Seep on Dry Creek; Mining and domestic. Withdrawn March 29, 1941.
8987.... 7-11-29....E. E. Woodruff; Little High Rock Creek; Irrigation, stockwatering, and domestic. Canceled April 6, 1942.
8988.... 7-11-29....E. E. Woodruff; Little High Rock Creek; Irrigation and domestic. Canceled April 6, 1942.
9035.... 8-16-29....Mort Hulery; Champion Creek; Irrigation. Canceled November 25, 1941.
9184....12-20-29....Laborde Bros. & Co.; Underground water through Laborde Well No. 1; Stockwatering.* Approved December 23, 1941. G. S.
9197.... 1- 7-30....Laborde Bros. & Co.; Underground source through Laborde Well No. 2; Stockwatering.* Approved December 23, 1941. G. S.
9236.... 4-12-30....Laborde Bros. & Co.; Underground source through Laborde Well No. 5; Stockwatering.* Approved December 23, 1941. G. S.
9241.... 4-16-30....John W. Cole and Philip J. Dolan; Wilson Creek and its Tributaries, including Hidden Treasure Spring; Irrigation and domestic.* Canceled November 25, 1941.
9249.... 4-25-30....Clel E. Georgetta; Spring Creek; Stockwatering and domestic. Withdrawn December 5, 1941.
9255.... 5-11-30....Rhyolite Consolidated Mines Company; Upper Indian Springs Nos. 1, 2, and 3; Mining, milling, and domestic. Canceled March 10, 1941.
9270.... 6- 9-30....R. H. Rowland; Unnamed Spring; Mining, milling, and domestic.* Canceled November 25, 1941.
9319.... 8-20-30....W. D. Spencer; Artesian Well to be known as Hermon Well; Irrigation and domestic. Canceled April 6, 1942.
9329.... 9- 8-30....Mose Butti; Butti Well; Irrigation. Canceled November 25, 1941.
9332.... 9-11-30....Leon Acorda; Underground source through Acorda Well No. 2; Stockwatering. Canceled July 16, 1940.
9347....10-12-30....The Rhyolite Consolidated Mines Company; Indian Springs Nos. 7 and 8; Mining, milling, and domestic. Canceled March 10, 1941.
9348....10-12-30....The Rhyolite Consolidated Mines Company; Upper Indian Springs Nos. 4, 5, and 6; Mining, milling, and domestic. Canceled March 10, 1941.
9358....10-26-30....George Weilmunster; Cold Spring Slide Creek; Irrigation and domestic. Canceled April 6, 1942.
9367....11- 5-30....The F. W. Noble and Smith Sheep Company; Underground source through Ruby Valley Well No. 3; Stockwatering and domestic. Canceled November 25, 1941.
9494.... 7- 3-31....Gartiez Bros.; Bilk Creek; Stockwatering.* Canceled December 4, 1941.
9522.... 9- 1-31....Thomas L. Williams; Underground source (Las Vegas Artesian Basin or Subterranean Channel) through three artesian wells; Irrigation and domestic. Canceled October 21, 1940.
9536....10- 1-31....Gartiez Bros.; Summit Spring; Stockwatering.* Canceled December 4, 1941.
9540....10-13-31....C. H. Taylor; Taylor Spring No. 1; Stockwatering and domestic. Canceled April 6, 1942.
9604.... 6-25-32....Gartiez Bros.; East Fork Bilk Creek; Stockwatering.* Canceled December 4, 1941.
9646.... 2-20-33....R. H. Cowles and H. Howes; Big Mouth Creek, White Horse Mining District, Washoe County; Mining, milling, and domestic.* Canceled April 6, 1942.
9664.... 5-31-33....Vivian K. Mariger; Meadow Valley Wash Stream; Irrigation.* Withdrawn December 9, 1940.
9679.... 7-17-33....Interstate Mining & Development Company; March Spring; Mining, milling, and domestic. Canceled November 25, 1941.
9690.... 8-22-33....Dr. P. M. Willemin; McCarthy Springs (2); Mining, milling, and domestic.* Canceled April 6, 1942.

*Protested application. G. S. Good standing.

9692.... 9– 5–33....Harry Springer; Farrington Spring; Mining and milling. Canceled April 6, 1942.
9693.... 9– 5–33....Harry Springer; Pepper Springs; Mining, milling, and domestic. Canceled April 6, 1942.
9699.... 9–27–33....Dud R. Day; Underground water; Mining, milling, and domestic. Canceled November 25, 1941.
9787.... 8– 9–34....Edward Parr, P. J. Feykert, and Charles Dickinson; Underground water; Mining, milling, and domestic. Canceled February 28, 1941.
9793.... 8–27–34....W. B. Adams; Adams Reservoir No. 2; Stockwatering and domestic.* Denied June 8, 1942.
9794.... 8–27–34....W. B. Adams; Adams Reservoir No. 1; Stockwatering and domestic.* Denied June 8, 1942.
9795.... 8–31–34....Roy Leach; West Ohio Spring; Mining, milling, and domestic.* Denied June 8, 1942.
9807....10–10–34....Garteiz Bros.; Bilk Creek and Tributary Springs and Creek, now known as Trail Springs and Creek; Stockwatering and domestic.* Canceled December 4, 1941.
9808....10–10–34....Garteiz Bros.; A Creek and Springs, now known as Garteiz' Springs and Creek; Stockwatering and domestic.* Canceled December 4, 1941.
9809....10–10–34....Garteiz Bros.; Bilk Creek and Tributary Springs and Creek, now known as Lovely Valley Springs and Creek; Stockwatering and domestic.* Canceled December 4, 1941.
9817....11–15–34....W. N. Bowen; Dry Gulch Creek; Mining and domestic.* Canceled February 28, 1941.
9819....11–24–34....C. R. Townsend; Woodman Springs; Mining, milling, and domestic.* Canceled September 25, 1940.
9839.... 2–25–35....Henry C. Esplin; White River Channel; Stockwatering.* Denied January 11, 1941.
9848.... 3–27–35....Edward Parr, P. J. Feykert and Chas. Dickinson; Underground water; Mining, milling, and domestic. Canceled February 28, 1941.
9865.... 6– 3–35....The Goldpoint Mining & Milling Company; Lida Canyon (underground water); Milling. Canceled November 25, 1941.
9867.... 6–11–35....James Scossa, Happy Creek Springs; Mining, milling, and domestic. Canceled October 21, 1940.
9868.... 6–12–35....W. J. Wadhams; Massacre Lake and Unnamed Tributaries; Irrigation and domestic. Canceled December 18, 1940.
9869.... 6–19–35....Ralph McInerny; Springs and underground water; Mining, milling, and domestic. Canceled February 28, 1941.
9870.... 6–19–35....Ralph McInerny; Underground Water; Mining, milling, and domestic. Canceled February 28, 1941.
9871.... 6–22–35....Boulder Dam Custom Mills, Inc.; Underground source (a dug well 30 feet depth near west bank of Colorado River on Skulerk Millsite); Custom ore mill and domestic. Withdrawn March 27, 1941.
9874.... 6–27–35....The City of Winnemucca, Nevada; Underground water through City Well No. 1; Municipal. Canceled March 15, 1941.
9875.... 7– 2–35....Lester F. Scott, Jr.; Indian Spring; Mining, milling, and domestic. Canceled April 6, 1942.
9884.... 7–29–35....C. W. Benton; Underground flow of Tule Canyon; Mining and milling.* Canceled October 21, 1940.
9889.... 8– 7–35....T. O. Boyd, Sr.; Unnamed Spring; Mining. Canceled November 25, 1941.
9895.... 9– 3–35....Fred L. and Iva Wilson; Warm Spring, sometimes called Hot Spring; Irrigation and domestic.* Approved February 20, 1941. G. S.
9911....11– 2–35....Lindgren & Swinnerton; Antelope Creek; Mining, milling, and domestic.* Withdrawn March 3, 1941.
9917—12–13–35....Frank Thorley; Flood Water of White River Wash; Stockwatering.* Denied January 11, 1941.
9933.... 1–31–36....Harry McNamara, by his agent, Ed. S. Giles; Unnamed Seep, underground flow; Mining and milling. Canceled September 5, 1940.
9934.... 1–31–36....Western Mineral Exploration Company; Underground Water of Limerick Canyon; Mining, milling, and domestic. Canceled April 6, 1942.
9938.... 2– 6–36....Ed. Halstead & Bessie R. Shannon; Monte Cristo Spring; Stockwatering.* Approved July 30, 1940. G. S.
9941.... 2–21–36....Alex Kolchek; Stines Spring; Mining, milling, and domestic. Canceled November 25, 1941.
9973.... 3–27–36....D. M. Wheeler; Sutro Springs; Stockwatering and domestic.* Canceled April 10, 1942.
9980.... 4–16–36....L. M. McArthur; Cottonwood Creek and Tributaries; Irrigation and domestic.* Denied November 13, 1941.
9990.... 6– 2–36....Austin Silver Mining Company; Underground water through a well; Milling and domestic. Canceled November 25, 1941.
10005.... 7–31–36....W. A. Hutts; Rabbit Hole Springs and Channel; Placer mining and domestic. Canceled October 21, 1940.
10006.... 8– 3–36....Bert Jarvis; Van Duzer Creek; Power. Canceled October 21, 1940.
10011.... 8–12–36....Caesar Regusci; Brown Station Spring; Irrigation and domestic. Canceled February 28, 1941.

*Protested application. G. S. Good standing.

10016.... 8–18–36....I. L. Davis; Whiskey Springs and Tributaries; Mining, milling, and domestic. Denied September 30, 1940.
10017.... 8–18–36....I. L. Davis; Blue Point Springs and Tributaries; Mining, milling and domestic. Denied September 30, 1940.
10018.... 8–27–36....L. R. Smith, by R. N. Hunt; Underground waters of Big Smoky Valley through Well No. 1; Mining, milling, and domestic. Denied September 30, 1940.
10021.... 9–15–36....Henry L. Schruefer and William R. Freiler; Amargosa River, underground flow to be developed; Mining and milling. Canceled April 6, 1942.
10034....10– 8–36....D. H. Livingston; Muddy River; Power. Denied April 4, 1942.
10050....11– 6–36....L. R. Smith, by R. N. Hunt; Underground waters of Big Smoky Valley; Mining, milling, and domestic. Denied September 30, 1940.
10051....11– 6–36....L. R. Smith, by R. N. Hunt; Underground waters of Big Smoky Valley; Mining, milling, and domestic. Denied September 30, 1940.
10052....11– 6–36....L. R. Smith, by R. N. Hunt; Underground waters of Big Smoky Valley; Mining, milling, and domestic. Denied September 30, 1940.
10055....11–23–36....Richard Kirman; Marlette Creek, Main North Fork; Irrigation and domestic. Withdrawn by applicant April 4, 1941.
10076.... 2– 6–37....The Utah Construction Company; Underground source; Stockwatering. *Withdrawn June 5, 1942.
10082.... 2– 6–37....The Utah Construction Company; Underground source; Stockwatering. Withdrawn June 5, 1942.
10083.... 2– 6–37....The Utah Construction Company; Underground source; Stockwatering. *Withdrawn June 5, 1942.
10084.... 2– 6–37....The Utah Construction Company; Underground source; Stockwatering. *Withdrawn June 5, 1942.
10118.... 5–17–37....Preston Irrigation Co.; White River; Irrigation. Approved June 9, 1941. G. S.
10123.... 5–25–37....E. L. Mason; Tammarack Springs; Medicinal and Bathing. Canceled April 6, 1942.
10131.... 6–23–37....F. R. Bechdolt & L. E. Gottfried; Bonita Creek; Mining and milling. *Denied October 26, 1940.
10133.... 6–23–37....Cecil D. Terwilliger; Unnamed Spring; Mining and domestic. *Withdrawn November 22, 1940.
10137.... 7– 6–37....Maurice J. Waller and James R. Martin; Gap Spring, Fish Lake Valley; Mining and milling. Canceled April 3, 1941.
10138.... 7– 6–37....Maurice J. Waller & James R. Martin; Underground source through a well; Mining and milling. Canceled April 3, 1941.
10141.... 7–17–37....Echo Canyon Mining Company; Unnamed Spring; Mining, milling and domestic. Canceled October 21, 1940.
10148.... 8– 4–37....Harold J. Stocker; Underground Waters; Washing Sand and Industrial. Canceled October 21, 1940.
10162.... 9– 7–37....George Whittell; North Fork of Marlette Creek and Springs; Power and domestic. Withdrawn March 1, 1941.
10165.... 9– 7–37....U. S. Forest Service; Stanley B Creek; Domestic and public use. Withdrawn March 11, 1942.
10184....10–30–37....Eddie Barry; Manse Spring and its Tributaries; Irrigation and domestic. Denied May 12, 1941.
10190....12– 8–37....Copper Canyon Mining Company; Underground Water; Mining, milling, and domestic. Withdrawn January 7, 1941.
10196.... 1– 4–38....C. B. Stark; Underground waters through a well; Stockwatering and domestic. Approved June 9, 1941. G. S.
10198.... 1–17–38....George F. Worts; Corn Creek Springs; Irrigation and domestic. Canceled April 6, 1942.
10199.... 1–21–38....John A. Jordan and James F. Anderson; Colorado River; Quartz mill and domestic. Canceled November 25, 1941.
10208.... 2–10–38....Ellison Ranching Company, Spanish Ranch; Flood waters and unappropriated waters of Willow Creek; Irrigation. *Approved January 23, 1941. G. S.
10238.... 4– 8–38....South Comstock Tailings Disposal Company; Gold Canyon Creek; Tailings Disposal. *Approved August 21, 1940. G. S.
10262.... 7–12–38....John B. Lamb; Summit Creek; Placer mining. *Denied June 24, 1942.
10263.... 7–13–38....U. S. Forest Service; Rainbow Creek; Public Campgrounds and domestic. *Withdrawn December 22, 1941.
10264.... 7–13–38....U. S. Forest Service; Snow Slide Spring; Public and domestic. Withdrawn March 28, 1942.
10266.... 7–14–38....Mrs. Frances B. Moore; Colorado River; Mining, milling, and domestic. Canceled March 5, 1941.
10267.... 7–14–38....Lois Kellogg II; Six Mile Manse Spring; Stockwatering and domestic. Approved August 26, 1940. G. S.
10278.... 7–25–38....Nevada Gold Production Company; Strawberry Creek; Placer mining. *Denied June 8, 1942.
10281.... 8–11–38....John B. Lamb; Summit Creek; Mining. *Denied June 24, 1942.
10286.... 8–16–38....A. Pincolini and O. M. Todd; Tunnel Spring No. 1; Mining, milling, and domestic. Denied September 30, 1940.
10287.... 8–16–38....A. Pincolini and O. M. Todd; Tunnel Spring No. 2; Mining, milling, and domestic. Denied September 30, 1940.
10298.... 9–28–38....E. B. Salinas; Sacramento Creek; Irrigation and domestic. *Approved June 24, 1942.

*Protested application. G. S. Good standing.

10300....10– 1–38....J. W. R. Hilliard; Amargosa River (surface and sub-surface); Irrigation and domestic. *Approved November 25, 1940. G. S.
10303....10–14–38....Lois Kellogg II; Unnamed Spring (Kellogg Spring); Stockwatering and domestic. Approved August 26, 1940. G. S.
10308....11–30–38....J. N. Bryan; Lidi Tunnel Spring; Stockwatering. *Approved December 13, 1940. G. S.
10314....12–15–38....J. N. Bryan; Jack Springs; Stockwatering. *Approved April 30, 1941. G. S.
10315....12–15–38....J. N. Bryan; Marble Falls Springs Creek; Stockwatering. *Approved December 13, 1940. G. S.
10316....12–15–38....J. N. Bryan; Ottaway Spring; Stockwatering. Approved March 17, 1941. G. S.
10317....12–15–38....J. N. Bryan; Green Springs; Stockwatering. *Approved April 30, 1941. G. S.
10318....12–16–38....Afterthought Mines Corporation; Unnamed Spring; Mining and domestic. *Approved September 11, 1940.
10319....12–16–38....Afterthought Mines Corporation; Unnamed Spring; Mining and domestic. *Approved September 11, 1940.
10332.... 1– 3–39....Henry J. Crohs; Garfield Springs, surplus and unappropriated water; Mining, milling, and domestic. Denied May 13, 1941.
10347.... 3–24–39....The Utah Construction Company; Underground source; Stockwatering. Approved August 2, 1940. G. S.
10348.... 3–24–39....The Utah Construction Company; Underground source; Stockwatering. Approved August 2, 1940. G. S.
10373.... 4–29–39....Trayco Placer, Inc.; Unnamed Spring; Placer mining and domestic. *Denied June 8, 1942.
10376.... 6– 3–39....Lucille M. Jones (Successor to Rogers Estate); Humboldt River; Irrigation and stockwatering. Approved May 21, 1941. G. S.
10382.... 6–12–39....Lake Shore Gold Mining Company; Lake Mead (Colorado River); Mining, milling, and domestic. Approved July 5, 1940.
10390.... 7– 5–39....Floyd C. Odekirk and Walter Johnson; Underground source through well (Betty Well); Mining and domestic. Canceled September 13, 1940.
10393.... 7– 5–39....Adriatic Mines, Inc.; Tacchino Springs; Mining, milling, and domestic. Denied May 20, 1941.
10394.... 7– 7–39....Alice E. Paddison; Underground source through a mine tunnel; Mining, milling, power, and domestic. *Approved July 16, 1941. G. S.
10398.... 7–17–39....J. N. Bryan; Stookey Spring; Stockwatering. *Approved December 13, 1940. G. S.
10399.... 7–17–39....J. N. Bryan; Overland Spring; Stockwatering. *Approved December 13, 1940. G. S.
10400.... 7–17–39....J. N. Bryan; Underground source through Gabbs Valley Well; Stockwatering. *Approved December 13, 1940. G. S.
10407.... 7–21–39....H. Alex Johnson; Eagle Creek; Mining and domestic. Approved August 6, 1940.
10413.... 8–21–39....Adriatic Mines, Inc.; Upper Tacchino Springs; Mining, milling, and domestic. *Denied May 20, 1941.
10417.... 8–29–39....W. J. Wadhams; Denio Creek, Massacre Middle and West Lakes and Tributaries; Irrigation and domestic. Canceled July 9, 1940.
10418.... 8–30–39....Nevada State Gold Mines Company; Underground Waters (Badger Shaft); Mining, milling, and domestic. *Approved August 8, 1941. G. S.
10419.... 9– 1–39....Wm. Mendelsohn; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Denied December 6, 1940.
10420.... 9– 5–39....June Cheetham; Spring Branch, a tributary of Summit Creek; Mining and domestic. Canceled July 9, 1940.
10421.... 9– 5–39....Nelson, Mullen & Webster, Inc.; Janke Springs; Mining and domestic. *Approved May 23, 1941. G. S.
10424.... 9–15–39....C. G. Sevier; Holy Lake Creek and its Tributaries; Irrigation and domestic. *Approved September 12, 1940. G. S.
10425.... 9–20–39....Henry E. Heidenreich; South Fork of Jumbo Canyon, surface and underground waters; Irrigation and domestic. *Approved February 20, 1941. G. S.
10426.... 9–28–39....Josie Alma Woods; Underground source through a well; Irrigation and domestic. Approved July 30, 1940. G. S.
10427....10– 2–39....Westgate Mining & Milling Corporation; Eastgate Water Channel, commonly known as Eastgate Creek in Buffalo Canyon, Churchill County; Ore milling and domestic. Canceled July 9, 1940.
10428....10–10–39....J. F. Featherstone; Water Creek, east side of Jersey Valley, Lander County; Mining and milling. *Approved July 11, 1941. G. S.
10435....11– 6–39....Geo. W. Hennen; A well or wells located below Warm Springs from an underground source; Mining, milling, and domestic. Approved August 23, 1940. G. S.
10439....11– 9–39....Las Vegas Land and Water Company; Underground source (Las Vegas Artesian Basin or Subterranean Channel); Stockwatering and domestic. Approved July 30, 1940. G. S.

*Protested application. G. S. Good standing.

10441....11–15–39....William C. Browning; Underground and surface water of and under the watershed of Bodie Creek, Mineral County; Mining, milling, and domestic. Canceled July 9, 1940.
10443....11–16–39....Roy A. Judd; Jumbo Creek (unappropriated and flood waters); Irrigation and domestic. Approved February 20, 1941. G. S.
10444....11–21–39....Frank Chlldress and Stuart Welter; Horseshoe Spring; Mining, milling, and domestic. Canceled July 9, 1940.
10447....11–28–39....Nevada United Gold Mining Company; Nevada United Springs; Mining, milling, and domestic. *Approved August 6, 1940. G. S.
10450....12– 4–39....Otto Waddell and Chris Jensen; Cow Springs; Mining and milling (gold dredging); Approved August 6, 1940. G. S.
10451....12– 7–39....John Crosby, Jr.; Unnamed Spring; Mining, milling, and domestic. Approved December 30, 1940. G. S.
10453....12– 8–39....Crater Range Mines, Inc.; Unnamed Spring; Power and domestic. Canceled July 9, 1940.
10454....12– 8–39....Crater Range Mines, Inc.; Unnamed Spring; Mining, milling, and domestic. Canceled July 9, 1940.
10455....12– 8–39....Crater Range Mines, Inc.; Jarbidge River (East Fork); Power. Canceled July 9, 1940.
10456....12– 8–39....Crater Range Mines, Inc.; Pine Creek, Tributary of Jarbidge River; Power and domestic. Canceled July 9, 1940.
10457....12–11–39....L. E. Roberts; Deerlodge Creek; Mining and milling. Approved August 6, 1940. G. S.
10458....12–15–39....Las Vegas Land and Water Company; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Municipal Supply and Domestic. Approved July 30, 1940. G. S.
10459....12–21–39....Thos. Griffin Estate and T. D. Griffin Estate; Humboldt River; Irrigation and domestic. Approved January 30, 1941. G. S.
10460....12–21–39....E. H. Burdick; Underground source through a well; Mining and milling. Approved December 30, 1940. G. S.
10461....12–22–39....Ellen McGuire and H. V. Mathews; Little Red Wash; Irrigation and domestic. Approved August 20, 1940. G. S.
10462.... 1– 2–40....The Technical Operators, Inc.; An underground source through a well; Mining and milling. Denied May 9, 1941.
10463.... 1– 4–40....Lawrence Sharp, E. P. Higbee and Paul Stewart; Sheep Mt. Dry Lake (flood water) and Crescent Valley Dry Channels; Stockwatering and domestic. Approved August 21, 1940. G. S.
10464.... 1–10–40....C. L. Stuart; Spalding Canyon Spring; Mining and domestic. Denied May 9, 1941.
10465.... 1–15–40....Robert B. Saunders; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Denied May 9, 1941.
10467.... 1–29–40....Albert Welch; Carpenter Springs; Stockwatering. *Approved December 4, 1941. G. S.
10470.... 2–21–40....Mildred L. Smith; Hunt's Canyon Creek, Nye County; Stockwatering. Canceled September 13, 1940.
10471.... 2–26–40....E. H. Allen; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved August 20, 1940. G. S
10472.... 3– 1–40....Lois Kellogg II; Underground source (Pahrump Artesian Basin); Irrigation. Approved May 8, 1941. G. S.
10473.... 3– 1–40....Lois Kellogg II; Underground source (Pahrump Artesian Basin); Irrigation. Withdrawn August 23, 1940.
10474.... 3–11–40....Robert E. Bunker; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved August 21, 1940. G. S.
10476.... 3–13–40....Dr. Walter C. McAdoo; McAdoo Spring; Mining and domestic. Approved July 30, 1940. G. S.
10477.... 3–18–40....J. W. Richard; Flow water from Evergreen Channel and Tributaries; Stockwatering and domestic. Approved June 12, 1942. G. S.
10478.... 3–18–40....Buck Horn Cattle Company; Evergreen Channel and Tributaries; Stockwatering and domestic. *Approved June 25, 1942. G. S.
10479.... 3–20–40....Carl F. Muir; Underground source through wells; Irrigation, stockwatering, and domestic. Canceled September 13, 1940.
10480.... 3–20–40....Walter Haggerty; Underground flow; Mining and milling. Approved August 20, 1940. G. S.
10481.... 3–21–40....Frank W. Hinkley; Upper Springs; Mining, milling, and domestic. Approved October 9, 1940. G. S.
10482.... 3–21–40....Frank W. Hinkley; A Cistern (originally filed as the Lower Springs, Application No. 10482—Underground); Mining, milling, and domestic. Approved October 9, 1940. G. S .
10483.... 3–23–40....United States of America, Forest Service; Secret Spring; Stockwatering. Approved August 22, 1940. G. S.
10484.... 3–27–40....R. G. Heckman and O. D. Gable; Rabbit Hole Spring; Mining and domestic. *Approved June 24, 1942. G. S.
10485.... 4– 4–40....Ed. Filippini; Underground source through a well; Stockwatering. Approved July 30, 1940. G. S.

*Protested application. G. S. Good standing.

10486.... 4– 4–40....Copper Canyon Mining Company; Blossom Spring; Mining and milling. *Approved August 2, 1940. G. S.
10489.... 4–10–40....Paul Shoup, Frank Karr and Isidore B. Dockweiler, as joint tenants with right of survivorship; Underground source through artesian well No. 6; Irrigation. Approved January 28, 1941. G. S.
10490.... 4–10–40....Paul Shoup, Frank Karr and Isidore B. Dockweiler, as joint tenants with right of survivorship; Bennett's Springs Nos. 1 and 2; Irrigation. Approved January 28, 1941. G. S.
10491.... 4–10–40....Paul Shoup, Frank Karr and Isidore B. Dockweiler, as joint tenants with right of survivorship; Underground source through Artesian Well No. 5; Irrigation. Approved January 28, 1941. G. S.
10492.... 4–10–40....Paul Shoup, Frank Karr and Isidore B. Dockweiler, as joint tenants with right of survivorship; Underground source through Artesian Well No. 4; Irrigation. Approved January 28, 1941. G. S.
10493.... 4–10–40....Victor Lambertucci; Underground source through a well; Irrigation and domestic. Approved January 17, 1941. G. S.
10494.... 4–17–40....E. E. Evans; Underground flow of Unnamed Canyon and Wash; Placer mining and domestic. Canceled September 13, 1940.
10495.... 4–18–40....Ray W. West and Grace M. West; West Springs; Mining and domestic. Approved December 30, 1940. G. S.
10496.... 4–25–40....Currant Creek Mining Company; Twin Springs, Nye County; Mining, milling, and domestic. *Withdrawn September 11, 1940.
10497.... 4–29–40....91 Club (Incorporated); Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved August 5, 1940.
10498.... 5– 1–40....Chas. F. Lee; Wilson Creek; Irrigation and domestic. *Approved November 21, 1941. G. S.
10500.... 5– 8–40....W. W. Hartman; Surface and sub-surface water from an unnamed wash; Mining, milling, and domestic. Approved November 4, 1940. G. S.
10501.... 5– 9–40....Victor Lambertucci; Underground water through a well; Irrigation and domestic. Approved January 17, 1941. G. S.
10502.... 5– 9–40....Victor Lambertucci; Underground Bottle Gulch Underflow; Irrigation and domestic. Approved January 17, 1941. G. S.
10503.... 5–13–40....E. A. Clark; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved December 3, 1941. G. S.
10504.... 5–15–40....St. Elmo Mining Company, Inc.; North Fork Cornwall Creek; Mining, milling, and domestic. Canceled December 28, 1940.
10505.... 5–17–40....Richard L. Wood; Wood Springs; Stockwatering. Approved September 10, 1940. G. S.
10506.... 5–17–40....P. M. Anderson; Buckskin Springs; Mining and domestic. Approved April 8, 1941.
10508.... 5–20–40....Las Vegas Land & Water Company; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Municipal supply and domestic. Approved March 28, 1941. G. S.
10509.... 5–20–40....John Dunsmore, E. S. Gillette and George W. Dunsmore; Underground source through Whitney Well (a driven well); Mining, milling, and domestic. Approved March 20, 1941. G. S.
10510.... 5–20–40....Frank Walker and David Francis; Bradshaw Spring; Stockwatering. Approved November 25, 1940. G. S.
10511.... 5–25–40....Don Maestretti; Ox Corral Creek; Placer mining and domestic. Canceled December 28, 1940.
10512.... 6– 5–40....B & M Mining Company; Underground source through Liberty Well; Mining placer gravel. Approved April 2, 1941. G. S.
10513.... 6– 5–40....Cathrine E. Woods; Katy Seep; Irrigation and domestic. Withdrawn August 9, 1940.
10514.... 6– 5–40....Lois Kellogg II; Underground source (Pahrump Artesian Basin); Irrigation. Canceled December 28, 1940.
10515.... 6– 7–40....C. H. Jackson, Jr.; Unnamed Spring; Irrigation and domestic. Approved April 3, 1941. G. S.
10516.... 6– 7–40....Frank W. Hinkley; Middle Springs; Mining, milling, and domestic. Approved Oetober 9, 1940. G. S.
10517.... 6– 8–40....O. D. Iveson; Nigger Creek (flood waters); Irrigation and domestic. Approved April 15, 1941. G. S.
10518.... 6–11–40....Mary E. Tobin; Crystal Springs; Mining and milling. Approved April 8, 1941. G. S.
10519.... 6–14–40....Mr. and Mrs. G. W. Bettles; A spring a mile and a half west of highway; Domestic and auto camp site. Canceled December 28, 1940.
10520.... 6–19–40....Nevada Hotel Company; Underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic. Approved September 30, 1940. G. S.
10524.... 6–21–40....Walter Haggerty; An underground flow in Northumberland Canyon; Mining and milling. Approved February 20, 1941. G. S.
10525.... 6–27–40....N. E. Hanson; Underground water through a well; Mining, milling, and domestic. Approved March 6, 1941. G. S.
10526.... 6–29–40....C. A. Liddell; Indian Springs; Mining, milling, and domestic. Approved January 9, 1942. G. S.

*Protested application. G. S. Good standing.

CHAPTER XX

Certificates Issued Under Permits, 1940–1942

Following is a condensed statement giving the salient data in connection with Certificates Issued Under Permits during the biennium for the period July 1, 1940, to June 30, 1942, in the order of:

1. Certificate number.
2. Book number.
3. Permit number.
4. Name of appropriator.
5. Source of water supply.
6. Purpose of appropriation.
7. Amount of water in cubic feet per second, unless otherwise noted.
8. Date of certificate issued.

2537	8	10293	T. J. Thebo; Underground Water (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic	0.045	7–30–40
2538	8	9652	E. A. Clark; Underground Source (Las Vegas Valley Artesian Basin or Subterranean Channel); Municipal and domestic	0.40	8–13–40
2539	8	10035	Alfred W. and Isabelle Blackman; Underground Source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic	0.05	8–16–40
2540	8	7887	W. T. Jenkins Company; Tunnel Spring; Stockwatering and domestic	0.0223	8–22–40
2541	8	6977	W. T. Jenkins Company; A Spring (Unnamed); Irrigation	0.992	8–23–40
2542	8	9307	Joe Ulrich; Underground Source; General domestic	0.025	10–24–40
2543	8	9268	H. Heidenreich; Underground Source (Wells Nos. 1, 2, and 3); Irrigation and domestic	0.9402	11–21–40
2544	8	10010	Earl Otteraaen; Kennedy Creek; Mining, milling, and domestic	0.125	12– 2–40
2545	8	9250	W. D. and M. E. Caton; Duffy Trough Springs; Stockwatering	0.006	12– 7–40
2546	8	9251	W. D. and M. E. Caton; Joe Jeal Spring; Stockwatering	0.006	12– 7–40
2547	8	9252	W. D. and M. E. Caton; Willow Creek Spring; Stockwatering	0.006	12– 7–40
2548	8	9912	California Lands, Inc.; Underground Water (Long Canyon Well); Stockwatering	0.0281	12– 7–40
2549	8	9879	Jos. Flynn; Underground Source (Bald Mountain Well); Stockwatering	0.013	12– 9–40
2550	8	9880	Jos. Flynn; Underground Source (Rye Patch Well); Stockwatering	0.013	12– 9–40
2551	8	10430	W. W. Hartman; Unnamed Wash; Mining and domestic	0.10	12–10–40
2552	8	8300	Handley Brothers; White Hill Spring; Stockwatering	0.016	12–11–40
2553	8	8805	Heidenreich Brothers, a copartnership consisting of Edwin E., Roy F. and Henry E. Heidenreich; Underground Source; Irrigation and domestic	1.858	12–11–40
2554	8	9641	Wayne H. Smith, an undivided one-half interest, and Elizabeth H. Smith, an undivided one-half interest; Underground Source (New Pass Well); Mining, milling, and domestic	0.025	12–12–40
2555	8	9984	Wayne H. Smith; Underground Source; Mining, milling, and domestic	0.025	12–12–40
2556	8	3362	Mildred L. Smith; Barley Creek and Tributaries; Irrigation	2.651	12–13–40
2557	8	7529	W. W. Whitaker; Rock Spring; Stockwatering	0.05	12–30–40
2558	8	7531	W. W. Whitaker; Cold Spring; Stockwatering	0.05	12–30–40
2559	8	7532	W. W. Whitaker; Butterfield Spring; Stockwatering	0.025	12–30–40
2560	8	9320	George Whittell; Zephyr Cove Creek (North Fork); Domestic, camp and fire protection	0.05	12–30–40

*Protested application. G. S. Good standing.

2561	8	10429	Summit King Mines, Ltd.; Underground Source; Mining, milling, and domestic	0.075	12-30-40
2562	8	3936	I. J. Richard; Richard Spring; Irrigation and domestic	0.04	1- 2-41
2563	8	10204	The Ellison Ranching Company; Jerret Creek; Irrigation	1.603	1- 2-41
2564	8	10205	The Ellison Ranching Company; Hot Creek; Irrigation	0.347	1- 2-41
2565	8	10206	The Ellison Ranching Company; South Fork Owyhee River (Spring Creek); Irrigation	1.02	1- 2-41
2566	8	9428	Rubert R. Spencer; Horse Creek; Irrigation and domestic	1.084	1- 2-41
2567	8	10483	United States of America, Forest Service; Secret Spring; Stockwatering	0.005	1- 2-41
2568	8	7118	Dan Esparza; Hillyer Creek; Irrigation and domestic	0.1623	1- 7-41
2569	8	9614	City of Las Vegas; Underground Source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation	0.10	1- 9-41
2570	8	9996	Charles Labbe; Willow Spring; Mining and milling	0.037	1-17-41
2571	8	6947	James Daniels and Archie Daniels; Indian Spring; Irrigation	0.025	1-17-41
2572	8	9563	William F. and Rhoda Stephens; Snow Creek (East Fork); Irrigation and domestic; 150 acre-feet per season		1-28-41
2573	8	3785	United States Department of Agriculture, Forest Service; A group of unnamed springs; Irrigation and domestic	0.25	2- 5-41
2574	8	9997	Henry Quill; Unnamed Spring; General domestic, including irrigation of lawn, garden and fire protection	0.0223	2-10-41
2575	8	10530	Department of Highways, State of Nevada; Willow Springs; General domestic and use of traveling public	0.03	3- 6-41
2576	8	10542	West Coast Mines, Inc.; An underground source; Mining, milling, and domestic	0.78	3- 6-41
2577	8	7973	Thomas Ormachea; Smooth Canyon Spring; Stockwatering	0.019	3- 6-41
2578	8	9386	Moore Sheep Company; Underground Water (Moore Well No. 2); Stockwatering	0.0313	3- 6-41
2579	8	9369	Moore Sheep Company; Underground Water (Moore Well No. 1); Stockwatering	0.0313	3- 6-41
2580	8	10434	Julia Russell; Underground Source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic	0.267	3- 6-41
2581	8	9978	Karoline Berrum; An underground source; Bathing, heating and general domestic	0.056	3-11-41
*2582	8	9820	Mrs. Alvira Walch; Clay Spring; Domestic	0.025	11-25-41
*2583	8	9843	Mrs. Alvira Walch; Pine Creek; Irrigation and domestic	0.1783	11-25-41
2584	8	3953	Petan Land and Cattle Company; Wall Creek; Irrigation	5.016	3-25-41
2585	8	9525	Julia Russell; Underground Source (Las Vegas Artesian Basin or Subterranean Channel); Irrigation and domestic	0.72	3-25-41
2586	8	8407	John Auzquy and Company, a copartnership consisting of John Auzquy and Eugenio Orueta; Poor Cow Spring; Stockwatering	0.0016	4- 2-41
2587	8	8408	John Auzquy and Company, a copartnership consisting of John Auzquy and Eugenio Orueta; Gouge Eye Spring; Stockwatering	0.0016	4- 2-41
2588	8	8175	John Auzquy and Company, a copartnership consisting of John Auzquy and Eugenio Orueta; Pony Spring; Stockwatering and domestic	0.0063	4- 2-41
2589	8	8176	John Auzquy and Company, a copartnership consisting of John Auzquy and Eugenio Orueta; Dutch John Well (underground source); Stockwatering and domestic	0.025	4- 2-41
2590	8	9791	Bank of Pioche, Inc.; Big Spring; Irrigation and domestic	0.4059	4- 2-41
2591	8	10038	E. T. Heggland; Larkin Spring; Mining and domestic	0.00223	4- 2-41
2592	8	9239	Van O. Eastland; Underground Source (Las Vegas Valley Artesian Basin or Subterranean Channel); Domestic	0.033	4-10-41
2593	8	9914	Elmer U. and Erma T. Baxter; An underground source (Las Vegas Valley Artesian Basin or Subterranean Channel); Irrigation and domestic	0.0025	4-15-41
2594	8	9244	Arthur A. Schacht; Underground source; Irrigation	1.8990	4-24-41

*Amended Certificate.

2595	8	10551	John H. Conaway; Sevenokes Seep; Stockwatering	0.00313	7–10–41
2596	8	10629	John H. Conaway; Mona Spring; Stockwatering	0.006	7–23–41
2597	8	9234	C. H. Baker and Dan Pavich; An Unnamed Spring; Mining and domestic	0.125	8– 6–41
2598	8	10604	R. M. Miller; Cool Spring; Stockwatering	0.006	8– 6–41
2599	8	10071	Mill Gulch Placer Mining Company; An Underground Source; Mining and domestic	0.67	8–11–41
2600	8	9900	Desert Silver, Inc.; Cottonwood Creek and Spring; Mining, milling, and domestic	0.12	9–30–41
2601	8	9658	T. O. McKinnon and B. F. Baker; South Mitchell Spring; Irrigation and domestic	0.104	9–30–41
2602	8	10214	Billie Lamb; Badger Spring; Stockwatering	0.004	9–30–41
2603	8	10219	United States Forest Service; Easter Spring; Domestic	0.011	10–20–41
2604	8	9462	Smith Petersen & Company; Underground Source; Industrial	1.38	10–29–41
2605	8	9902	E. M. Dawes; Underground Source; Milling and domestic	0.10	10–29–41
2606	8	3361	Mildred Smith; Barley Creek and its Tributaries, Meadow Creek and Widow Smith Creek; Irrigation and domestic	1.205	11– 3–41
2607	8	10510	Frank Walker and David Francis; Bradshaw Spring; Stockwatering	0.019	11–10–41
2608	8	9801	J. W. Solen; Clear Creek Springs and Creek, North Fork; Stockwatering	0.032	11–19–41
2609	8	9802	J. W. Solen; Clear Creek Springs and Creek, East Fork; Stockwatering	0.032	11–19–41
2610	8	9803	J. W. Solen; Clear Creek Springs and Creek, South Fork; Stockwatering	0.032	11–19–41
2611	8	10655	John H. Conaway; Buckboard Spring; Stockwatering	0.007	11–20–41
2612	8	10656	John H. Conaway; Willow Spring; Stockwatering	0.008	11–20–41
2613	8	8519	W. F. and Letha M. Cockrell; Cherry Creek and Springs; Stockwatering	0.002	12– 2–41
2614	8	8521	W. F. and Letha M. Cockrell; Wild Horse Spring; Stockwatering	0.001	12– 2–41
2615	8	10627	John H. Conaway and D. L. Stewart; Pony Spring Dry Channel; Stockwatering	0.01	12– 2–41
2616	8	3014	Edd Helth; Lamoille Creek; Irrigation and domestic	0.9982	12– 4–41
2617	8	10024	John Bergmann; Engle Spring; Mining and domestic	0.01	12– 5–41
2618	8	8467	Lloyd T. Springmeyer; Chipmonk Springs; Stockwatering and domestic	0.0125	12–30–41
2619	8	9587	United States of America; Martinez Spring; Stockwatering (watering of antelope, deer, and other wild life)	0.055	12–30–41
2620	8	3253	Frank Allen; Shale Cut Spring; Stockwatering and domestic	0.003	1–12–42
2621	8	3254	Frank Allen; White Rock Spring; Stockwatering and domestic	0.003	1–12–42
2622	8	10088	Karl C. Stewart; Eight Mile Spring; Stockwatering	0.003	1–13–42
2623	8	3920	Henry Filippini; Reese River; Irrigation	0.9607	1–14–42
2624	8	9986	Mesquite and Bunkerville Community Center Organizations; Mica Notch Spring; General domestic	0.27851	1–14–42
2625	8	10161	Clark C. Johnson; Johnson Spring; Irrigation and domestic	0.3162	1–15–42
2626	8	8701	George Eldridge; Underground Source; Stockwatering	0.0125	1–21–42
2627	8	10036	Black Mammoth Consolidated Mining Company; Silver Peak Spring; Mining, milling, and domestic	0.334	1–21–42
2628	8	5809	Mildred Smith; Combination Springs; Stockwatering	0.003	1–21–42
2629	8	9740	The Town of Carlin; Underground Source; Municipal	0.56	1–26–42
2630	8	9799	The Town of Carlin; Underground Source; Municipal	0.89	1–26–42
2631	8	9431	R. E. Hartsif; Pidgeon Springs; Irrigation and domestic	0.047	1–27–42
2632	8	8397	Fritz Walti; Walti Springs Nos. 16, 17, 18, and 19; Irrigation	0.437	1–28–42
2633	8	10654	John H. Conaway; Delamar Valley Drainage (Delamar Lower Dry Lake Reservoir); Stockwatering	5.0	2–24–42
2634	8	5916	Joe F. Perkins; Wire Grass Spring; Stockwatering and domestic	0.003	3–10–42
2635	8	10183	City of Las Vegas, Nevada; Underground Source (Las Vegas Valley Artesian Basin); Washing sand and gravel	0.28	4–13–42

*Protested application. G. S. Good standing.

2636	8	7339	Jean A. Prentiss (formerly Jean A. Simonich); Tony Creek; Irrigation and domestic	0.3261	4-24-42
2637	8	10659	James Ryan and John H. Conaway; Flood Waters of Delamar Flat Hardpan; Stockwatering	10 acre feet	4-28-42
2638	8	7636	James H. Day; Underground source through four artesian wells; Irrigation and domestic	0.7836	5- 1-42
2639	8	7899	James H. Day; Underground source through an artesian well; Irrigation and domestic	0.0386	5- 1-42
2640	8	9771	N. H. Getchell; An Unnamed Spring; Milling and domestic	0.0445	5- 2-42
2641	8	10645	C. L. Averett; An underground source; Domestic	0.0089	5- 6-42
2642	8	10652	C. L. Averett; Averett Spring; Stockwatering and domestic	0.0089	5- 6-42
2643	8	10653	C. L. Averett; Hidden Springs; Stockwatering and domestic	0.0089	5- 6-42
2644	8	5299	Fred C. Hummel and Pearl S. Hummel; Dunnisher Springs; Stockwatering	0.0031	5- 8-42

*Protested application. G. S. Good standing.

FINANCIAL STATISTICS

CHAPTER XXII

Office Finances

Statement showing receipts and disbursements of State Engineer's office accounts, and statements of disbursements of other accounts controlled by this office for the period July 1, 1940, to June 30, 1942.

STATEMENT OF EXPENDITURES FROM APPROPRIATION FOR SUPPORT OF STATE ENGINEER'S OFFICE FOR THE PERIOD JULY 1, 1940, TO JUNE 30, 1942

Month and Year	Appropriation by Legislature	Salaries	Travel expense	Office expense	Equipment	Total	Balance
Balance July 1, 1940	.....	.....	.....	.....	.....	.....	$14,559.14
1940							
July	.....	$675.00	$197.89	$122.63	$97.19	$1,092.71	
August	.....	675.00	67.12	23.50	.....	765.62	
September	.....	675.00	222.54	145.35	.....	1,042.89	
October	.....	675.00	323.53	63.81	.....	1,062.34	
November	.....	1,025.00	137.87	158.09	.....	1,320.96	
December	.....	850.00	251.60	166.36	.....	1,267.96	
Totals	.....	$4,575.00	$1,200.55	$679.74	$97.19	$6,552.48	6,552.48
Balance January 1, 1941	.....	.....	.....	.....	.....	.....	$8,006.66
1941							
January	.....	$850.00	$89.93	$133.55	$578.31	$1,651.79	
February	.....	850.00	326.71	77.68	.....	1,254.39	
March	.....	675.00	44.69	146.60	.....	866.29	
April	.....	675.00	115.63	150.88	480.25	1,421.76	
May	.....	675.00	145.47	158.83	.....	979.30	
June	.....	675.00	254.72	758.03	133.85	1,821.60	
Totals	.....	$4,400.00	$977.15	$1,425.57	$1,192.41	$7,995.13	7,995.13
Reverted June 30, 1941	.....	.....	.....	.....	.....	.....	$11.53
July	*$24,550.00	$675.00	$8.06	$63.90	$734.00	$1,480.96	$24,550.00
August	.....	675.00	138.86	68.54	.....	882.40	
September	.....	675.00	214.54	10.95	.....	900.49	
October	.....	675.00	208.08	136.05	.....	1,019.13	
November	.....	675.00	229.38	120.92	.....	1,025.30	
December	.....	675.00	293.70	173.67	.....	1,142.37	
Totals	.....	$4,050.00	$1,092.62	$574.03	$734.00	$6,450.65	6,450.65
Balance January 1, 1942	.....	.....	.....	.....	.....	.....	$18,099.35
1942							
January	.....	$605.00	$56.64	$71.30	.....	$732.94	
February	.....	737.92	213.51	113.22	.....	1,064.65	
March	.....	450.00	108.13	155.53	.....	713.66	

April	.....	700.00	67.45	108.42	.....	875.87	
May	.....	700.00	101.54	73.41	.....	874.95	
June	.....	700.00	213.99	90.30	.....	1,004.29	
Totals	.....	$3,892.92	$761.26	$612.18	.....	$5,266.36	5,266.36
Balance July 1, 1942	.....	.....	.....	.....	.....	.....	$12,832.99

*Appropriation for support of State Engineer's Office not including statutory salary appropriation.

STATEMENT OF FEES COLLECTED BY STATE ENGINEER FROM JULY 1, 1940, TO JUNE 30, 1942

Month and years	Total fees received	Proofs of appropriation	Applications: Publications	Applications: Fees	Recording permits	Proofs of commencement	Proofs of completion	Proof of beneficial use	Protests	Clerical	Blue prints	Excess collections	Advance for certificates
1940													
July	$533.00	.....	$212.50	$127.50	$140.00	$3.00	$3.00	$5.00	$4.00	$25.00	$12.00	.....	$1.00
August	452.00	.....	112.50	67.50	200.00	16.00	1.00	4.00	3.00	24.00	1.00	$19.00	4.00
September	331.00	$20.00	137.50	82.50	55.00	6.00	3.00	4.00	4.00	18.00	1.00		
October	206.00	.....	100.00	60.00	.....	5.00	1.00	2.00	3.00	28.00	6.00	.....	1.00
November	739.00	.....	375.00	225.00	40.00	3.00	4.00	3.00	.....	25.00	8.00	55.00	1.00
December	381.00	20.00	75.00	45.00	140.00	7.00	6.00	1.00	8.00	36.00	12.00	8.00	23.00
Totals	$2,642.00	$40.00	$1,012.50	$607.50	$575.00	$40.00	$18.00	$19.00	$22.00	$156.00	$40.00	$82.00	$30.00
1941													
January	$340.00	.....	$125.00	$80.00	$87.00	$4.00	$7.00	$2.00	$1.00	$18.00	$7.00	.....	$9.00
February	487.00	.....	175.00	105.00	120.00	13.00	10.00	13.00	.....	29.00	8.00	$13.00	1.00
March	674.50	.....	137.50	82.50	377.50	15.00	3.00	3.00	1.00	21.00	5.00	14.00	15.00
April	563.00	.....	175.00	110.00	210.00	9.00	7.00	3.00	2.00	33.00	10.00	.....	4.00
May	616.50	.....	225.00	135.00	190.00	3.00	2.00	5.00	2.00	31.50	18.00	5.00	
June	476.50	$20.00	162.50	107.50	120.00	4.00	4.00	3.00	3.00	35.50	17.00		
July	514.00	.....	225.00	145.00	100.00	7.00	7.00	7.00	4.00	8.00	9.00	1.00	1.00
August	424.00	10.00	187.50	112.50	50.00	11.00	3.00	3.00	9.00	31.00	3.00	.....	4.00
September	387.00	10.00	200.00	125.00	.....	12.00	5.00	.....	5.00	18.00	8.00	.....	4.00
October	748.53	.....	225.00	135.00	337.88	5.00	4.00	9.00	5.00	14.00	7.65	3.00	3.00
November	341.00	.....	87.50	52.50	110.00	29.00	6.00	5.00	3.00	28.00	7.00	3.00	10.00
December	689.00	.....	87.50	57.50	455.00	21.00	3.00	14.00	4.00	35.00	1.00	8.00	3.00
Totals	$6,261.03	$40.00	$2,012.50	$1,247.50	$2,157.38	$133.00	$61.00	$67.00	$39.00	$302.00	$100.65	$47.00	$54.00
1942													
January	$442.00	.....	$175.00	$110.00	$90.00	$5.00	$6.00	$5.00	$8.00	$26.00	$2.00	$1.00	$14.00
February	221.00	.....	100.00	60.00	20.00	3.00	4.00	16.00	.....	14.00	4.00		
March	413.00	.....	150.00	90.00	80.00	3.00	6.00	3.00	4.00	8.00	8.00	59.00	2.00
April	723.00	.....	262.50	157.50	210.50	6.00	13.00	6.00	.....	43.00	5.00	16.50	3.00
May	480.65	.....	125.00	85.00	201.65	7.00	2.00	.....	1.00	36.00	2.00	15.00	6.00
June	463.00	.....	162.50	97.50	163.00	10.00	2.00	2.00	.....	17.00	9.00		
Totals	$2,742.65	.....	$975.00	$600.00	$765.15	$34.00	$33.00	$32.00	$13.00	$144.00	$30.00	$91.50	$25.00

STATEMENT OF DISBURSEMENTS FROM STATE ENGINEER'S FUND FOR THE PERIOD JULY 1, 1940, to JUNE 30, 1942

Month and year	Total disbursements	Deposited with State Treasurer	Paid for publications	Refunds	Recording certificates	Blue prints
1940						
July	$439.50	$276.00	$50.00	$112.50	$1.00	
August	464.00	316.00	112.50	31.50	4.00	
September	410.50	173.00	187.50	50.00		
October	5,343.48	5,329.98	.....	12.50	1.00	
November	485.00	304.00	112.50	67.50	1.00	
December	462.50	249.00	137.50	58.00	18.00	
Totals	$7,604.98	$6,647.98	$600.00	$332.00	$25.00	
1941						
January	$665.52	$202.50	$437.50	.....	$11.00	$14.52
February	496.50	294.00	187.50	$13.00	2.00	
March	544.09	505.50	.....	14.00	11.00	13.59
April	538.00	379.00	137.50	12.50	9.00	
May	532.50	377.50	150.00	5.00		
June	437.50	285.50	112.50	39.50		
July	373.00	282.50	75.00	13.50	2.00	
August	449.00	221.00	225.00	.....	3.00	
September	431.50	169.00	250.00	12.50		
October	835.21	513.71	225.00	90.50	6.00	
November	335.50	237.00	87.50	3.00	8.00	
December	967.50	590.00	350.00	20.50	7.00	
Totals	$6,605.82	$4,057.21	$2,237.50	$224.00	$59.00	$28.11
1942						
January	$327.50	$251.00	.....	$63.50	$13.00	
February	282.50	119.00	$162.50	.....	1.00	
March	418.50	198.00	187.50	9.00	1.00	$23.00
April	520.50	438.50	12.50	66.50	3.00	
May	345.65	333.65	.....	5.00	7.00	
June	446.00	296.00	75.00	75.00		
Totals	$2,340.65	$1,636.15	$437.50	$219.00	$25.00	$23.00

STATEMENT OF RECEIPTS AND DISBURSEMENTS, JULY 1, 1940, TO JUNE 30, 1942

Balance July 1, 1940	$10,112.76
Receipts July 1, 1940, to June 30, 1942	11,660.68
	$21,773.44
Disbursements July 1, 1940, to June 30, 1942	$16,551.45
Balance July 1, 1942	5,221.99
	$21,773.44

CASH RECONCILEMENT

Balance Carson Branch, First National Bank of Nevada, June 30, 1942	$4,415.49	
Less outstanding checks	443.50	
	$3,971.99	$3,971.99
Revolving fund		1,250.00
Balance July 1, 1942		$5,221.99

HUMBOLDT RIVER DISTRIBUTION, STATEMENT OF EXPENSES FROM JULY 1, 1940, TO JUNE 30, 1942

Month and year	Salaries	Travel expense	Miscellaneous expense	Total
1940				
July	$1,609.65	$403.00	$52.30	$2,064.95
August	1,054.00	192.25	40.12	1,286.37
September	816.10	99.27	171.56	1,086.93
October	785.05	276.09	26.83	1,087.97
November	563.05	484.68	23.70	1,071.43
December	615.04	139.92	25.08	780.04
Totals	$5,442.89	$1,595.21	$339.59	$7,377.69
1941				
January	$315.05	$39.76	$7.09	$361.90
February	285.00	8.76	6.41	300.17
March	1,131.25	29.35	23.65	1,184.25
April	150.50	61.16	.....	211.66
May	1,505.20	355.53	3,062.38*	4,923.11
June	1,855.41	.....	41.74	1,897.15
July	1,800.00	754.03	116.83	2,670.86
August	1,209.81	369.86	37.48	1,617.15
September	956.31	403.23	31.60	1,391.14
October	570.05	.....	12.26	582.31
November	629.75	332.26	17.52	979.53
December	640.00	207.65	17.44	865.09
Totals	$11,048.33	$2,561.59	$3,374.40	$16,984.32
1942				
January	$335.00	$22.18	$58.33	$415.51
February	330.00	49.64	6.75	386.39
March	335.00	2.74	17.75	355.49
April	1,083.30	132.97	25.57	1,241.84
May	1,200.50	54.81	26.76	1,282.07
June	1,618.50	330.11	131.36	2,079.97
Totals	$4,902.30	$592.45	$266.52	$5,761.27

*Of this amount only $138.16 was an expenditure. $2,924.22 was a transfer made to correct an error which placed reimbursement of court costs in the Humboldt River Distribution Fund.

LITTLE HUMBOLDT RIVER DISTRIBUTION, STATEMENT OF EXPENSES FROM JULY 1, 1940, TO JUNE 30, 1942

Month and year	Salaries	Travel expense	Miscellaneous expense	Total
1940				
July	$240.00	$102.65	$5.40	$348.05
August	248.00	101.58	15.68	365.26
September	125.00	.....	32.81	157.81
October	5.00	.....	.....	5.00
November	5.00	.....	.....	5.00
Totals	$623.00	$204.23	$53.89	$881.12

LITTLE HUMBOLDT RIVER DISTRIBUTION EXPENSES—*Continued.*

1941				
January	$5.00	.....	.....	$5.00
February	5.00	.....	.....	5.00
March	181.00	$44.64	$3.96	229.60
April	248.00	84.20	5.58	337.78
May	240.00	39.91	5.40	285.31
June	248.00	57.50	5.58	311.08
July	240.00	70.82	5.40	316.22
August	248.00	90.51	5.58	344.09
September	248.00	30.10	5.58	283.68
October	120.00	53.97	2.70	176.67
November	88.00	22.40	1.98	112.38
Totals	$1,871.00	$494.05	$41.76	$2,406.81
1942				
January	$7.50	.....	$1.10	$8.60
February	5.00	.....	.....	5.00
March	301.00	$104.16	6.89	412.05
April	248.00	137.73	5.58	391.31
May	240.00	136.85	5.40	382.25
June	248.00	114.10	5.58	367.68
Totals	$1,049.50	$492.84	$24.55	$1,566.89

CURRANT AND DUCKWATER DISTRIBUTION, STATEMENT OF EXPENSES FROM JULY 1, 1940, TO JUNE 30, 1942

Month and year	Salaries	Miscellaneous expense	Total
1940			
July	$165.00	$5.31	$170.31
August	180.00	4.05	184.05
September	168.00	21.83	189.83
October	120.00	2.70	122.70
Totals	$633.00	$33.89	$666.89
1941			
June	$132.00	$2.97	$134.97
July	180.00	6.16	186.16
August	186.00	4.18	190.18
September	144.00	3.24	147.24
Totals	$642.00	$16.55	$658.55
1942			
May	$19.50	$41.16	$60.66
June	149.50	3.36	152.86
Totals	$169.00	$44.52	$213.52

PAHRANAGAT LAKE DISTRIBUTION, STATEMENT OF EXPENSES FROM JULY 1, 1940, TO JUNE 30, 1942

Month and year	Salaries	Travel expense	Miscellaneous expense	Total
1940				
July	$119.00	$28.33	$9.68	$157.01
August	217.00	24.74	4.88	246.62
September	238.00	63.26	27.77	329.03
Totals	$574.00	$116.33	$42.33	$732.66
1941				
August	$154.00	$30.57	$3.47	$188.04
September	112.00	35.43	2.52	149.95
October	105.00	.....	2.56	107.56
Totals	$371.00	$66.00	$8.55	$445.55
1942				
June	$70.00	$12.95	$1.58	$84.53

MUDDY RIVER DISTRIBUTION, STATEMENT OF EXPENSES FROM JULY 1, 1940, TO JUNE 30, 1942

Month and year	Salaries	Miscellaneous expense	Total
1940			
July	$129.00	$2.90	$131.90
August	46.50	1.05	47.55
September	46.50	16.05	62.55
October	45.00	1.01	46.01
November	15.50	.....	15.50
December	15.00	.....	15.00
Totals	$297.50	$21.01	$318.51
1941			
January	$15.50	.....	$15.50
February	15.50	.....	15.50
March	14.00	.....	14.00
April	15.50	.....	15.50
May	15.00	.....	15.00
June	46.50	$1.05	47.55
July	45.00	1.01	46.01
August	46.50	1.05	47.55
September	46.50	1.05	47.55
October	45.00	1.01	46.01
November	15.50	.....	15.50
December	15.00	.....	15.00
Totals	$335.50	$5.17	$340.67
1942			
January	$15.50	.....	$15.50
February	15.50	.....	15.50
March	14.00	.....	14.00
April	15.50	.....	15.50
May	15.00	.....	15.00
June	46.50	$1.05	47.55
Totals	$122.00	$1.05	$123.05

WHITE RIVER DISTRIBUTION, STATEMENT OF EXPENDITURES FROM JULY 1, 1940, TO JUNE 30, 1942

Month and year	Salaries	Miscellaneous expense	Total
1940			
July	$60.00	$1.35	$61.35
August	60.00	1.35	61.35
September	60.00	1.35	61.35
October	20.00	.....	20.00
Totals	$200.00	$4.05	$204.05
1941			
September	$93.00	$2.09	$95.09

NEVADA COOPERATIVE SNOW SURVEY, STATEMENT OF DISBURSEMENTS FROM JULY 1, 1940, TO JUNE 30, 1942

Month and year	Appropriation by Legislature	Wages	Miscellaneous expenses	Total	Balance
Balance July 1, 1940	.....	.....	.....	.....	$509.07
1941					
March	.....	$142.50	.....	$142.50	
April	.....	365.00	.....	365.00	
Totals	.....	$507.50	.....	$507.50	*$1.57
	*Reverted to General Fund.				
July 1, 1941	$1,000.00				
1942					
February	.....	$180.70	$31.09	$211.79	
March	.....	80.00	.....	80.00	
April	.....	210.00	.....	210.00	
Totals	.....	$470.70	$31.09	$501.79	$498.21

NEVADA COOPERATIVE STREAM MEASUREMENT, STATEMENT OF EXPENSES FROM JULY 1, 1940, TO JUNE 30, 1942

Month and year	Appropriation by Legislature	Wages	Miscellaneous expenses	Total	Balance
Balance July 1, 1940					$1,098.50
1940					
August		$206.35	$26.35	$232.70	
December		150.25	26.38	176.63	
Totals		$356.60	$52.73	$409.33	$689.17
Reimbursement					104.30
					$793.47
1941					
March		$272.47	$40.78	$313.25	
May		205.00	132.55	337.55	
June		142.67		142.67	
Totals		$620.14	$173.33	$793.47	
July 1, 1941	$1,500.00				
November		$92.00		$92.00	
December		62.63		62.63	
Totals		$154.63		$154.63	$1,345.37
1942					
January		$121.30		$121.30	
March		20.00		20.00	
Totals		$141.30		$141.30	$1,204.07

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