ASSESSMENT OF THE SALT RIVER'S NAVIGABILITY PRIOR TO AND ON THE DATE OF ARIZONA'S STATEHOOD, FEBRUARY 14, 1912

by

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Salt River
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ORIGINAL

RECEIVED 12-9-96

Ms. Christina Waddell
Executive Director
Arizona Navigable Stream Adjudication Commission
1700 West Washington, Room 404
Phoenix, Arizona 85007

Re: Submission of Dr. Douglas Littlefield's Report re Navigability of Salt River from Granite Reef Dam to Gila River Confluence

Dear Christina:

Enclosed are six copies of a report entitled "Assessment of the Salt River's Navigability Prior to and on the Date of Arizona's Statehood, February 14, 1912." This report was prepared by Dr. Douglas Littlefield, an expert retained by the Salt River Project, for purposes of the Commission hearings on this reach of the Salt River.

Dr. Littlefield will be available to present the results of his research and answer questions at the Commission hearing scheduled for December 17. It is our understanding that the hearing may take more than one day and, therefore, may be continued on a subsequent day. Because Dr. Littlefield is traveling from California for the hearing, we would appreciate it if he can be scheduled to provide his testimony on December 17. If necessary, Dr. Littlefield will return for any subsequent hearing day(s).

If you have any questions regarding this submission or need additional information, please do not hesitate to call me.

Very truly yours,

Salmon, Lewis & Weldon, P.L.C.

By Mark A. McGinnis

Mark A. McGinnis

Encls
cc: Frederic L. Beeson, Esq. (w/o encls)
Dr. Douglas Littlefield (w/o encls)
John B. Weldon, Jr., Esq. (w/o encls)

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TABLE OF CONTENTS

LIST OF MAPS AND ILLUSTRATIONS

EXECUTIVE SUMMARY

The purpose of this report is to assess the navigability of the Salt River between its confluence with the Gila River and Granite Reef Dam on or before February 14, 1912 -- the date Arizona became a state. To make this evaluation, a wide array of published and unpublished documens were consulted (discussed in greater detail in the Introduction and listed in the appendices). This survey of hundreds primary and secondary sources yielded a wide spectrum of historical views of the Salt River, from federal surveys and reports, land settlement records created by the U.S. and Arizona governments, newspaper accounts, explorers' journals, diaries, early pioneer reminiscences, and many other records.

Taken as a whole, these records demonstrate that prior to and at the time of Arizona's statehood the Salt River was considered **not** navigable by virtually every contemporaneous observer. While there were instances of boats being floated on the Salt, these were the exception rather than the rule due to the nature of the river. The historical record amply demonstrates that the Salt River was highly erratic, subject to flooding and major channel changes, blocked by obstacles (both natural and manmade), and diverted for irrigation needs. Moreover, the Salt frequently sank beneath its bed, leaving a dry channel for miles, and when there was sufficient water for constant flows, the river became extremely dangerous, carrying logs and other debris. In short, the Salt River was not navigable on February 14, 1912.

INTRODUCTION

As is the case with other bodies of water in Arizona, the question of ownership of the Salt River's bed depends on what the river was like at the time of statehood. In general, if any body of water such as the Salt was commercially navigable at the time of statehood, the ownership of the bed passed to the state when it joined the Union due to the state's sovereignty. If the stream was not navigable, ownership of the bed remained in the federal government's hands until lands adjacent to the body of water were patented or otherwise disposed of. At that time, the bed of the stream or lake became the property of the individual land owners next to the river.[1]

PURPOSE AND METHODOLOGY: The purpose of this report is to examine what the Salt River was like at the time of Arizona's statehood on February 14, 1912, and to determine whether the stream prior to or on that date was considered commercially navigable. The chronological time period covered by this report extends from the pre-statehood era to the years shortly after statehood. The geographic range is from the Salt River's confluence with the Gila River upstream to Granite Reef Dam.

A wide variety of published and unpublished sources were utilized in creating this study. The vast majority of these documents are primary rather than secondary sources to obtain the most accurate descriptions of the river. To locate all relevant

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[1] The fundamental U.S. Supreme Court case confirming this doctrine is The Steamer Daniel Ball v. United States, 77 U.S. 999 (1871).

sources, Littlefield Research Associates developed a preliminary list of terms for searching many local, state, and national archives. We also used the list to search published primary sources. The list was supplemented as research brought to light new topics related to the Salt River. Since individual archives have different means of listing their holdings, we adapted our list to accommodate specific locations. Some of the terms most commonly used throughout the research were Salt, Granite Reef, Arizona Dam/Canal, Salt River Valley, navigation or navigable, irrigation, floods, Roosevelt, Consolidated Canal, Phoenix, Pima, Maricopa County, Apache Road, and Tempe.

In addition, individuals' names were used as search terms depending on the time period and archive involved. People whose names were searched include Charles Trumbull Hayden (one of the original settlers of the Phoenix area and owner of Hayden's Ferry), Carl Hayden (Charles Hayden's son, who represented the Phoenix area in Congress as a representative and a senator following statehood), John W. Swilling (who constructed the first irrigation ditch in the Phoenix area), Benjamin Fowler (president of the Salt River Valley Water Users' Association), Joseph H. Kibbey (judge in the 1892 water rights case Wormser, et al., v. Salt River Valley Canal Co.), Edward H. Kent (author of the famous 1910 "Kent Decree" adjudicating priorities of water users in the Salt River Valley), and many others.

In addition, a lengthy list of Arizona and federal government agencies' names was searched for records they may have generated

regarding the Salt River. Agencies (and their predecessors) whose names were searched include the Arizona State Land Department, Maricopa County Water Commissioner's Office, Arizona Attorney General's Office, the U.S. Congress, U.S. Geological Survey, U.S. Bureau of Land Management, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, U.S. Department of Agriculture Office of Experiment Stations, and U.S. Bureau of Indian Affairs, among others.

Research began at Arizona State University. The university's main library houses the Archives and Manuscript Division (which focuses on Arizona and Southwest history) in addition to the privately funded Arizona Historical Foundation. Both contain excellent collections of source materials (both published and unpublished), as well as an extensive collection of books focussing on the history of Arizona. The first step in research at Arizona State University was to search through the computer on-line manuscript database, which contains file titles from each manuscript collection at the library. Printed finding aids were also searched. The preliminary searches yielded over ten unpublished manuscript collections of prominent citizens and early settlers of the Phoenix area, including the extensive Hayden Family (Charles and Carl) papers and the Luhrs Family papers. The manuscripts in these collections provided many eyewitness accounts of the Salt River (such as descriptions of floods, the river's channel, and local activities taking place on or near the stream). The manuscript collections also provided useful insights on the

development of the Phoenix irrigation system, including its reservoirs, diversion dams, and canals. Numerous photo collections were also searched, and relevant photos have been reproduced here in Chapter Six.

Arizona State University was also useful for its collection of Arizona statutes. The statutes (mostly territorial) were searched for laws relevant to navigability and public land disposal. Furthermore, the library has an extensive collection of nineteenth- and early twentieth-century Arizona newspapers such as the Arizona Gazette and the Arizona Republican. Strong advocates for settlement of the evolving community of Phoenix, the newspapers extolled the virtues of life there as well as reported on the use of the Salt River. These two papers and others were searched for articles that would provide insight to the Salt River's characteristics.

Also useful was the University of California, Berkeley, which is the location of the Water Resources Center Archives. Although located in California, this library is one of the premier depositories for both manuscript collections and published government reports relating to water resources in the entire United States (particularly the American West). The Water Resources Center Archives contains manuscript collections of the papers of prominent civil engineers, whose work dealt extensively with irrigation, flood control, and hydroelectric power. Included are the papers of Elwood Mead (head of the U.S. Reclamation Service in the 1920s), James Dix Schuyler (who did consulting engineering work

in the Salt River Valley), and other people active in solving the water problems associated with the arid and semi-arid West. The Water Resources Center Archives also holds many published government documents relating to water issues, including a complete set of published U.S. Geological Survey Water Supply Papers and Bulletins (many of which were relevant to the history of the Salt River Valley) as well as all of the U.S. Reclamation Service Annual Reports published around the time of Arizona statehood.

The Bancroft Library, also at Berkeley, is one of the most important depositories for unpublished primary source materials and rare secondary source records on the history of the American West. Collections at the Bancroft relating to the Phoenix area were reviewed as well as published reports of nineteenth-century explorations of the area. Since many of the individuals who visited the region were there specifically to report on its potential, their reports are especially useful to ascertaining the historical nature of the Salt River.

Following research at the Bancroft Library and the Water Resources Center Archives, reports and studies conducted by U.S. government agencies were reviewed. Most of these reports covered such topics as flood control, irrigation, and the utilization of natural resources in the Salt River Valley. These documents provided descriptions of the Salt River at different points in time leading up to and shortly after statehood. Some of the reports are specific to the Salt River, but much of the information found was contained in larger studies on Arizona and the Salt River Valley.

In addition, a computer search was done of files compiled by Congressional Information Services (CIS) to find Congressional documents, hearings, and reports relevant to the Salt River.

In addition to the sources obtained at Arizona State University and the University of California at Berkeley, documents held by the U.S. Bureau of Land Management in Phoenix were reviewed -- records that are some of the most important concerning the Salt River around the time of statehood. The Bureau of Land Management holds nineteenth-century U.S. General Land Office surveys carried out to prepare the public domain for homesteading; these records include original surveyors' plats and field notes. Since surveyors were required to "meander" all navigable bodies of water and to keep detailed notes of these meanders, survey documents are vital to understand what the river was like at the time of survey. (See beginning on page 11 for a more detailed discussion of how surveys were to be conducted.) While surveys took place for different areas along the Salt River at different times, initial surveys were done in 1868 and resurveys prior to statehood were carried out in 1888, 1899, and 1910-1911. Thus, the surveys are especially useful to an historical study of the Salt River's characteristics.

The Phoenix office of the U.S. Bureau of Land Management also provided copies of U.S. General Land Office Master Title Plats and Historical Indexes. These records were used to determine how the federal government disposed of the public lands in Arizona through which the Salt River flowed. From this material, any U.S. patent that either overlaid or bordered the Salt River was obtained.

Federal patents were critical in determining how the U.S. government viewed the public lands in Arizona. If federal officials had considered the Salt River to be navigable, they would not have deeded out land lying in the channel or bed of the river. However, there is no indication in over 225 federal patents overlying the Salt River in the study area that the U.S. government hesitated to grant title to the bed and the banks of the river to patent applicants. (See Chapter 2 beginning on page 67 for a more detailed discussion of the significance of federal patents.) The U.S. National Archives in Washington provided the supporting paperwork for federal land patents such as applications and affidavits of witnesses. Federal patents and their files, combined with historical maps obtained from the U.S. Geological Survey, were used to create Exhibits 1-4, which illustrate the location of all patents and federal land grants along the Salt River. (See maps folded inside front pocket of this report.)

Additional research at archives in the Phoenix area was carried out. This included contacting various local archives and the Arizona Historical Society to determine their respective holdings. Furthermore, the Arizona State Archives in Phoenix provided more rare state and territorial government documents and manuscript collections. These materials included the unpublished papers of agencies such as the Arizona State Land Department, the Arizona Water Commissioner, the Arizona State Planning Board, and the Arizona Secretary of State. The papers of the State Land Department were particularly useful for historical information on

how the state disposed of the lands along the Salt River granted to it by the federal government.

After reviewing the historical records of the Arizona State Land Department at the State Archives, research was also done at the agency's Phoenix office. Although most of the patent information for land along the Salt River was found at the U.S. Bureau of Land Management in Phoenix and the U.S. National Archives in Washington, D.C., the Arizona State Land Department provided copies of patents issued by Arizona in parcels granted to the state by the federal government. Approximately twenty-five state patents were eventually reviewed. (See folded map in back pocket of this report for the location of these state patents.) Some of the corresponding application files for the state patents were also obtained and reviewed.

The Salt River Project Archives in Tempe was also a critical location for research. The Project has an extensive archival collection, including many documents copied from the U.S. National Archives' Record Group 75 (U.S. Bureau of Indian Affairs) and Record Group 115 (U.S. Bureau of Reclamation). These documents relate to the Pima-Maricopa Indians and the Salt River Project, respectively. In addition to collecting documents from the U.S. National Archives, the Project also maintains an excellent collection of historical photographs of the Salt River. This collection was searched thoroughly and copies of particularly demonstrative photos have been reproduced in Chapter 6 of this report. Furthermore, the newspaper clipping collection housed by

the Salt River Project was extensive. The clippings supplemented newspaper research done at Arizona State University.

The material found at the Salt River Project Archives was also useful as a lead-in to research at the U.S. National Archives in Washington, D.C. While at the National Archives, a wide variety of federal agency files, including the U.S. Bureau of Indian Affairs, the U.S. Army Corps of Engineers, the U.S. General Land Office, the Office of the Secretary of Interior, and the U.S. Geological Survey, were searched. These records contain unpublished paperwork substantiating the conclusions gleaned from published government documents.

The Rocky Mountain branch of the National Archives was also visited to undertake a more thorough search of Record Group 115 (U.S. Bureau of Reclamation). These records are organized into two chronological periods, with the 1902-1919 group containing material most relevant to this study. While in Denver, the Salt River Project histories, historical engineering data, preliminary investigations, and correspondence files were all searched. These records provided a rich source of information from an agency directly involved with management of the river around the time of statehood.

In addition to archive work, historical water rights cases were searched to determine the nature of the Salt River prior to Arizona's statehood. These included M. Wormser, et al. v. Salt River Valley Canal Company (1892) and Patrick T. Hurley v. Charles F. Abbott, et al. (1910). The two cases were especially important

to the development of the Salt River Valley because they focussed on dividing the river's resources among many concerned parties.

ORGANIZATION OF REMAINDER OF REPORT: Based on this extensive research, it became evident that the most important records dealing with the Salt River were U.S. General Land Office original surveys and patent records (both federal and state). Therefore, the first two chapters of this report deal with the significance of those documents. Other government documents (both published and unpublished) will be discussed in Chapter Three. Chapter Four examines newspaper accounts of the Salt River. Following this in Chapter 5 is a review of miscellaneous documents (such as diaries, journals, and reminiscences). Photographs are discussed in the final chapter. The last section of the report contains a general summary and conclusions.

To facilitate reference throughout the main body of the report, footnotes run continuously rather than starting from number one in each chapter. An index and bibliographic appendices are attached at the end.

CHAPTER 1: U.S. GOVERNMENT HISTORICAL RECORDS -- FEDERAL SURVEYS

One of the largest and most important groups of records created in relation to the Salt River prior to and around the time of Arizona's statehood in 1912 are those of the U.S. government, especially federal surveys done by the U.S General Land Office. When the United States became the owner of the vast territory acquired from Mexico after the end of the Mexican-American War in 1848, federal officials were anxious to determine the value of what the U.S. had gained. Moreover, they wanted to prepare the region for orderly occupation by American settlers to solidify control over the region. To ready the new lands for homesteading and to record those lands' characteristics, the federal government undertook formal surveys conducted by the U.S. General Land Office -- predecessor of today's U.S. Bureau of Land Management. Because those surveys were highly detailed, the original plats of the area near the Salt River and the related survey field notes contain a wealth of information about the nature of that stream. Surveys (and some limited resurveys) in the Salt River area prior to Arizona statehood were done in 1868, 1888, 1899, and 1910-1911.

SURVEYORS' MANUALS: Due to the need for accuracy and consistency in carrying out the federal surveys, the U.S. government issued a series of manuals designed to direct surveyors in their work. To grasp the significance of these manuals in relation to establishing whether bodies of water were deemed navigable or non-navigable, it is important to understand the books' provisions and how they changed over time.

The 1851 Manual: The 1851 version of Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations governed how some of the earliest public land surveys were done in the American West. This manual had been adopted by the U.S. General Land Office to standardize survey work in California and Oregon, which were the most significant areas of western American settlement in the late 1840s. The manual was the first formal surveying handbook issued by the federal government to provide guidance for surveyors mapping the vast public domain acquired from Mexico; previously, the U.S. government had issued directions to surveyors in the field on an individual basis or through Surveyors General assigned to specific territories.[2]

The Instructions to the Surveyor General of Oregon provided that public lands were to be subdivided into a series of ever-smaller grids within grids to allow the precise location of individual tracts. This system would facilitate the disposal of the public domain in an orderly fashion and at the same time record the characteristics of that land in substantial detail. The largest grids were to be six miles square and were to be created by the surveying of township and range lines. The directions in the

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[2] The Instructions to the Surveyor General of Oregon is reprinted in C. Albert White's A History of the Rectangular Survey System on pages 433-456. White's book was published by the U.S. government in 1983 as a review of all practices used by federal surveyors on public domain lands since the initial surveys of the Old Northwest (today, Ohio and other parts of the upper Midwest) were undertaken in the late 1700s. Aside from a detailed history of those procedures, White's book reprints many of the original surveying instructions. See C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983).

Instructions to the Surveyor General of Oregon providing for the establishment of these large blocks derived from the same process that had been used in other earlier public land territories and states, and the size of the blocks was based on Thomas Jefferson's original estimate that each block, composed of many small farms, would be the proper size to support a small town at its center. Jefferson's ideas were first enacted into law in the Land Ordinance of 1785, and the first surveys under this legislation were done what is today the State of Ohio. The grid procedure was used in most new territories added to the United States in the years that followed.

To establish township and range lines, a base line and meridian were chosen as starting lines within the state or territory to be surveyed. In Arizona, the initial base line and meridian intersected at a point on a hill just south of the junction of Salt and Gila rivers. That location had been chosen in 1865 by John A. Clark, Surveyor General of New Mexico Territory (which until 1868 included Arizona) to begin the Arizona surveys. The beginning marker was originally established by the Mexican Boundary Commission in 1851 to create a point on the U.S.-Mexico border prior to the Gadsden Purchase of 1853, which created the present boundary between the United States and Mexico. Actual surveys did not begin in Arizona, however, until 1871.[3] Using the Gila and Salt River Base and Meridian to start, township and range

[3] C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 137, 147.

lines were run in Arizona by federal surveyors working their way gradually north and south to create township lines and east and west to establish ranges. The 36 one-square-mile blocks that resulted were called townships (as distinct from township lines), and they were numbered in relation to the initial base and meridian on the basis of being north or south and east or west. For example, the first township to the north and east of the intersection of the Gila and Salt River Base and Meridian was identified as township 1 north, range 1 east. The township directly north of that was township 2 north, range 1 east, and the township to the east of that point was township 2 north, range 2 east. All townships to the south and west of the initial base and meridian were identified in a similar fashion. In the region of concern to this report -- the area along the Salt River from its confluence with the Gila River upstream to Granite Reef Dam -- the lands examined lie in townships 1 and 2 north and ranges 1 to 6 east.

Simply translated, this means that the area of focus is in the 1st and 2nd tiers of townships north of the Gila and Salt base line and in the 1st to the 6th tiers of townships east of the Gila and Salt meridian. With regard to the specific townships through which the Salt River runs, this study involves lands that lie in township 1 north, ranges 1 through 5 east, and township 2 north, ranges 5 and 6 east. The respective township and ranges can be easily located on the U.S. Geological Survey's relatively recent topographical maps of the region. The U.S. Geological Survey

quadrangle maps covering the study area (going upstream from the confluence of the Salt and Gila rivers) are "Fowler, Ariz.," 1952, photorevised 1982 (see page 53); "Phoenix, Ariz.," 1952, photorevised 1982 (see page 54); "Tempe, Ariz.," 1952, photorevised 1967 and 1973 (see page 55); "Mesa, Ariz.," 1952, photorevised 1982 (see page 56); "Buckhorn, Ariz.," 1956, photorevised 1982 (see page 57); and "Granite Reef Dam, Ariz.," 1964, photorevised 1974 (see page 58). All of the above maps have a scale of 1:24,000.

With exterior township and range lines established, federal surveyors subsequently divided each township into thirty-six sub-blocks called "sections," most of which were 640 acres, or one mile square. Due to the curvature of the earth, the sections that ran along the western and northern edges of each township were sometimes slightly adjusted to be more or less than a square mile. The sections were numbered within each township in an "S" fashion beginning with the northeast square and heading west for sections one through six. Section seven then appeared immediately south of section six, and sections then went east through section twelve. The remaining sections were numbered in the same "S" fashion until section thirty-six was reached in the southeastern most part of the township.

Surveyors laying out the township, range, and section lines were provided with very precise instructions for measuring these lines because accuracy was critical for these lands to be transferred out of the public domain in a reliable manner. In addition, for those areas remaining in the public domain, the

precise rules for surveying and for noting the characteristics of the land gave the U.S. government an extremely valuable record of what it owned through the field notes that surveyors were required to make. The field notes were to include any notable features of the land such as streams, rivers, lakes, roads, or other prominent landmarks. Using their field notes, surveyors were then to draw and forward original survey maps to the Surveyor General of the respective state or territory along with the accompanying field notes for final approval.

The Instructions to the Surveyor General of Oregon contained several provisions that are relevant to navigable bodies of water and other obstructions. First, the instructions provided that when surveyors encountered "impassable obstacles, such as ponds, swamps, marshes, lakes, rivers, creeks, &c.," they were to extend the survey line from the opposite side of the obstacle using triangulation or other surveying techniques. In addition, the surveyors were to "state all the particulars in relation thereto in your field book." Moreover, the instructions continued,

> at the intersection of lines with both margins of impassable obstacles, you will establish a Witness Point, (for the purpose of perpetuating the intersections therewith) by setting a post, and giving in your field book the course and distance therefrom, to two trees on opposite sides of the line, each of which trees you will mark with a blaze and notch facing the post; but on the margins of navigable water courses, or navigable lakes, you will mark the trees with the proper number of the fractional section, township, and range.[4]

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[4] Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations (1851), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 438.

The Instructions to the Surveyor General of Oregon also provided that when surveyors encountered navigable bodies of water, special survey markers called "meander corner posts" were to be "planted at all those points where the township or section lines intersect the banks of such rivers, bayous, lakes, or islands, as are by law directed to be meandered."[5] (Federal legislation directing that navigable bodies of water be meandered was first passed in 1796, but that law did not specify what constituted navigability. Nonetheless, the 1796 law is now codified in 43 U.S.C. 931.) Therefore, where township, range, section, or fractional section lines encountered bodies of water, witness posts were to be established if those bodies were **not** navigable, but meander corner posts were to be placed where the lines intersected navigable bodies of water. As the instructions explained, surveyors were to note

> [i]ntersections by line of **water objects.** All rivers, creeks, and smaller streams of water which the [survey] line crosses; the distance on line at the [witness] points of intersection, and their **widths on line."** [Emphases in original.]

Surveying lines that intersected navigable bodies of water were to be done as follows:

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[5] Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations (1851), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 439. On the federal legislation mandating meanders of navigable bodies of water, see White, A History of the Rectangular Survey System, p. 30.

> In cases of **navigable streams**, their width will be ascertained between **meander corners**, as set forth under the proper heading. [Emphases in original.][6]

Aside from these general directions, surveyors were also given precise instructions for measuring the sinuosities of navigable bodies of water, including rivers, streams, lakes, ponds, or bayous. Between the meander corner posts, the edges of the banks were to be measured going downstream by recording degree bearings. The details of this meander surveying were to be recorded in the surveyor's field book as a separate set of records from the surveys of township, range, and section lines.[7]

Finally, as if these instructions were not specific enough, the Instructions to the Surveyor General of Oregon contained detailed examples of surveying notes so that field surveyors would understand virtually any type of circumstance they might encounter.[8]

The 1855 Manual: Between 1851 and 1864, the U.S. General Land Office published only one revised version of the 1851 work. The 1855 manual (bearing the lengthy title Instructions to the Surveyors General of Public Lands of the United States, for Those

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[6] Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations (1851), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 444.

[7] Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations (1851), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 442.

[8] C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), passim.

Surveying Districts Established in and Since the Year 1850; Containing Also, A Manual of Instructions to Regulate the Field Operations of Deputy Surveyors, Illustrated by Diagrams) contained more detail than the 1851 instructions. Nevertheless, it remained virtually identical in substance with regard to recording navigable and non-navigable bodies of water.[9]

The 1864 Instructions: Nine years after the 1855 manual had appeared, the U.S. General Land Office began to modify its instructions for how surveyors dealt with navigable and non-navigable bodies of water. Therefore, the 1851 and 1855 instructions, as modified in 1864, defined how the earliest federal surveyors in Arizona recorded bodies of water because those surveys commenced in 1868. In 1864, the 1855 surveyors' manual was amended by Instructions to the Surveyors General of the United States, Relating to Their Duties and to the Field Operations of Deputy Surveyors. The 1864 revision made no changes to the section of the 1855 manual that dealt with "insuperable objects on line." In fact, the 1864 amendments did not discuss these instructions at all, presumably leaving this part of the 1855 manual intact.

Regarding meanders and navigable streams, the 1864 amendments added some important criteria to which streams would be meandered:

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[9] For the 1855 discussion of how bodies of water were to be recorded, see Instructions to the Surveyors General of Public Lands of the United States, for Those Surveying Districts Established in and Since the Year 1850; Containing Also, A Manual of Instructions to Regulate the Field Operations of Deputy Surveyors, Illustrated by Diagrams (1855), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 458, 461, 464-465.

> Rivers not embraced in the class denominated "navigable" under the statute [see page 17 regarding this law], but which are well-defined natural arteries of internal communication, and have a uniform width, will be meandered on **one bank**. [Emphasis added.]

The instructions added that for the sake of consistency, one-bank meanders were to be done on the right (looking downstream) unless obstacles made it necessary to switch to the left bank. If a change to the left were made, it was to be done at a point where a survey line crossed the stream and recorded in the field notes.[10]

The 1881 Instructions: On May 3, 1881, the U.S. General Land Office once again updated its directions to federal surveyors by issuing Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims. In this manual (which governed how the 1888 resurvey of part of the Salt River area was done), much of the instructions remained the same as in the 1855 manual as amended in 1864, including, for example, how surveyors were to establish witness posts at intersections with non-navigable "insuperable objects on line." Here, as in 1851 and 1855, surveyors were told that when they encountered obstacles such as ponds, swamps, lakes, rivers, and creeks, they were to use triangulation to establish the distance across those non-navigable obstacles on line. Also as in the 1851 and 1855 manuals, surveyors were to set a witness post on the line on each side of obstacle,

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[10] Instructions to the Surveyors General of the United States, Relating to Their Duties and to the Field Operations of Deputy Surveyors (1864), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 504.

and they were to measure to two trees on opposite sides of the line for each post. Each tree was to be marked with a notch and blaze facing the post, and the degree bearing and distance from the trees to their respective witness posts on line were to be noted in the field notes.[11]

For navigable bodies of water, as had been the case in the 1851 and 1855 manuals (as amended in 1864), the surveyors were told that "on the margins of navigable water-courses, or navigable lakes, you will mark the trees with the proper number of the fractional section, township and range." And similar to the 1851 and 1855 instructions, the 1881 manual provided that "[m]eander corners are established at all those points where the lines of the public surveys intersect the banks of such rivers, bayous, lakes, or islands as are by law directed to be meandered."[12] (See page 17 above for the meaning of the phrase "as are by law directed to be meandered.")

In terms of how meanders were to be carried out, the 1881 manual repeated the information from the 1855 manual as well as the 1864 addition that rivers that were not navigable "under the

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[11] Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims (1881), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 516.

[12] Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims (1881), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 516-517.

statute" but that were "well-defined natural arteries of internal communication" were to be meandered on one bank only. The balance of the instructions for meandering was also drawn from either the 1855 instructions or the 1864 amendments.[13]

The 1890 Manual: Nine more years elapsed before the U.S. General Land Office revised its surveying instructions. On January 1, 1890, the agency issued its Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims. Many of the surveying instructions were identical or nearly identical to the previous work, including those for recording major obstacles. For example, the 1890 instructions about how to chronicle "insuperable objects on line" continued to provide that surveyors were to use triangulation to measure across the obstruction. Surveyors were still also instructed to set a witness post on line at the edge of non-navigable the obstacle, and to give the course and direction to two nearby trees on opposite sides of the line, each of which were to be notched and marked with a blaze facing the witness post. And, as had been the case in the 1855, 1864, and 1881 manuals, the 1890 directions also stated that for navigable bodies of water, meander posts were to be set where

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[13] Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims (1881), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 523-524.

lines intersected these obstacles, and meanders were to be run following the course of the river.[14]

A significant change had been made to the instructions for what bodies of water were to be meandered, however. Whereas in 1881, surveyors were to meander navigable streams (both sides) and any non-navigable body of water used for "internal communication" (on one side only), the 1890 manual deleted the instructions to meander non-navigable bodies of water that were used for "internal communication." In addition, the 1890 manual no longer told surveyors to meander streams that were considered navigable, as the 1881 manual had provided "under the statute." Instead, the 1890 instructions stated:

> Both banks of **navigable** rivers, as well as of all rivers not embraced in the class denominated as "navigable," the right angle width of which is **three chains** and upwards, will be meandered on **both** banks by taking the general courses and distances of their sinuosities, and the same are to be entered in the field book. Rivers not classed as navigable will not be meandered above the point where the average right-angle width is less than three chains. [Emphases in original.][15]

In short, there had been two changes to what should be meandered: 1) navigable bodies of water (1881 -- "as are by law directed to be meandered" and "under the statute"; 1890 -- "embraced in the class

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[14] Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims (1890), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 560.

[15] Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims (1890), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 568.

denominated as 'navigable'"), and 2) non-navigable streams (1881 -- used for "internal communication," one bank to be meandered; 1890 -- no reference to use for "internal communication," but more than three chains wide, both banks to be meandered).

The 1894 Manual: On June 30, 1894, the U.S. General Land Office issued its 1894 Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims. In relation to directions for meandering, the 1894 manual (which governed how the 1899 resurvey of some of the Salt River region was accomplished) had major changes in what bodies of water were to be meandered. The new instructions still called for bodies of water "embraced in the class denominated 'navigable'" to be meandered. In addition, as had been the case in the 1890 manual, all non-navigable bodies of water that were more than three chains wide were to be meandered, but here the 1894 manual added an important instruction. Both navigable and non-navigable streams (more than three chains wide) were to be meandered "at the ordinary **mean high water mark**" (emphasis in original), and their general courses and sinuosities were to be recorded in the appropriate field notebook. Furthermore, in another significant change, the 1894 manual provided that "[s]hallow streams, without any well-defined channel or permanent banks **will not be meandered**; except tide-water steams, whether more or less than three chains wide,

which should be meandered at ordinary high-water mark, as far as tide-water extends." (Emphasis in original.)[16]

The 1902 Manual: Shortly after the turn of the century, the U.S. General Land Office once again revised its surveying handbook, releasing Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims on January 1, 1902. There were significant differences between the 1902 manual (which dictated how the 1910-1911 resurvey of part of the Salt River area was carried out) and its 1894 predecessor regarding meandering. First, the 1902 manual observed that the term "meander" had frequently been misapplied in the past by surveyors, which had important implications for lands adjoining the meander lines. The 1902 manual stated:

> The running of meander lines has always been authorized in the survey of public lands fronting on large streams and other bodies of water, but does not appear to have been proper in other cases. The mere fact that an irregular or sinuous line must be run, **as in the case of a reservation boundary**, does not entitle it to be called a meander line except where it closely follows a stream or lake shore. The legal riparian rights connected with meandered lines do not apply in case of other irregular lines, as the latter are strict boundaries. [Emphasis added.][17]

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[16] 1894 Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims (1894), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 621.

[17] Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims (1902), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 717.

What the manual meant was that the beds and banks of bodies of water that were navigable (and thus meandered) were held by the states whereas the beds and banks of non-navigable bodies of water were held by the adjoining riparian land owners. Therefore, meander lines needed to be clearly identified and had to be distinct from other irregular survey lines, such as those utilized for marking the edges of Indian and other federal land reservations.

Regarding which bodies of water were to be meandered, the 1902 manual had one addition to the 1894 instructions. The new direction provided that streams less than three chains wide were not to be meandered

> except that streams which are less than three chains wide and which are so deep, swift and dangerous as to be impassable through the agricultural season, may be meandered, where good agricultural lands along the shores require their separation into fractional lots for the benefit of settlers. But such meander surveys shall be subject to rejection if proved unnecessary by field inspection.[18]

The 1902 manual also retained the instruction that shallow streams "without any well-defined channel or permanent banks, will not be meandered; except tide-water streams, whether more or less

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[18] Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims (1902), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 718.

than three chains wide, which should be meandered at ordinary high-water mark, as far as tide-water extends."[19]

SUMMARY AND CONCLUSIONS REGARDING SURVEYORS' MANUALS AND MEANDERING: In short, by the time Arizona entered the Union on February 14, 1912, there had been substantial revisions and alterations to the instructions to federal surveyors concerning how they were to mark and record the intersection of survey lines with non-navigable and navigable bodies of water. Although initially, only navigable bodies of water were to be meandered, that direction had been expanded over the years to include some non-navigable bodies of water. In addition, as the 1902 instructions illustrated, surveyors also used the term "meander" (frequently incorrectly) to identify irregular survey lines along reservation boundaries.

U.S. GOVERNMENT ORIGINAL SURVEYS OF LANDS ALONG THE SALT RIVER: Prior to Arizona's statehood in 1912, various areas along the Salt River were surveyed and resurveyed several times, both in relation to exterior township and range lines as well as for interior section and subsection lines. Because surveyors whose work involved marking only exterior lines did not have the responsibility to undertake meanders where necessary, the field notes of those surveys are of limited value to this report and therefore will not be discussed here. Instead, the field notes of

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[19] Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims (1902), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), p. 718.

interior surveys and resulting plats will be examined in detail for information regarding those surveyors' judgments and descriptions regarding the Salt River's navigability or non-navigability.

The interiors of the townships through which the Salt River flows between the confluence with the Gila River and Granite Reef Dam were surveyed initially by federal surveyors (and brothers) Wilfred F. and George P. Ingalls in 1868 (Wilfred undertook the surveys for township 1 north, ranges 1 to 5 east, and George did township 2 north, ranges 5 and 6 east). These surveys were carried out under the terms of the 1855 federal surveyors' Manual as modified by the 1864 Instructions.

Because of the importance of these initial federal surveys in relation to establishing the nature of the Salt River, they will be discussed in detail here. In general, the discussion will be in an up-river manner because the surveys were carried out moving away from the initial monument for the Gila and Salt River Base and Meridian. Within individual townships discussion will also be upriver by the location where the Salt River crossed interior lines. In terms of the field notes and resulting township plats, since surveyors' notes were compiled in the field and plats were later drawn based on the notes, the notes for each township survey will be discussed first followed by the corresponding plats.

1868 Interior Survey of Township 1 North, Range 1 East (Field Notes): Wilfred F. Ingalls surveyed the interior section lines of township 1 north, range 1 east, between March 4 and 12, 1868, under his contract dated February 18, 1868. The notes (and resulting

plat) indicate that the Salt River (or its bed) lay in parts of sections 31 to 36, as well as sections 25 and 26. In all of his encounters with the Salt River in this township, Ingalls followed the rules laid down in the 1851 and 1855 manuals (as modified by the 1864 Instructions) for denoting a non-navigable body of water in his field notes. No meander corner posts were set at any crossing of the Salt. Instead, Ingalls used witness posts indicating a non-navigable body of water (he referred to them as flags in some cases), and he employed triangulation to measure across the stream.[20]

Following the survey of interior section lines, Ingalls added the general description of the township, which he was required to do by his surveying instructions. Here, he provided his perception of the Salt River and other characteristics of the entire township. Regarding the Salt, he stated that there was "a very good ford across Salt River in sec 35" (near the northeastern boundary of today's Gila River Indian Reservation), perhaps suggesting a relatively shallow stream at that point.[21]

1868 Interior Survey of Township 1 North, Range 1 East (Plat): On October 8, 1868, the official plat of township 1 north, range 1

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[20] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N. Range 1 E. of the Gila and Salt River Meridian in the Territory of Arizona," March 12, 1868, pp. 1B-4, 14-17, 26-27, 38-39, 50, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/2].

[21] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N. Range 1 E. of the Gila and Salt River Meridian in the Territory of Arizona," March 12, 1868, pp. 67-68, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/2].

east -- as drawn from Wilfred Ingalls's field notes -- was approved by the Surveyor General's office in Phoenix, Arizona (see page 59 for a copy of this plat). While the map clearly shows the Salt River running along the township's southern edge, there is no indication of meander lines on either bank of that stream, nor are there any meander notes in the margins of the plat. Had the Salt River been deemed navigable, the data on meander degree bearings would have been recorded in the right-hand margin of the plat as well as in the respective field notes. No such notations appeared in either place for this township.

Moreover, the map carries the notation: "Aggregate Area of Public land 22,944.89 acres." While 36 sections on a flat globe would contain a total of 23,040 acres, since the earth is rounded, adjustments to the sections in the western and northern sections made this township's total acreage equal 22,943.89 acres (based on adding the acreages shown on the map in each section). While this is one acre less than the notation appearing in the margin of the map that the township contained 22,944.89 acres of public lands, the missing acre most likely is due to recording or mathematical error and is not because any land had been withheld from the public domain due to the navigability of the Salt River. Had the missing land been due to navigability, the acreage would have been substantially larger than merely one acre.[22]

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[22] U.S. General Land Office Survey Plat of Township 1 North, Range 1 East, Gila and Salt River Meridian, Oct. 8, 1868, U.S. Bureau of Land Management, Phoenix, Arizona [LRA box/file: 1/2].

1868 Interior Survey of Township 1 North, Range 2 East (Field Notes): Shortly after he had completed his survey of the interior lines for township 1 north, range 1 east, Wilfred Ingalls surveyed the interior lines for township 1 north, range 2 east. In the course of his survey, he encountered the Salt River in sections 13, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, and 30. Throughout much of this township, the Salt River was divided into two channels, the north and south branches, although the two combined briefly between sections 22 and 23 before splitting again into a north and south channel. There were also places where sloughs split off from one of the main channels and then rejoined that channel further downstream. There is no indication in the field notes that Ingalls considered the Salt River to be navigable. He set no meander corners and ran no meander lines. In each of his encounters with the Salt River's branches and sloughs he treated them in his field notes according to directions in the 1851 and 1855 manuals (as modified by the 1864 Instructions) for describing and marking non-navigable bodies of water, setting witness posts and using triangulation to measure across the stream.[23]

Aside from this indication that Ingalls did not consider the Salt River in this township to be navigable, additional information can be gleaned from his descriptions as he crossed the stream in various places. For example, on the line between sections 22 and

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[23] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N, Range 2 E of the Salt River Meridian in the Territory of Arizona," March 16, 1868, pp. 73, 99-100, 109, 111-112, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/6].

23, Ingalls's characterization of the North Branch indicates that it probably was not navigable:

> 18.50 [chains] To left bank of North channel of Salt River -- low sandy banks constantly shifting [river] runs S85W.[24]

Ingalls's depictions of the South Branch of the Salt River in this township, like those of the north branch, failed to indicate that that branch of the stream was navigable. No meander posts were set, and no meander lines were run. Moreover, the stream was so shallow in some locations that Ingalls could wade across it and did not need to use triangulation to measure its width. For instance, he encountered the South Branch of the Salt River on the line between sections 29 and 28. In his field notes, he recorded this branch as follows:

> 34.10 [chains] To South Channel of Salt River. 3.20 chs wide runs west -- not too deep to prevent measuring across it on line.[25]

Likewise, Ingalls's description of the South Branch on the line between sections 27 and 28 was similar to that for the line just downstream (between 29 and 28), including the notation that the stream was "not too deep to prevent measuring across it on line."[26]

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[24] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N, Range 2 E of the Salt River Meridian in the Territory of Arizona," March 16, 1868, p. 99, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/6].

[25] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N, Range 2 E of the Salt River Meridian in the Territory of Arizona," March 16, 1868, p. 109, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/6].

[26] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N, Range 2 E of the Salt River

(continued...)

1868 Interior Survey of Township 1 North, Range 2 East (Plat): The plat (see page 60) of township 1 north, range 2 east (approved by the Surveyor General on October 9, 1868), also gave no indication that Ingalls considered the Salt River's channels to be navigable. There were no meander lines drawn on the plat, and there were no meander details in the margins. Aside from this indication of the non-navigability of the Salt, other information on the plat supports the idea that the river was not used for commercial transportation. Roads drawn on the map connecting Phoenix and Wickenburg to Fort McDowell suggest that the river was not used for transportation. In addition, the total aggregate of public land indicated in the margin of the plat left no land outside the public domain due to the possibility of Arizona's future sovereignty as a state.[27]

1868 Interior Survey of Township 1 North, Range 3 East (Field Notes): When Ingalls had completed his survey of township 1 north, range 2 east, he began his work on the next township to the east, township 1 north, range 3 east. This survey was undertaken between March 27 and April 4, 1868. Throughout this entire township (which today includes downtown Phoenix), the Salt River flowed in two channels, identified by Ingalls respectively as the North Channel and the South Channel. One or both of these channels lay in parts

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[26](...continued)
Meridian in the Territory of Arizona," March 16, 1868, p. 97, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/6].

[27] U.S. General Land Office Survey Plat of Township 1 North, Range 2 East, Gila and Salt River Meridian, Oct. 9, 1868, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/6].

of sections 13 to 24, and in every case where Ingalls recorded crossing the stream, he set no meander corner posts. Instead, he used witness corners indicating a lack of navigability.[28] Certain section lines Ingalls found too difficult to survey due to their location either in the North or South channels or in the bottom lands between them. This precluded his determining whether to set meander corners or witness posts. Nevertheless, his explanation for why he did not survey these lines strongly suggests a stream (or streams) that were not navigable. For example, regarding the line between sections 16 and 21, Ingalls wrote:

> Note -- : Land on line bet secs 16 & 21 sandy -- subject to overflow and unfit for cultivation a large portion of it being washed or shifted about every season more or less.[29]

Again, for the line between sections 15 and 22, he explicitly stated that he did no survey there:

> Note: The line bet secs 15 & 22 running some distance in the river . . . subject to overflow and unfit for cultivation interspersed with numerous sloughs from the river. I do not run it.[30]

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[28] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N Range 3 E of the Gila and Salt River Meridian in the Territory of Arizona," March 27, 1868, pp. 171-172, 198, 203, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/8].

[29] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N Range 3 E of the Gila and Salt River Meridian in the Territory of Arizona," March 27, 1868, p. 183, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/8].

[30] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N Range 3 E of the Gila and Salt River Meridian in the Territory of Arizona," March 27, 1868, p. 172, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/8].

Such descriptions indicate that navigation on this part of the river would probably have been difficult, if not impossible. Ingalls offered no further explanation for not surveying the lines between sections 14 and 23 and 13 and 24 (near today's Sky Harbor Airport), but since those lines also ran along (according to the plat -- see page 61) one or the other channels of the river or between those channels, the same description that Ingalls offered for the lines between 16 and 21, and 15 and 22, would have applied to the lines between 14 and 23, and 13 and 24.

Ingalls's general description of the township contained a considerable amount of revealing information about the two channels of the Salt River, which continued to underscore Ingalls' opinion that the stream was not navigable:

> Salt River separates in two channels called North and South Channels with numerous sloughs running from one to the other runs through a loose sandy [? -- illegible in original] in the middle of the township from East to west -- It is continually washing away and changing its course. This Township is made fractional in consequence of the land bet the North and South channels being sandy and constantly washed and shifted by the river and unfit for cultivation.[31]

Finally, Ingalls concluded his comments on this township with a description of the new town of Phoenix, indicating that ancient irrigation had been practiced along the Salt. He added that recent settlers were reinstituting this aid to farming -- apparently with no concern for the river's potential navigability:

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[31] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N Range 3 E of the Gila and Salt River Meridian in the Territory of Arizona," March 27, 1868, pp. 212-213, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/8].

> A settlement called Phoenix was formed in the NE part of the Township during the winter of 1867 & 1868. It now contains about 50 persons who have displayed great energy in the construction of their "irrigation ditches" and the clearing of their lands and will this year bring under cultivation a large extent of [? -- illegible in original]. The settlement though young bears every evidence of thrift and prosperity. The land in this Tp. north of Salt River bears every evidence of having been under cultivation at some former time. The old esca [sic -- acequia] running through secs 1, 2 & 12 which evidently used to irrigate these lands is still in a good state of preservation.[32]

1868 Interior Survey of Township 1 North, Range 3 East (Plat): The plat of township 1 north, range 3 east, which was filed with the Surveyor General on December 2, 1870 (see page 61), illustrated the Salt River flowing in a westerly direction through the middle of the township in two channels and several sloughs. No meander lines are shown on the plat, and no meander data appear in the margins. Further suggesting that the Salt was not considered navigable are the presence of the irrigation canals described in the field notes. Water diverted from the river to serve farmlands, of course, could deplete supplies necessary to maintain navigability, but other historical documentary evidence to be discussed later in this report indicates that no objections were made to such diversions. With regard to the roads, one runs south of the river roughly parallelling it, while another is on the north side, again also roughly parallelling the river. The location and

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[32] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N Range 3 E of the Gila and Salt River Meridian in the Territory of Arizona," March 27, 1868, pp. 212-213, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/8].

direction of these roads strongly indicates that the river itself was not used to carry commerce or people.[33]

1868 Interior Survey of Township 1 North, Range 4 East (Field Notes): Wilfred Ingalls surveyed the interior lines of township 1 north, range 4, east between April 8 and 16, 1868. According to Ingalls's field notes and the related plat for this township (which today includes Tempe, Arizona), the Salt River was divided into two channels for part of its distance through this township, and in all instances where Ingalls encountered either channel or the combined river, he recorded that crossing in a manner consistent with the directions in the 1851 and 1855 manuals as well as the 1864 Instructions for non-navigable bodies of water. No meander corner posts were set; only witness posts. In addition, no meander lines were run.[34]

Ingalls then discussed the general characteristics of the township. As had been the case in the township downstream, he observed that settlers were taking water from the river to irrigate their lands and planned to expand this practice -- apparently with no objections from navigation interests:

> There are two esecas [sic -- acequias] taking water from Salt River in sec 7 and runs thence westward into Tp. 1 N R 8 E and which is used by the farmers for irrigating

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[33] U.S. General Land Office Survey Plat of Township 1 North, Range 3 East, Gila and Salt River Meridian, Dec. 2, 1870, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/8].

[34] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N Range 4 E of the Gila and Salt River Meridian in the Territory of Arizona," April 8, 1868, pp. 174-175, 221, 232, 243, 255, 264, 271-272, 276, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/10].

their lands. The settlers propose constructing another eseca taking the water from the river in sec 15 leading westerly to their adjoining Township.[35]

1868 Interior Survey of Township 1 North, Range 4 East (Plat): The plat for township 1 north, range 4 east (see page 62), was approved by the Surveyor General on October 21, 1868, and it continued to demonstrate that Ingalls consistently had treated the Salt River as non-navigable. The plat had no meander lines or meander data in the margins. Moreover, the irrigation ditches mentioned in the field notes' general description of the township were clearly present on the north side of the river. In addition, the plat indicated several things demonstrating that Surveyor Ingalls did not consider the Salt River to be navigable. First, suggesting that the river was not used for transportation is the fact that like further downstream several roads appear on the map. One of them directly paralleled the main stem of the North Channel, passing in an east-west direction by a settler's cabin and continuing to the irrigation ditch in section 16. Veering north from this road was another going northeast through sections 7, 6, and 5. This road ran from Wickenburg to Fort McDowell. Another road extended from the North Channel of the river between the two irrigation ditches that headed in section 7. This road crossed into township 1 north, range 3 east. Finally, a road paralleling the South Channel of the Salt River in section 19 turned southeast

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[35] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N Range 4 E of the Gila and Salt River Meridian in the Territory of Arizona," April 8, 1868, p. 283, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/10].

and ran through sections 20, 29, 32, and 33. This road was described as the road to Maricopa Wells. Since these roads roughly paralleled the Salt River or in some cases linked to areas connected to the Salt (such as Fort McDowell on the Verde River), their presence strongly suggests that contemporaneous observers did not consider the Salt River to be navigable.

Finally, also suggesting that the Salt River was not navigable is the fact that the figure in the margin of the plat for aggregate area of public lands -- 23,027.06 acres -- is the cumulative total of all the sections on the plat. In other words, no acreage was subtracted for the bed and banks of the river due to the future possible sovereignty of the State of Arizona.[36]

1868 Interior Survey of Township 1 North, Range 5 East (Field Notes): Moving upstream, Wilfred Ingalls surveyed the interior lines to township 1 north, range 5 east, between April 20 and 29, 1868. The Salt River flowed through the northwest corner of this township (which today is part of the Salt River Indian Reservation), entering from the north in two channels and merging just before flowing across the western boundary. As had been the case downstream, at each point where Ingalls crossed the channels of the Salt, he recorded that encounter in a manner consistent with federal instructions for non-navigable bodies of water. Witness posts were set on both banks, and triangulation was used to measure

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[36] U.S. General Land Office Survey Plat of Township 1 North, Range 4 East, Gila and Salt River Meridian, Oct. 21, 1868, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/10].

across on line. No meander corner posts were established anywhere in the township at any crossing of the Salt.[37]

As he had done for other townships along the river, Ingalls added at the end of his notes a description of this township. Once again, he observed the potential for expanding irrigated agriculture in the area, but he made no mention of possible conflicts with navigation concerns. Moreover, at the very end of his general description, he offered a depiction of the stream that indicated that regular navigation on the river was unlikely:

> The bottom lands can be easily irrigated with water from the Salt River and will doubtless produce grain or vegetables adapted to the climate. This land resembles that which the Maricopa and Pima Indians have under cultivation near the Gila River at what is called the Maricopa and Pima villages, upon which land they raise barley, wheat, corn, etc., etc., to a considerable extent. The mesa can be irrigated but only with much more expense that would be the case with the bottom lands as it lies about 25 or 30 ft. above the bottoms. . . . **The North and South channels of Salt River are now of about equal size -- but as they run through sandy soil are constantly changing position and size.** [Emphasis added.][38]

1868 Interior Survey of Township 1 North, Range 5 East (Plat): The plat of township 1 north, range 5 east (see page 63), reflected Ingalls's notes and his estimation that the Salt River was not

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[37] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N Range 5 E of the Gila and Salt River Meridian in the Territory of Arizona," April 29, 1868, pp. 319-320, 329-332, 346-349, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/12].

[38] Wilfred F. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 1 N Range 5 E of the Gila and Salt River Meridian in the Territory of Arizona," April 29, 1868, pp. 353-355, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/12].

navigable. Approved by the Surveyor General on October 22, 1868, the plat suggested that the river was not navigable by indicating that the land between the two channels of the Salt River was "sandy & subject to overflow, soil 3rd rate." The presence of roads roughly parallelling the Salt, the lack of meander lines or marginal meander notes, and the cumulative total of aggregate public lands listed on the map all supported the field notes' assessment that the Salt River was not considered navigable by Ingalls.[39]

1868 Interior Survey of Township 2 North, Range 5 East (Field Notes): Much as Wilfred F. Ingalls had treated the Salt River as non-navigable in his surveys of township 1 north, ranges 1 through 5 east, his brother, George P. Ingalls, reached the same conclusion for township 2 north, ranges 5 and 6 east. In May 1868, George Ingalls surveyed the interior section lines to township 2 north, range 5 east. The Salt River entered this township in one channel in the southeastern part of the township, split into two channels, and exited the township on the southern border. Crossing the Salt's channels several times as he ran survey lines, George Ingalls consistently set no meander corners, despite the requirements spelled out in the 1851 and 1855 manuals as well as the 1864 Instructions that meander corner posts were necessary where interior lines crossed navigable streams. No meander lines were run either. Instead, George Ingalls -- like his brother

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[39] U.S. General Land Office Survey Plat of Township 1 North, Range 5 East, Gila and Salt River Meridian, Oct. 22, 1868, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/12].

Wilfred -- treated the channels of the Salt as non-navigable at each encounter, and he established witness posts to triangulate the distance across in each locale. Also adding to a picture of a non-navigable stream, George Ingalls noted that the water in the Salt's channels had a "rapid current."[40]

In the general description of this township, Ingalls added the further observation regarding the Salt River implying that the stream was not navigable:

> Its banks are generally low and sandy and it often shifts its bed during a very high stage of the waters. It affords many facilities for irrigating the surrounding country.[41]

1868 Interior Survey of Township 2 North, Range 5 East (Plat): The plat drawn from George Ingalls's field notes for township 2 north, range 5 east (see page 64), was approved by the Surveyor General on December 31, 1868. The plat, like the notes, demonstrated in at least two ways that George Ingalls did not considered the Salt River to be navigable. First, the margin of the map indicated there were a total of 22,991.13 acres of public land in the township, which conformed with the total acreage assigned to each section on the plat. Therefore, no acreage had

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[40] George P. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 2 N Range 5 E of the Gila and Salt River Meridian in the Territory of Arizona," May 25, 1868, pp. 428-429, 438-439, 440-443, 453-454, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 2/2].

[41] George P. Ingalls, "Field Notes of the Survey of the Subdivision Lines of Township 2 N Range 5 E of the Gila and Salt River Meridian in the Territory of Arizona," May 25, 1868, p. 494, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 2/2].

been withheld as not being public lands due to the presence of the two channels of the Salt River. In addition, a road was drawn running roughly parallel to the Salt channels. The plat identified this road as running from Wickenburg to Fort McDowell, and its presence paralleling the river suggests that the stream was not used for transporting people or goods.[42]

1868 Interior Survey of Township 2 North, Range 6 East (Field Notes): The last township to be surveyed in 1868 below the present-day location of Granite Reef Dam was township 2 north, range 6 east. George Ingalls completed surveying the interior lines of this section on June 11, 1868. The survey was a "fractional" survey -- meaning it did not cover the entire township. Only the southern part was surveyed (through which the Salt River flowed) because Ingalls deemed most of the northern half of the township too rough and uneven for farming.

In every instance where Ingalls encountered the Salt River in surveying the interior lines of this fractional township, he consistently treated the river as being non-navigable. He set no meander corner posts, and he did no meander measurements. Instead, he established witness posts and measured across the stream by triangulation. Moreover, in denoting his measurements at one

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[42] U.S. General Land Office Survey Plat of Township 2 North, Range 5 east, Gila and Salt River Meridian Dec. 31, 1868, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 2/2].

crossing, Ingalls wrote in his field notes that the "water not too deep to prevent measuring across it on line."[43]

Indicating the fluctuating levels of the Salt River's flows, Ingalls wrote in the general description of the township:

> The bottom lands are good 1st & 2nd rates and is [sic -- are] situated on both sides of Salt River, a fine stream of pure water running in a westerly direction through the middle of the township. It is fordable during six or seven months of the year in sec 29 at the crossing of the Fort McDowell & Maricopa Wells Road.[44]

1868 Interior Survey of Township 2 North, Range 6 East (Plat): The plat based on Ingalls's field notes for the survey of township 2 north, range 6 east (see page 65), was approved by the Surveyor General on December 31, 1868. The plat did not show any meander lines nor were there meander bearings listed in the margin of the plat. Further indicating a lack of navigability, the plat illustrated in two places the location of the old channel of the stream. While channel changes suggest difficulty for navigation, the presence of roads connecting to Fort McDowell underscore this

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[43] George P. Ingalls, "Field Notes of the Survey of the Subdivision of Fractional Township 2 N Range 6 E, of the Gila and Salt River Meridian in the Territory of Arizona," June 11, 1868, pp. 565, 570-571, 576, 578, 595-596, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 2/4]. The quotation is at 595-596.

[44] George P. Ingalls, "Field Notes of the Survey of the Subdivision of Fractional Township 2 N Range 6 E, of the Gila and Salt River Meridian in the Territory of Arizona," June 11, 1868, p. 605, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 2/4].

conclusion by implying the Salt was not used to carry goods or people.[45]

U.S. GOVERNMENT RESURVEYS OF LANDS ALONG THE SALT RIVER: While the entire study area through which the Salt River flowed was surveyed in 1868, parts of those townships were resurveyed in 1888 by L.D. Chillson, in 1899 by Herbert R. Patrick, and in 1910-1911 just before Arizona statehood by Robert A. Farmer.[46] These surveys were all done to define either the boundaries and interior lines of the Salt River Indian Reservation or the Gila River Indian Reservation. While parts of the surveys involved meanders of portions of the Salt River, those meanders were to define the reservations' borders, not to identify a navigable stream. (See page 25 above regarding the U.S. General Land Office's comments about such Indian reservation boundary surveys.) However, the descriptions offered in the field notes and the details on the plats continued to paint a picture of the Salt as a non-navigable body of water. For clarity reasons, the two Salt River Indian Reservation boundary surveys (1888 and 1910-1911) will be discussed

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[45] U.S. General Land Office Survey Plat of Township 2 North, Range 6 East, Gila and Salt River Meridian, Dec. 31, 1868, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 2/4].

[46] There were also a few resurveys of areas along the Salt after Arizona's statehood, but since those surveys did not deal with the river as it existed prior to 1912, they are not discussed here. Nevertheless, the results of those surveys do not contradict the indications of non-navigability found in the notes and plats of the pre-1912 surveys. See, for example, U.S. General Land Office, "Dependent Resurvey of a Portion, Township No. 1 North, Range No. 1 East, Gila and Salt River Meridian, Arizona -- Gila River Indian Reservation," Sept. 2, 1920, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/2].

first followed by the survey of the Gila River Indian Reservation border (1899).

1888 Interior Resurvey of the Northwest Corner of Township 1 North, Range 5 East (Field Notes): In March 1888, L.D. Chillson resurveyed the northwest corner of township 1 north, range 5 east to establish the boundaries of the Salt River Indian Reservation. His survey, done under instructions in the 1881 surveyors' manual (see page 20), included parts of sections 3, 4, 5, 6, 7, and 8. The southern boundary of the survey was the right (north) bank of the Salt River. Because the center of the river was defined as the southern border of the reservation, Chillson meandered the right bank, and his field notes record setting meander posts at each point where a section line or quarter section line reached the edge of the Salt River. His notes clearly indicated that these were meander posts, and he recorded that he had marked each post with "M.C." (meander corner). Aside from the survey lines and meander posts, Chillson observed that most of the area was cultivated by Indians, and he recorded crossing or passing irrigation ditches, fences, and Indian huts at many points. Finally, Chillson wrote that the "Arizona Canal runs through the northern portion of the [Salt River Indian] Reservation, their dam being about 3 miles south of where the Verde River empties into Salt River."[47]

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[47] L.D. Chillson, "Field Notes of Resurvey of Fractional Township 1 North, Range 5 East," March 28, 1888, pp. 1-61 (with quotation at 61), U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/12].

Chillson gave no indication that the Arizona Dam interfered with any navigation on the Salt River.

1888 Interior Resurvey of the Northwest Corner of Township 1 North, Range 5 East (Plat): The plat for Chillson's resurvey (see page 66) was approved by the Surveyor General on July 11, 1888. In the right margin, Chillson listed his "Meanders of the Right Bank of Salt River," and those meanders were drawn on the plat itself showing where the north bank of the river was located. There were no meanders either drawn or listed for the south bank of the Salt River. In addition, Chillson noted that much of the land involved in his resurvey was bottom land, and shading on the plat indicated that most of it was irrigated farmlands. He also drew and identified a major irrigation ditch, at least two other smaller ditches, several huts, and an old trading post.[48]

1910-1911 Resurvey of the Salt River Indian Reservation Boundary (Field Notes): In late 1910 and early 1911, Robert A. Farmer was directed to resurvey segments of the boundary of the Salt River Indian Reservation laying in townships 1 and 2 north, ranges 4 to 6 east. Part of the southern portion of this boundary (which had also been resurveyed by Chillson in 1899) was the middle of the Salt River, and to locate that line more accurately, Farmer

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[48] U.S. General Land Office Resurvey Plat of Part of Township 1 North, Range 5 East, July 11, 1888, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/12].

meandered the north bank of the stream as Chillson had done earlier.[49]

Farmer also noted the characteristics of the Salt River, particularly in township 2 north, range 5 east. Two channels of the Salt River existed in this township, a north and south channel, but in several places, there were sloughs connecting the channels. There were a variety of places where interior lines crossed the Salt River's channels, and in each place, Farmer established meander corners to mark the edge of the river, which in turn would help establish where the middle of the river (the reservation boundary) lay. There were also useful descriptions of parts of the channels. Heading south between sections 34 and 35, for example, Farmer noted at 45.60 chains a "wagon ford across channel, brs. N. and W." In section 34 itself, as he ran east through the middle of that section, Farmer observed that the water in the North Branch was eight inches deep, while the South Branch was completely dry.

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[49] Robert A. Farmer, "Field Notes of the Survey of the Subdivision of T. 1 N., R. 4 E., Sections 1 and 12, of the Gila and Salt River Principal Meridian in the State of Arizona," Dec. 1910, pp. 12, 17-20, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/10]; U.S. General Land Office Resurvey Plat of Township No. 1 North, Range No. 4, East of the Gila and Salt River Meridian, Arizona, March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/10]; Farmer, "Field Notes of the Survey of the Subdivision of T. 1 N., R. 5 E., Salt River Indian Reservation," Dec. 12, 1910, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/12]; Resurvey Plat of Fractional Township 1 North, Range 5 East of the Gila and Salt River Meridian, March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 1/12]; Farmer, "Field Notes of the Survey of the Subdivision and Meander Lines of Township No. 2 North, Range No. 6 East, of the Gila and Salt River Principal Meridian," Jan. 20, 1911, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 2/4].

When running the line through the middle of the south half of section 26, Farmer found the river to be four feet deep. Nevertheless, in another channel of the river in the same section, Farmer wrote: "3.80 [chains] Middle of channel of Salt River, course SW. (No water)."[50]

On the line between sections 25 and 26, Farmer established meander corners, but indicating that the river probably was not navigable, he wrote that he crossed the river in its bed, adding that this channel of the Salt was 200 chains wide but only one foot deep. He repeated this assertion when running the line south through the middle of section 25, yet when he resurveyed the line a few days later, the channel now had two to three feet of water running in it. At the second channel of the Salt on this line, Farmer again set meander corners, but attesting to the stream's lack of navigability, he also observed that while the channel was 200 chains wide, a road crossed it in the bed itself.[51] Other similar descriptions are scattered throughout the field notes of this township, indicating a river that varied widely in terms of depths and widths, even in just relatively short distances. The roads crossing the river and the mention of several channels and

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[50] Robert A. Farmer, "Field Notes of the Re-Survey of the Subdivision and Meander Lines of Township No. 2 North, Range No. 5 East of the Gila and Salt River Principal Meridian, Dec. 6, 1910, pp. 59, 72, 75, 108, 111, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 2/2].

[51] Robert A. Farmer, "Field Notes of the Re-Survey of the Subdivision and Meander Lines of Township No. 2 North, Range No. 5 East of the Gila and Salt River Principal Meridian, Dec. 6, 1910, pp. 20-21, 24, 27, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 2/2].

islands all contribute to a description of a river where reliable navigation would have been difficult at best.

1899 Survey of the Northern Boundary of the Gila River Indian Reservation (Field Notes): On June 6, 1899, the Commissioner of the General Land Office approved Herbert R. Patrick's contract to survey lands related to the boundary of the Gila River Indian Reservation, the northern part of which lay in the middle of the Salt River. Patrick's contract provided that he was to survey

> all that portion of the boundary of the Gila River Indian Reservation extending from a point four miles east from the confluence of the Gila and Salt Rivers, at the intersection of the meridional line with the center of low water channel of Salt River, southeasterly to the northwest corner of the old Gila Reservation; & also all the lines necessary for closing the Township & section lines in T1N, R1E, & Tns. 1 S, Rs 1 & 2 E, G. & S.R.B. & Mer, upon that portion of the boundary line of the Gila River Indian Reservation, extending from the Initial Monument in middle of Salt River, southeasterly to a point on line between Tps. 1 & 2 S; R 2 E., Arizona.

He was to undertake this survey in conformity with "the printed Manual of Surveying Instructions as revised and approved June 30, 1894" (see page 24 above) and any other special instructions issued by the Surveyor General. Patrick was to receive nine dollars per mile for surveying base, standard, meridian, and meander lines, seven dollars for township lines, and five dollars for section and connecting lines. Yet despite this financial incentive to run meander lines where necessary, Patrick did none as part of his survey.[52]

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[52] Contract and Bond No. 51, Herbert R. Patrick, June 6, 1899, Surveyors' Contracts, Record Group 49, Records of the U.S. General Land Office, U.S. National Archives, Washington, D.C. [LRA Box/File: 4/4].

Patrick began his work on October 17, 1899, and he noted that his instructions from the Surveyor General were for the

> [i]nitial Monument of this Reservation Boundary line to be established at the center of the low water channel of Salt River at a point due north of a point on the Base line distant 320 chains east of the Initial Monument of the Public Survey.

Patrick's encounters with the Salt River as he ran the line along the southern boundary of township 1 north, range 1 east, consistently indicated a shifting channel with many sand and gravel bars.[53] In addition, his general description of the region indicated a river that would have been difficult at best to use for navigation:

> The portions of Ts. 1 N & 1 S. R 1 E traversed by lines of this survey are 1st River bottom broken by channels, Islands; Sand and gravel bars, the islands so-called, being surrounded by water only at hi [sic] water, the permanent flow of water being small, estimate it to be 2000 miners inches at this time when not affected by rain in the mountains.[54]

SUMMARY AND CONCLUSIONS REGARDING U.S. GOVERNMENT SURVEYS AND RESURVEYS ALONG THE SALT RIVER: Federal government surveyors were specifically charged with the task of identifying navigable streams as part of their surveying duties, and the manuals and instructions

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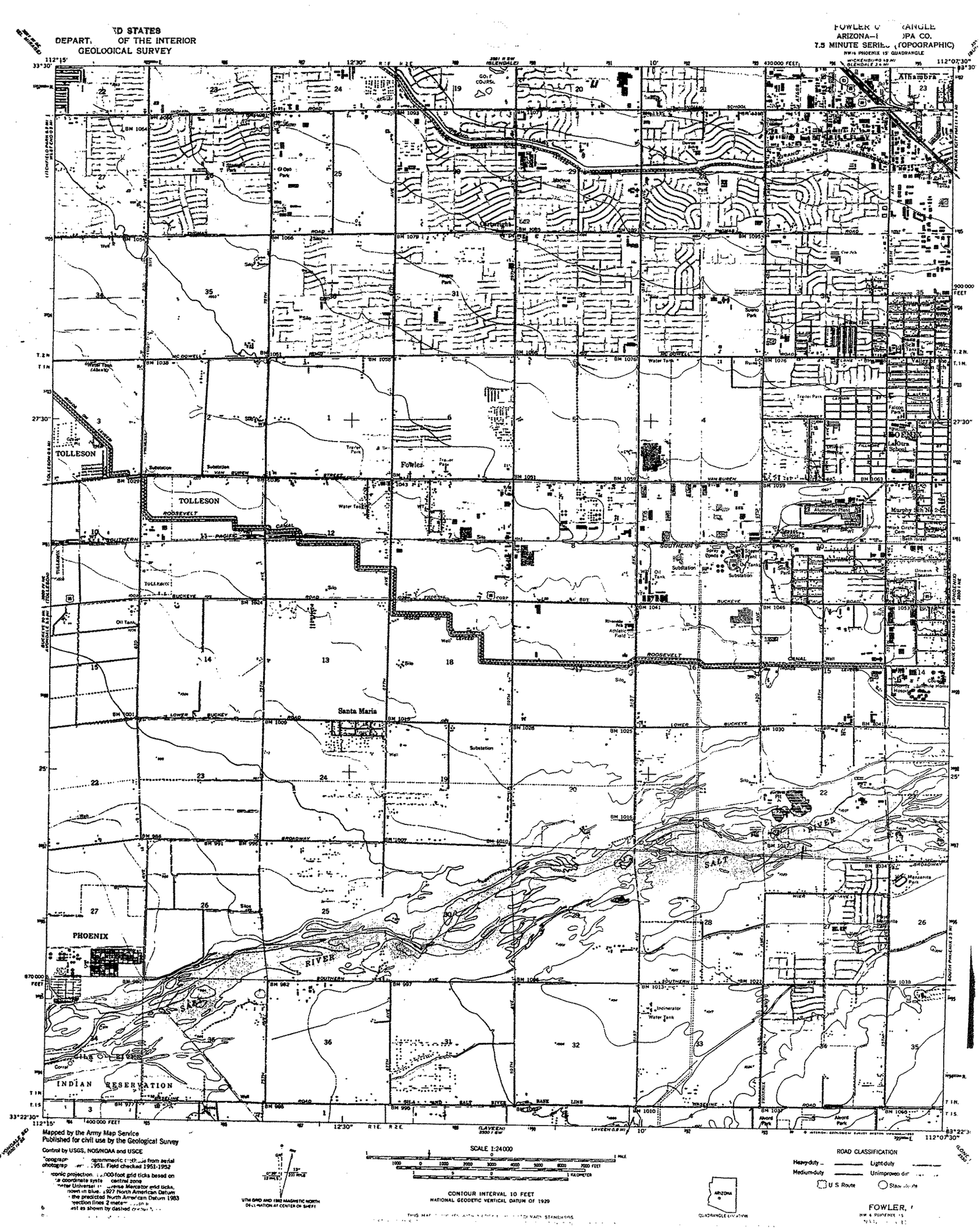
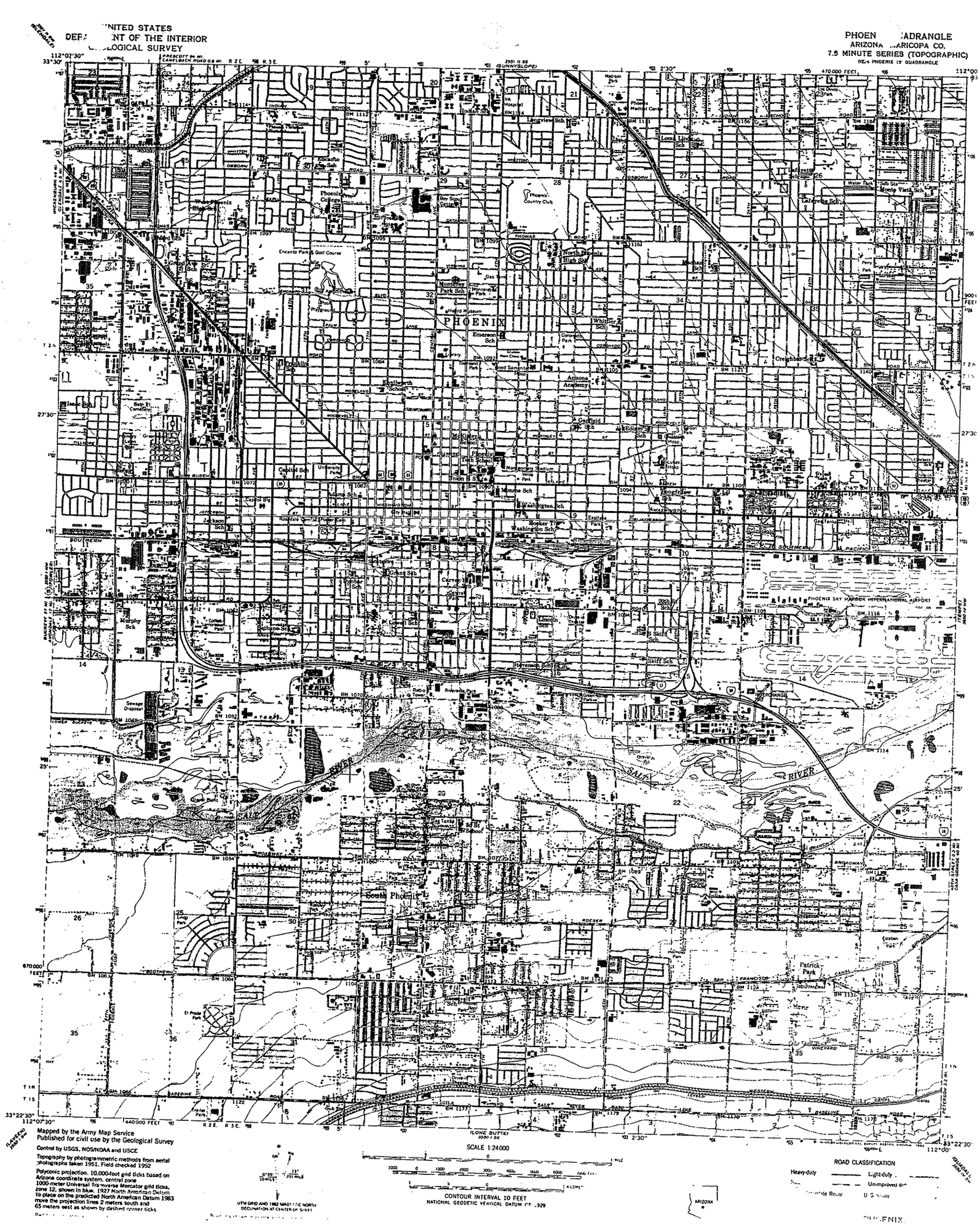
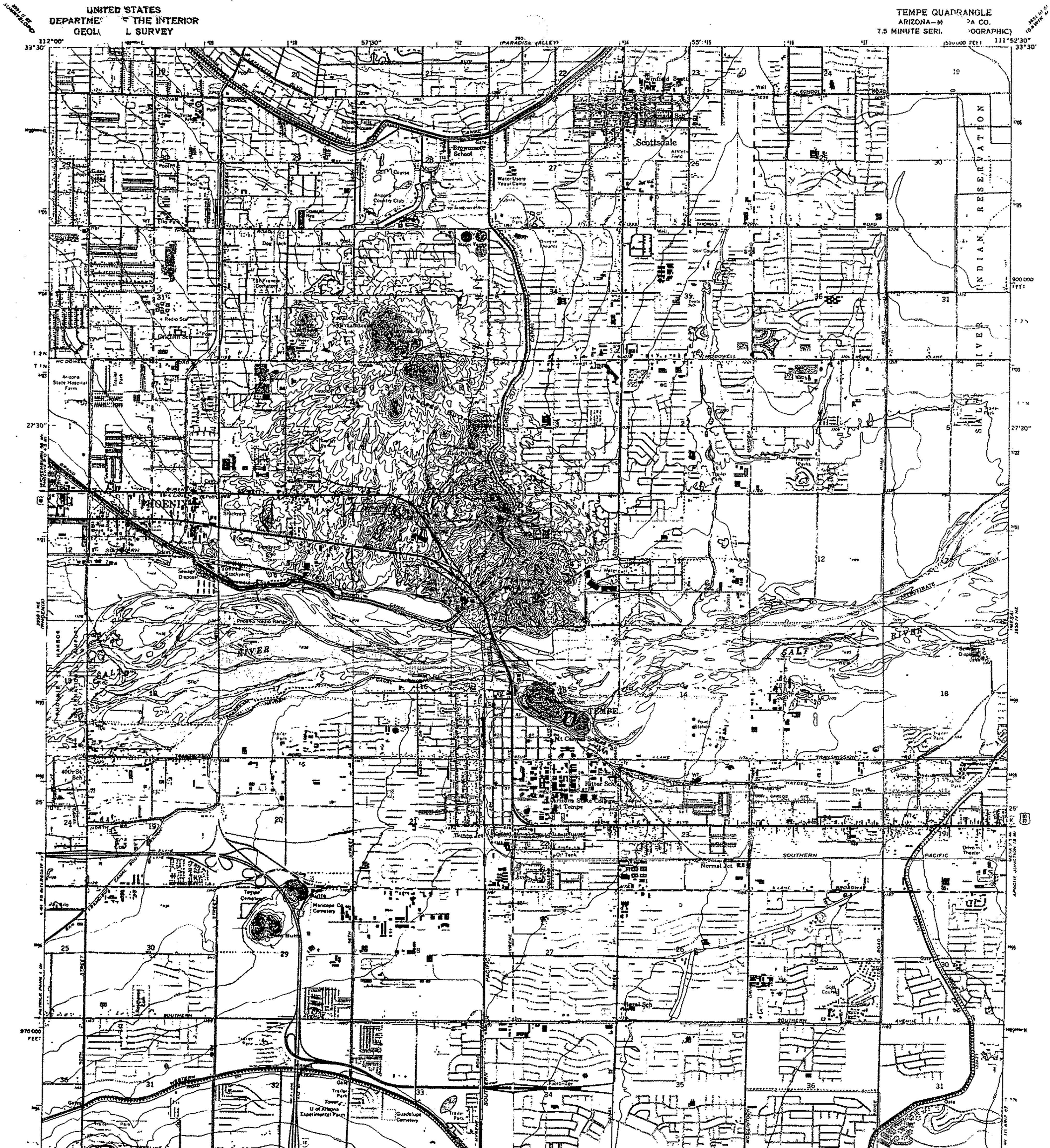
[53] H.R. Patrick, "Field Notes of the Survey of the Lines of Public Survey Closing on the North East Boundary Line of the Gila River Indian Reservation in Township 1 North, Range 1 East, Township 1 South, Ranges 1 & 2 East . . . ," Oct. 17, 1899, p. 6, 16, 29, 31, and 70 (with quotation at 6), U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 3/1].

[54] H.R. Patrick, "Field Notes of the Survey of the Lines of Public Survey Closing on the North East Boundary Line of the Gila River Indian Reservation in Township 1 North, Range 1 East, Township 1 South, Ranges 1 & 2 East . . . ," Oct. 17, 1899, quote at p. 51, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 3/1].

under which they carried out their work were very precise about how navigable bodies of water were to be distinguished from non-navigable ones. As part of the U.S. government's surveying efforts, the area along the Salt River was surveyed and resurveyed many times. Significantly, while those surveys were done at varying times of year, in different years, and by several individuals, all of the descriptions and plats that resulted from this work consistently portrayed the Salt River as being a non-navigable stream.


D STATES
DEPART. OF THE INTERIOR
GEOLOGICAL SURVEY
FOWLER QUADRANGLE
ARIZONA—MARICOPA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
TOLLESON
Fowler
Santa Maria
PHOENIX
Alhambra
SALT RIVER
INDIAN RESERVATION
ROOSEVELT CANAL
SOUTHERN PACIFIC
Mapped by the Army Map Service
Published for civil use by the Geological Survey
SCALE 1:24000
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
U S Route
FOWLER,


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
PHOENIX QUADRANGLE
ARIZONA-MARICOPA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
PHOENIX
PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
SOUTH PHOENIX
SALT RIVER
Mapped by the Army Map Service
Published for civil use by the Geological Survey
Control by USGS, NOS/NOAA and USCE
Topography by photogrammetric methods from aerial photographs taken 1951. Field checked 1952
Polyconic projection. 10,000-foot grid ticks based on Arizona coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue. 1927 North American Datum
To place on the projected North American Datum 1983 move the projection lines 2 meters south and 65 meters east as shown by dashed corner ticks
SCALE 1:24000
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Unimproved dirt
U S Route
ARIZONA
PHOENIX


UNITED STATES
DEPARTME   T THE INTERIOR
GEOL   L SURVEY
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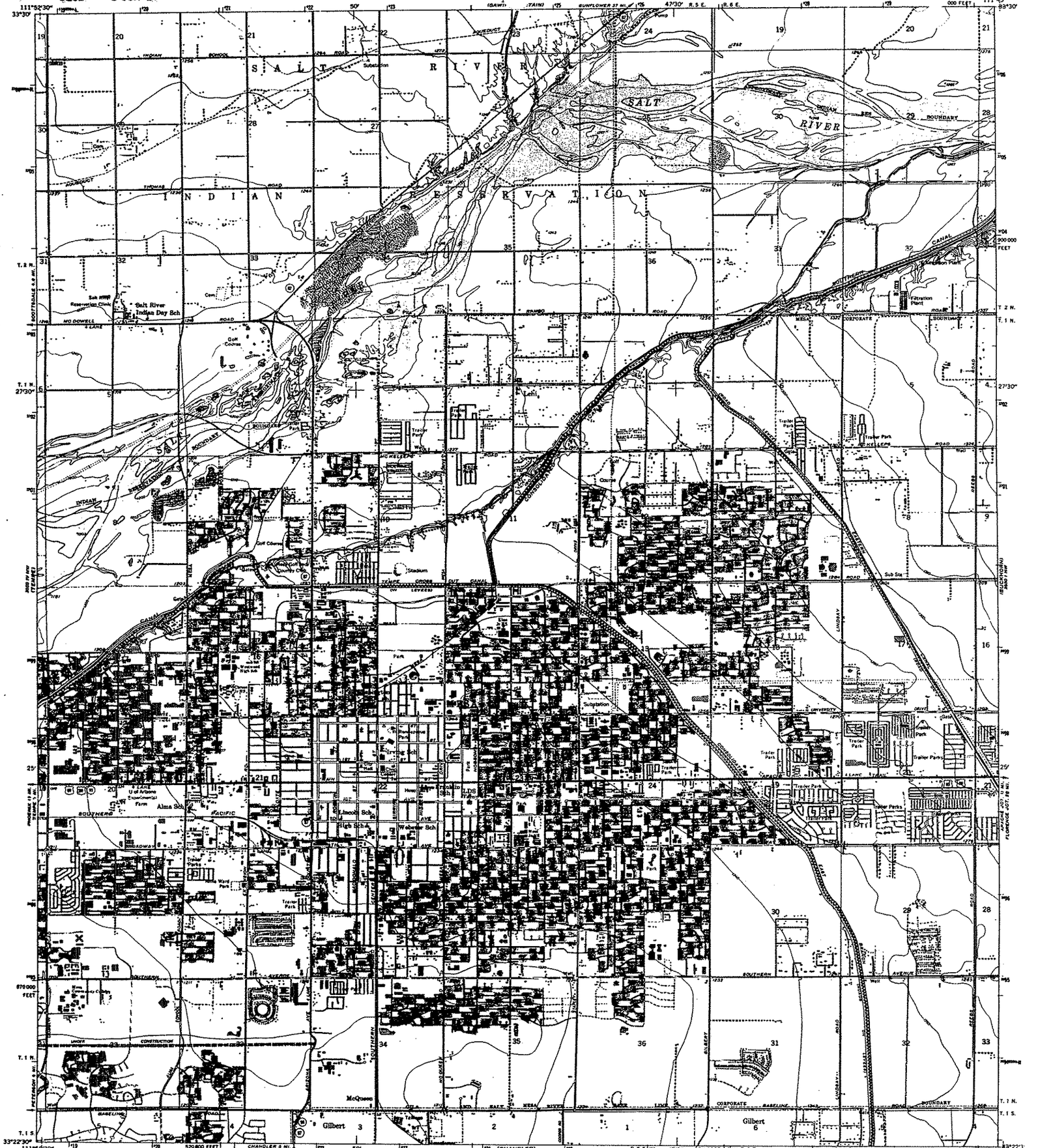
ARIZONA—M   PA CO.
7.5 MINUTE SERI   OGRAPHIC)
Scottsdale
PHOENIX
TEMPE
SALT RIVER
INDIAN RESERVATION
Mapped by the Army Map Service
Published for civil use by the Geological Survey
Control by USGS, USC&GS and USCE
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1951. Field check 1952
Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks,
zone 12, shown in blue
SCALE 1:24000
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
Interstate Route
U S Route
ARIZONA
TEMPE, ARIZ

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MESA QUADRANGLE
ARIZONA—MARICOPA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



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Published for civil use by the Geological Survey
Control by USCS, NOS/NOAA, and USCE

Topography by photogrammetric methods from aerial photographs taken 1951. Field checked 1952

Polyconic projection. 10,000-foot grid ticks based on Arizona coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue. 1927 North American Datum
To place on the predicted North American Datum 1963 move the projection lines 2 meters south and

UTM GRID AND 1962 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ARIZONA
QUADRANGLE LOCATION

ROAD CLASSIFICATION

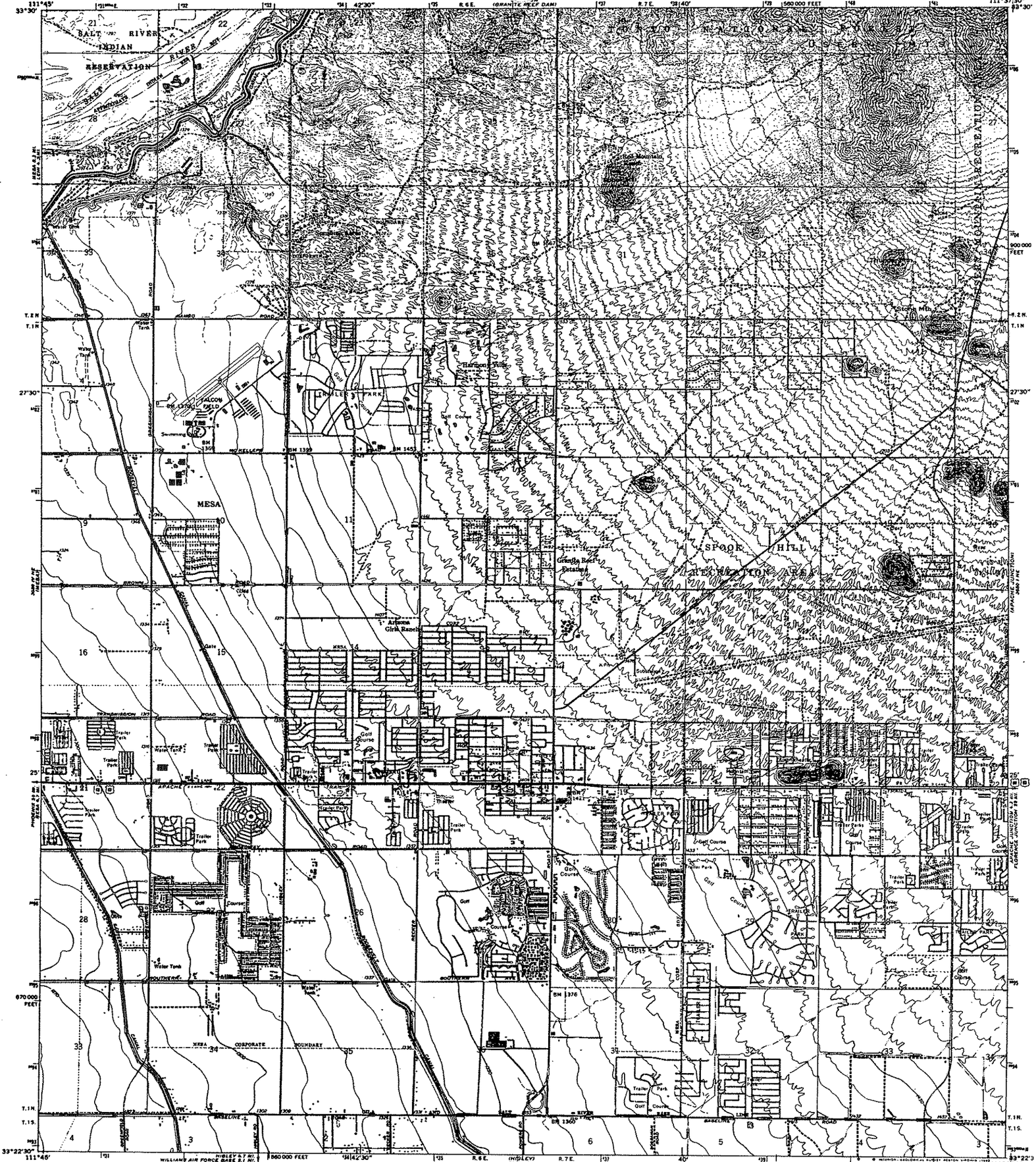
Heavy-duty ——— Light-duty - - - -
Medium-duty ——— Unimproved dirt - - - - -
U.S. Route ○ State Route

MESA, ARIZ.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

BUCKHORN QUADRANGLE
ARIZONA-MARICOPA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped by the Army Map Service
Published for civil use by the Geological Survey
Control by USGS, NOS/NOAA, and USCE

Topography by photogrammetric methods from aerial photographs taken 1955. Field checked 1956

Polyconic projection. 10,000-foot grid ticks based on Arizona coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue. 1927 North American Datum
To place on the predicted North American Datum 1983 move the projection lines 2 meters south and

UTM GRID AND 1983 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
DASHED LINES REPRESENT 5 FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

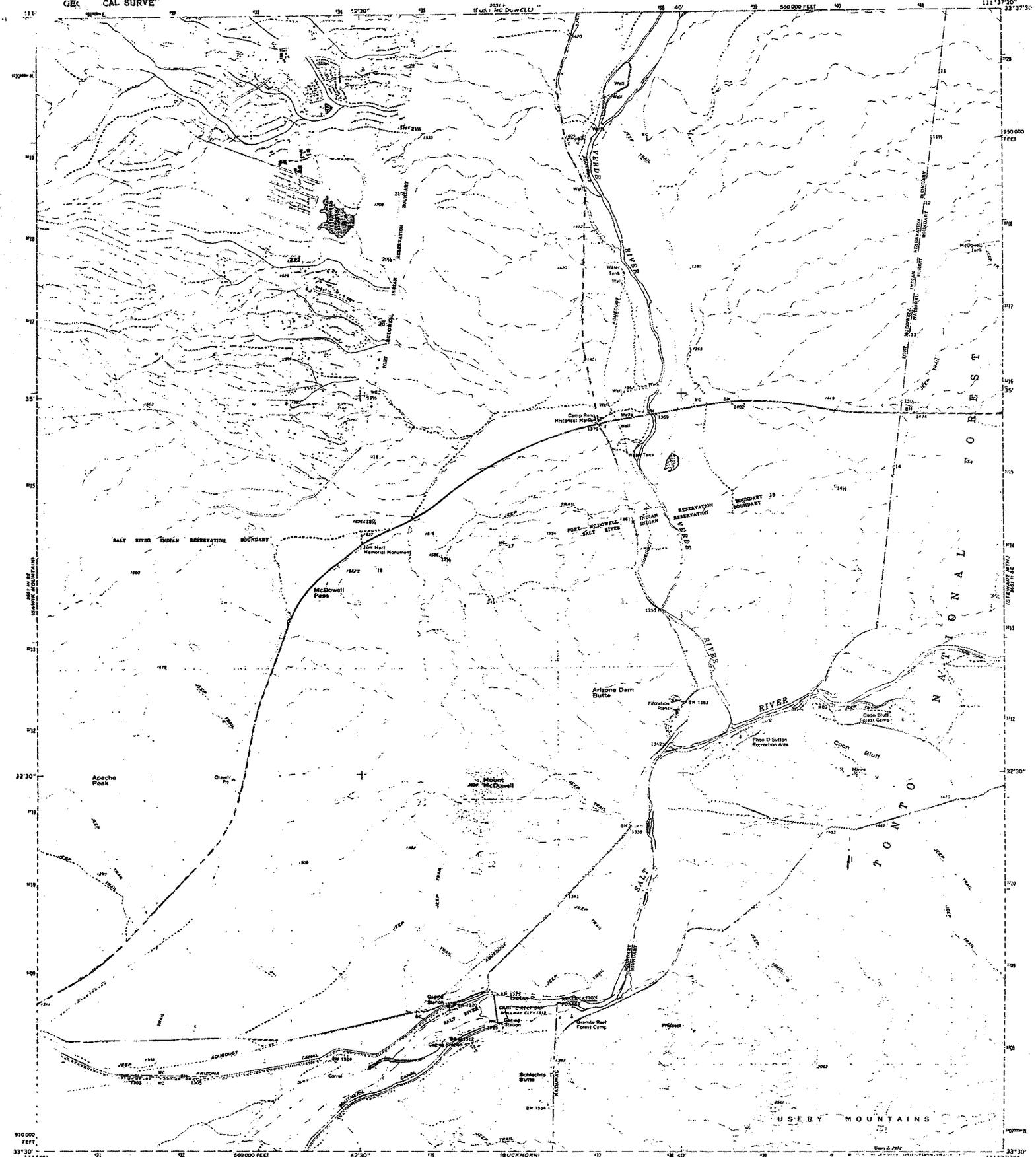
Heavy-duty ..... Light-duty .....
Medium-duty ..... Unimproved dirt .....
U.S. Route

ARIZONA

BUCKHORN, ARIZ.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GRANITE REEF DAM QUADRANGLE
ARIZONA—MARICOPA CO.
7.5 MINUTE SERIES
(TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1964

Polyconic projection. 1927 North American datum
10,000 foot grid based on Arizona coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

Where omitted, land lines have not been established

Revisions shown in purple compiled from aerial photographs taken 1974. This information not field checked

SCALE 1:24000

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10 FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Medium duty — — — Light duty
Unimproved dirt - - - - -
State Route

GRID AND 1974 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

ARIZONA
QUADRANGLE LOCATION

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092

GRANITE REEF DAM, ARIZ.
N3330—W11137.5/7.5
1974

Township No. 1 North, Range No. 1 East, Gila and Salt River Meridian

00004

Received and filed in U.S. Land Office
Prescott Arizona December 2nd 1870.
Wm. J. Ferry
Register

OFFICIALLY FILED 12-2-1870

Sec.6 615.23 | Sec.5 630.24 | Sec.4 633.72 | Sec.3 634.20 | Sec.2 635.26 | Sec.1 639.04

Sec.7 624.56 | Sec.8 640 | Sec.9 640 | Sec.10 640 | Sec.11 640 | Sec.12 640

L A N D L E V E L

Sec.18 627.40 | Sec.17 640 | Sec.16 640 | Sec.15 640 | Sec.14 640 | Sec.13 640

Sec.19 631.68 | Sec.20 640 | Sec.21 640 | Sec.22 640 | Sec.23 640 | Sec.24 640

Soil mostly 2nd rate

Sec.30 634.84 | Sec.29 640 | Sec.28 640 | Sec.27 640 | Sec.26 640 | Sec.25 640

Sec.31 634.72 | Sec.32 640 | Sec.33 640 | Sec.34 640 | Sec.35 640 | Sec.36 640

Old Channel

Gila and Salt River Meridian

Base Line

Initial Point

Aggregate Area of Public land 22,944.89 Acres

Section lines run at a Variation of 13° 36' East.

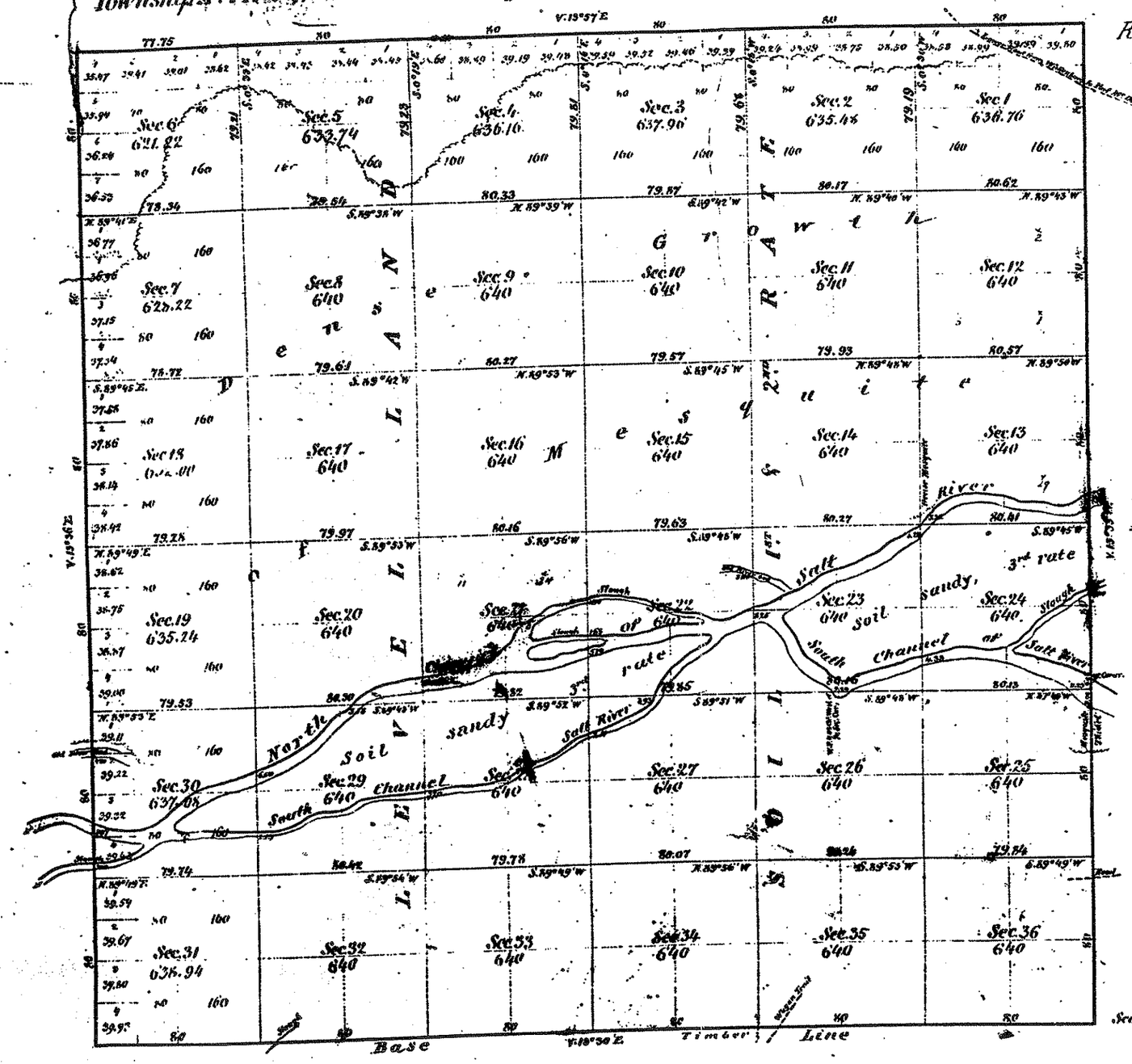
Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys	When Surveyed
West and South boundary of Township	Wm. H. Pierce	December 15th 1865		1867
East North	W. F. Ingalls	February 15th 1865	N.M.P. 77 Ch. 25 Lks	1865
Section lines	" "	" "	39. 73. 80.	March 12th 1868.

The above Map of Township No. 1 North, Range No. 1 East of Gila and Salt River Meridian is strictly conformable to the Field notes of the Surveys thereof, on file in this Office which have been examined and approved.
Surveyor General's Office,
San Francisco, California,
October 8th 1869.

59

00005

Township No. 1 North, Range No. 2 East, Gila and Salt River Meridian



Received and filed in U.S. Land Office
Prescott Arizona December 2nd 1870.
[illegible] Register

OFFICIALLY FILED 12-2-1870

Aggregate Area of Public land 22,972.80 Acres.

Section lines run with a Variation of 15°33' East.

Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys	When Surveyed.
South boundary of Township	Wm. E. Pierce	December 15th 1865		1867.
West of Township lines	W. F. Ingalls	February 18th 1868	17 M. 77 Ch. 75 Lks.	1868
Section lines	" "	" "	53 - 74 - 26 .	March 24th 1868.

The above Map of Township No. 1 North, Range No. 2 East of Gila and Salt River Meridian is strictly conformable to the field notes of the Surveys thereof on file in this Office, which have been examined and approved.

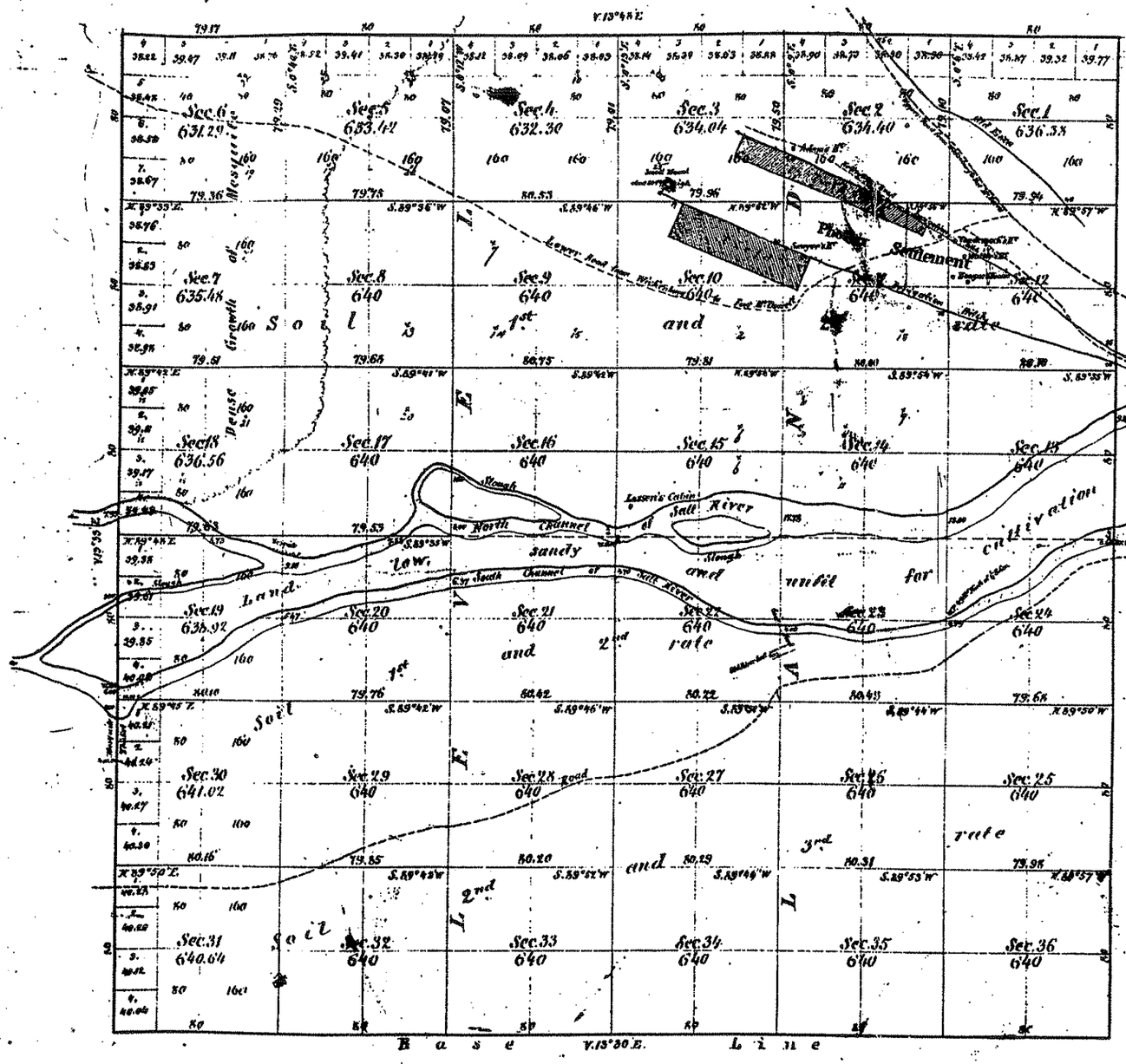
Surveyor General's Office,
San Francisco, California,
October 9th 1868.

Surveyor General.

60

Township N.º 1 North, Range N.º 3 East, Gila and Salt River Meridian

00009



Received and filed in U.S Land Office
Prescott, Arizona December 2nd 1870.
[illegible] Register.

OFFICIALLY FILED 12-2-1870

Aggregate Area of Public land 22,997.89 Acres.

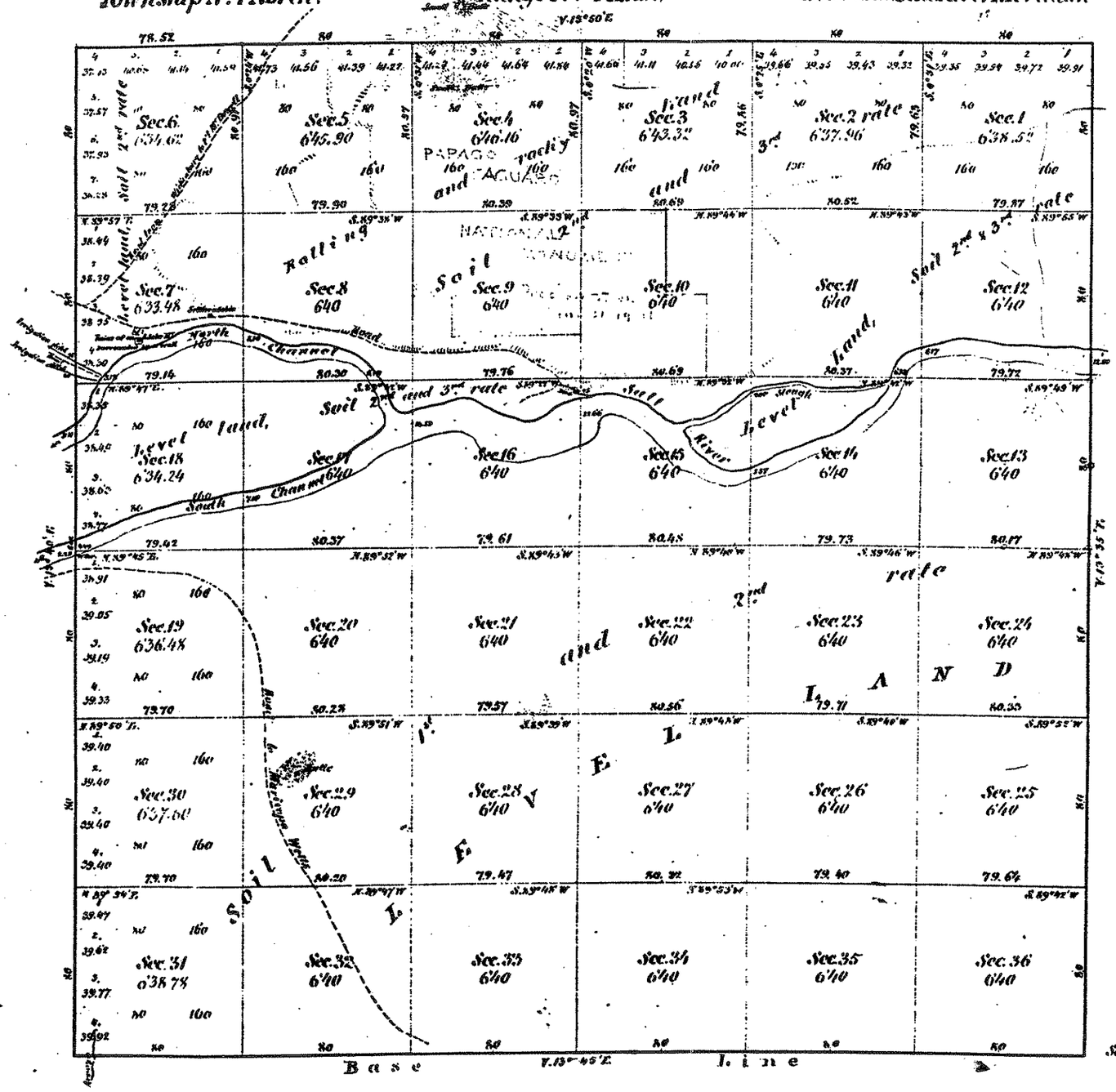
Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys	When Surveyed
South boundary of Township	Wm. E. Pierce	December 15th 1866	----	1867
Rest of Township lines	W. F. Ingalls	February 15th 1868	17 M. 79 Ch. 17 L.	1868
Section lines	" "	" "	55 - 75 . 82 .	April 4th 1868.

The above Map of Township N.º 1 North, Range N.º 3 East of Gila and Salt River Meridian is strictly conformable to the field notes of the Surveys thereof on file in this Office, which have been examined and approved.
Surveyor General's Office,
San Francisco, California,
October 15th 1868.

Sherman
Surv. Gen.

61

Township No. 1 North, Range No. 4 East, Gila and Salt River Meridian



Surveys or Descriptions	By Whom Surveyed	Date of Contracts	Amount of Surveys	When Surveyed
South boundary of Township	Wm. F. Pierce	September 15th 1866		1867.
East & Township lines	W. F. Ingalls	February 15th 1868	17 M. 75 ch. 32 l.	1868
Section lines	" " "	" " "	60 " 01 " 18 "	April 16th 1868.

00015

Received and filed in U.S Land Office
Prescott Arizona December 2nd 1870.
[illegible]
Register

OFFICIALLY FILED 12-2-1870

Aggregate Area of Public land 23,027.06 Acres.

Section lines run at a Variation of 13° 35' East.

The above Map of Township No. 1 North, Range No. 4 East of Gila and Salt River Meridian — is strictly conformable to the field notes of the Surveys thereof on file in this Office, which have been examined and approved.

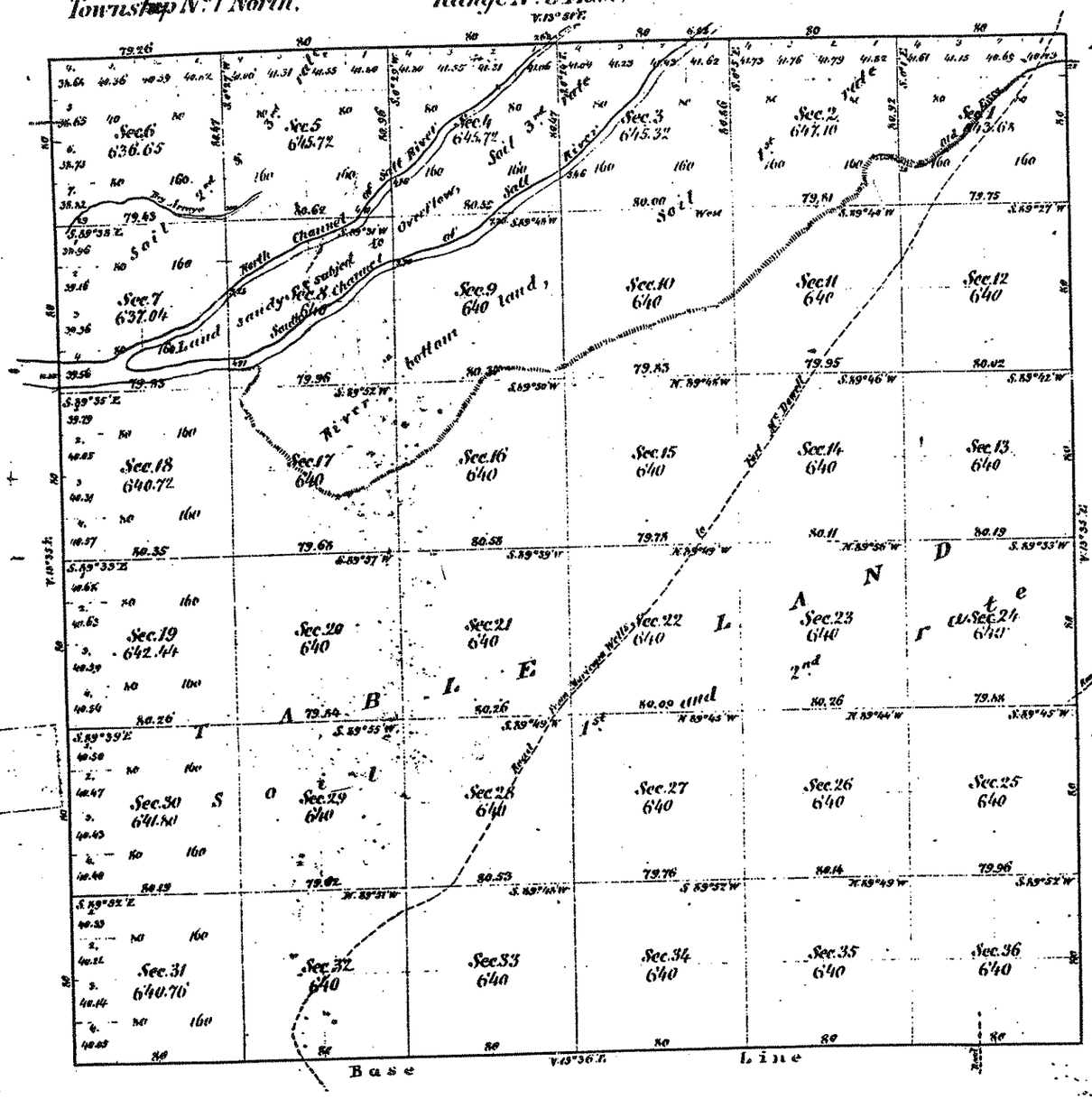
Surveyor General's Office,
San Francisco, California,
October 22nd 1868.

[signature]
Surv. Gen. Cal. & Arizona

62

·00018

Township No. 1 North, Range No. 5 East, Gila and Salt River Meridian



Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys	When Surveyed
South boundary of Township	Wm. E. Pierce	December 15th 1866		1867.
East of Township lines	W. L. Ingalls	February 18th 1868	17 M.s 79 Ch.s 26 l.s	1868
Section lines	" " "	" " "	60 . 05 . 25 .	April 29th 1868

Received and filed in U.S. Land Office
Prescott Arizona December 2nd 1870.
[illegible] Register

THE SUSPENSION OF THIS SURVEY PLAT IS HEREBY LIFTED;
AUTHORITY DIRECTOR'S MEMORANDUM DATED OCT. 30, 1979

This survey plat is hereby suspended - Authority: Secretary's Memorandum dated January 17, 1969 and Director's Memorandum dated February 20, 1969.

OFFICIALLY FILED 12-2-1870

Aggregate Area of Public land 23,066.95 Acres.

Section lines run at a Variation of 13°35' East.

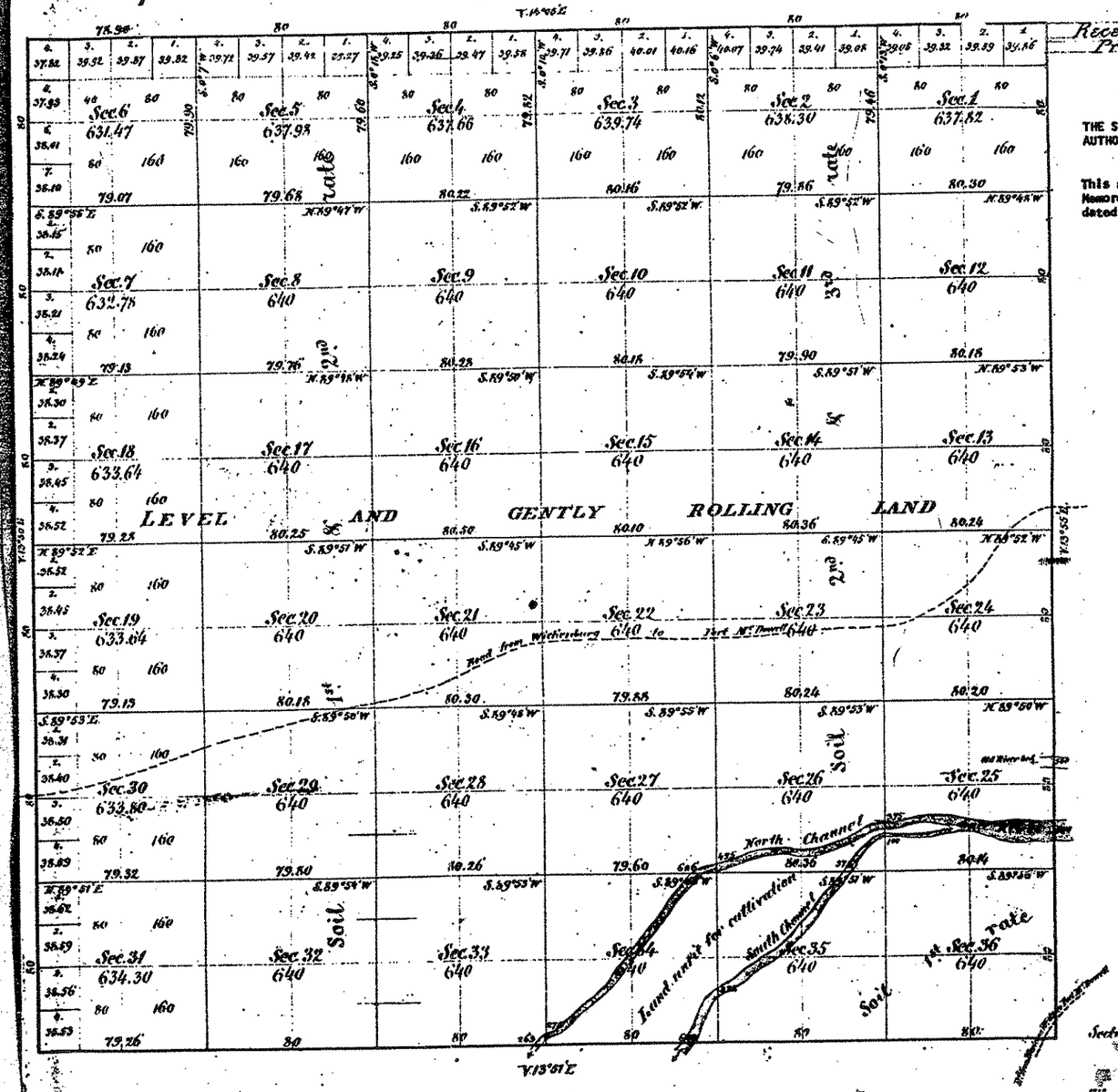
The above map of Township No. 1 North, Range No. 5 East of Gila and Salt River Meridian is strictly conformable to the field notes of the Surveys thereof on file in this Office, which have been examined and approved.
Surveyor General's Office,
San Francisco, California,
October 22nd 1868.

E. Shumway
Surv. Gen. Cal. & N.T.

63

Township N°2 North, Range N°5 East, Gila and Salt River Meridian

00091



Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys	When Surveyed
South boundary of Township	W. E. Ingalls	February 18th 1868		1868
West of Township lines	G. F. Ingalls	February 29th 1868	17 M. 76 Ch. 90 L.	1868
Section lines	" " "	" " "	59. 77. 76.	May 25th 1868

Received and filed in U.S. Land Office
Prescott Arizona December 2nd 1870.

Wm. J. Berry Register.

THE SUSPENSION OF THIS SURVEY PLAT IS HEREBY LIFTED;
AUTHORITY DIRECTOR'S MEMORANDUM DATED OCT. 30, 1979

This survey plat is hereby suspended - Authority: Secretary's Memorandum dated January 17, 1969 and Director's Memorandum dated February 20, 1969.

OFFICIALLY FILED 12-2-1870

Aggregate Area of Public land 22,991.13 Acres

Section lines run at a Variation of 13° 55' East

The above Map of Township N°2 North, Range N°5 East of Gila and Salt River Meridian is strictly conformable to the field notes of the Surveys thereof on file in this office, which have been examined and approved.

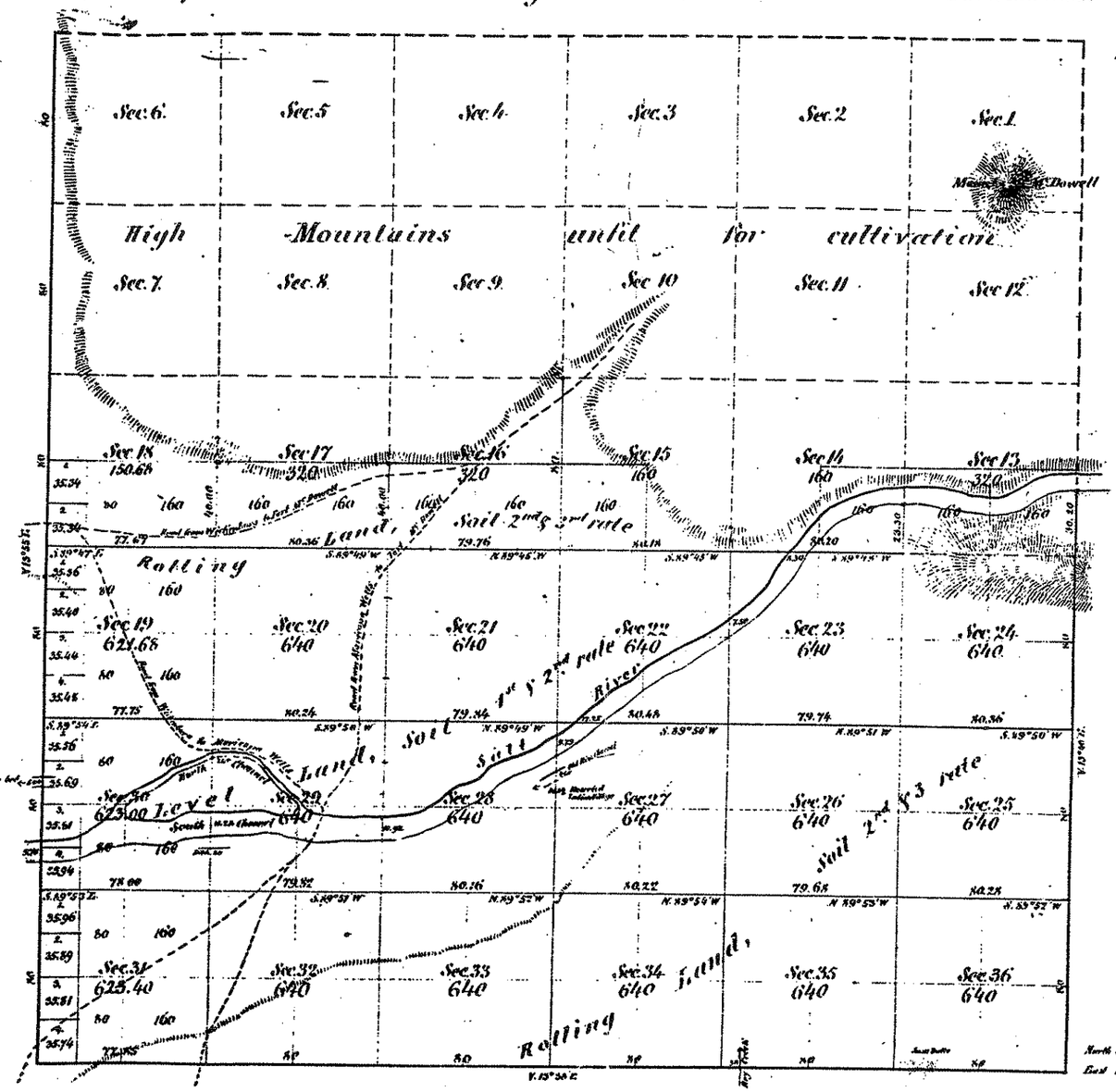
Surveyor General's Office,
San Francisco, California,
December 21st 1868

Sherman
Surv. Gen.

64

00095

Township No. 2 North, Range No. 6 East, Gila and Salt River Meridian



Surveys Designated		By Whom Surveyed	Date of Contract	Amount of Surveys	When Surveyed
Township	lines	G. F. Ingalls	February 24th 1868	15 M. 180.35 Chs.	1868
Section	lines	" " "	" " "	34 " 18 " 04 "	June 11th 1868.

Received and filed in U.S. Land Office
Prescott Arizona December 2nd 1870.
[illegible] Register

OFFICIALLY FILED 12-2-1870

Aggregate Area of Public land surveyed 13,058.76 Acres
Estimated Area of unsurveyed Mountain land 9,870.00 "
Aggregate 22,928.76 "

North and South Section lines run at a Variation of 15°40' East.
East and West Section lines run at a Variation of 15°36' East.

The above Map of Township No. 2 North, Range No. 6 East of Gila and Salt River Meridian is strictly conformable to the field notes of the Surveys thereof on file in this Office, which have been examined and approved.

Surveyor General's Office,
San Francisco, California,
December 31st 1870

Shinn Jr.
Surv. Gen. Cal. and

Township No. 1 North Range No. 5 East, Gila & Salt River Meridian

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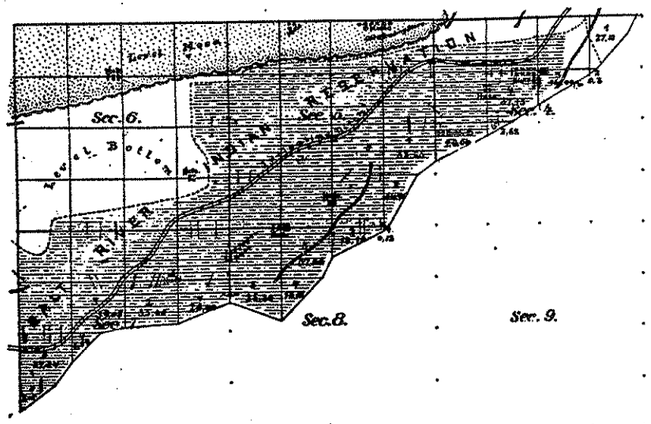
N n O o P p Q q R r S s T



Sec. 3. Sec. 2. Sec. 1. y

Sec. 4. Y

Sec. 8. Sec. 9. Sec. 10. Sec. 11. Sec. 12. x

Sec. 18. Sec. 17. Sec. 16. Sec. 15. Sec. 14. Sec. 13. X w

W

Sec. 19. Sec. 20. Sec. 21. Sec. 22. Sec. 23. Sec. 24. v

V

Sec. 30. Sec. 29. Sec. 28. Sec. 27. Sec. 26. Sec. 25. u

U

Sec. 31. Sec. 32. Sec. 33. Sec. 34. Sec. 35. Sec. 36. t

OFFICIALLY FILED

Scale 40 Chains to an Inch.

Total number of Acres 1994.75

Surveys Designated.	By Whom Surveyed.	Date of Contract	Amount of Surveys M. Chs. Lks.	When Surveyed.	Value.
Township lines	L.D. Chillson	Nov. 6 1877	4 69 25	Mar. 9 to 21 1881	13.12
Subdivisions	do	do	14 5 2	Mar. 22 to 26 1881	13.09
Meander lines.	do	do	3 84 50	Mar. 22 1881	13.08

Meanders of right Bank of Salt River.
Begin at Post 65

Posts	Courses	Chains	Posts	Courses	Chains
No 66	S 34° W	3.90			
67	S 37½ W	7.20			
68	S. 45½ W	16.60			
69	S 56½ W	5.61			
70	S 58½ W	23.08			
71	S. 67½ W	11.22			
72	S. 64° W	14.94			
73	S. 63½ W	22.28			
74	S 54½ W	18.59			
75	S 29½ W	22.95			
76	S. 48½ W	2.26			
77	S. 63½ W	22.32			
78	S. 49½ W	30.90			
79	N. 70° W	21.28			
80	S. 66½ W	24.51			
81	S. 82½ W	20.03			
82	S. 72½ W	9.91			
83	S. 44½ W	5.69			
84	S. 36½ W	11.13			
85	S. 51½ W	17.12			

The above Map of Township No. 1 North, of Range No. 5 East, Gila & Salt River Meridian, Arizona, is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved.

Surveyor Generals Office
The 10th 1881.

John Wise
Surv. Genl

66

CHAPTER 2: LAND PATENTS AND STATE GRANTS

The U.S. Congress passed a variety of homestead laws in the middle-to-late nineteenth century designed to facilitate the settlement of newly acquired lands in the West. The laws resulted in thousands of federal patents being issued to eager settlers determined to establish homes and farms in the West's unfamiliar climate. Before discussing federal land patents in relation to the Salt River, a few words need to be said about the stream's location as portrayed on various maps since this has bearing on related patent positions.

U.S. GEOLOGICAL SURVEY HISTORICAL TOPOGRAPHIC SURVEY MAPS OF THE SALT RIVER REGION: The U.S. Geological Survey began mapping the area surrounding the lower Salt River prior to Arizona's admission to the Union in 1912. These were not the first maps to be made of the region, however. As noted in Chapter One, the U.S. General Land Office had conducted original surveys in the valley in 1868 to facilitate homesteading and to create accurate legal descriptions of property. Subsequent mapping by the U.S. Geological Survey for the lower Salt River valley took place between 1904 and 1913 and resulted in five topographic maps: "Camelback, Arizona, 1904" (see page 115), "Desert Well, Arizona, 1904" (see page 116), "Ft. McDowell, Arizona, 1904" (see page 117), "Mesa, Arizona, 1913" (see page 118), and "Phoenix, Arizona, 1912" (see page 119).

In comparing the original survey plats completed by the U.S. General Land Office in 1868 and the first U.S. Geological Survey

topographic maps of 1904-1913, it is clear that the Salt River underwent major shifts in its course during the late nineteenth century. The later maps done by the U.S. Geological Survey in 1904-1913 show the river had changed course considerably since the surveys done by the U.S. General Land Office. For example, the U.S. Geological Survey's original 1912 "Phoenix, Arizona" topographic map shows the Salt River running in a course south of where the river was on the 1868 U.S. General Land Office survey plats. The historical 1904-1913 topographic maps also show the river having fewer channels in places than it had in the late 1860s. Because of these shifts in the Salt River's position, homestead patents discussed below have been placed on maps showing the streams position in 1868 and in 1904-1913. (See Exhibits 1-4 folded inside the front pocket of this report.)

BACKGROUND INFORMATION ON HOMESTEADING AND FEDERAL LAND PATENTS: With U.S. General Land Office surveys having provided an orderly system for the federal government to dispose of the public domain in the Territory of Arizona, settlers began to acquire parcels of land through homesteading. The various homestead laws passed by U.S. Congress in the late nineteenth century[55] generally required a settler to file an application and make a small payment for a given parcel of land with the nearby federal land office. The application would describe the land by township, range, and section, and within each six-hundred-forty-acre section by a

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[55] The most important of these laws was "An Act of Secure Homesteads to Actual Settlers on the Public Domain," 37th Cong., 2nd Sess., ch. 75 (1862).

fractional identification. For example, a typical one-hundred-sixty-acre parcel might be described as the northeast quarter of section 7, township 1 north, range 5 east, Gila and Salt River Meridian. A forty-acre parcel might be the northwest quarter of the southeast quarter, etc., and a twenty-acre parcel might be the west half of the southwest quarter of the southwest quarter, etc.

Once the application was filed, the settler was required to live on the land for a number of years and make certain improvements. When the necessary time had elapsed, he could return to the land office with witnesses to file affidavits stating he had complied with the homesteading requirements. There, he would also complete any remaining paperwork. The affidavits and paperwork created a patent file that contains a great deal of information about the settler and the land he wanted to acquire. The affidavits typically describe the parcel in question, the number of acres, the crops farmed, the improvements made, as well as other pertinent information. Depending on the parcel, the type of patent, and whether there was any controversy involved, the patent file might also contain other information such as court documents. If the land office approved the affidavits, the settler would pay an additional small fee, and he would be rewarded with the patent (legal title) to his parcel. Even if the settler never fulfilled the requirements to obtain title to the land, however, a patent file would still have been created describing the land sought, although the patent would be carried on federal government books as having been relinquished or canceled.

In relation to the lower Salt River, there are over 225 patent applications that were filed in sections overlapping the stream between the western boundary of township 1 north, range 1 east (the Salt River's confluence with the Gila River) and the eastern edge of township 2 north, range 6 east (near the location of Granite Reef Dam). These patents can be located on the U.S. Bureau of Land Management's Master Title Plats and Historical Indexes (see pages 120 and 121 for examples of these documents), which are cartographic records of how the U.S. government has disposed of (or otherwise compromised) the public domain. The Master Title Plats and Historical Indexes also show grants made to private individuals, corporations, and to the State of Arizona.

The three sets of records discussed above (U.S. Geological Survey historical maps of 1904-1913, U.S. General Land Office original 1868 survey plats, and General Land Office Master Title Plats/Historical Indexes) were used to create Exhibits 1-5, which are located in the front and back pockets of this report. The U.S. Geological Survey historical topographic maps and the U.S. General Land Office survey plats were digitized and overlaid by Salt River Project Cartographics using a GIS computer system. With this product, the U.S. General Land Office Master Title Plats and Historical Indexes were consulted to place the federal patents upon the newly created map and produce Exhibits 1-4. (For Exhibit 5, which shows state patents, the same process was used, substituting state plats created by the Arizona State Land Department for the Master Title Plats -- see page 107 for discussion.)

Significance of Patents to Salt River's Potential Navigability: Federal patents to private parties and the supporting files (federal grants made to the State of Arizona will be discussed later) are important for several reasons in ascertaining the potential navigability of the Salt River around the time of statehood.[56] First, the patents indicate the total amount of land awarded by the United States. If the Salt River flowed through the parcel and was navigable, federal officials would not have granted the title of the bed of the stream since the State of Arizona would own it due to the state's sovereignty, and as a result, a patent to a quarter section would have been recorded as somewhat less than one-hundred-sixty acres (a full section is six-hundred-forty acres). Moreover, if the river had been considered navigable, an irregularly-shaped parcel next to the river would have been identified as a "government lot" instead of as an even division of a six-hundred-forty-acre section. In other words, a patent to a small parcel of land lying next to a navigable body of water would have a reference to, hypothetically, "government lot 3, consisting of 27.4 acres."[57]

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[56] Copies of patents for this report were obtained from the U.S. Bureau of Land Management in Phoenix. Patent files were obtained from the National Archives in Washington, D.C.

[57] For details on how federal surveyors were to handle creating government lots next to navigable bodies of water, see Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations (Washington, D.C.: Gideon and Co., 1851), reprinted in C. Albert White, A History of the Rectangular Survey System (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 434, 436-437. See also for examples of how government lots were established, Instructions to Deputy Surveyors of the United States

(continued...)

Importantly, none of the federal patents that overlay the Salt River (regardless of their respective dates) contain any provisions for reserving the bed of the river to the State of Arizona. There is also no evidence that Arizona, upon statehood, chose lands in lieu of those patented upon the river bed -- which it would have been entitled to do had the river been navigable. (In-lieu, or indemnity, selections were public domain lands chosen by a state to compensate for overlapping claims to state ownership elsewhere.) Similarly, there are no government lots listed in patents adjacent to the Salt River, except parcels lying on the north or west boundaries of individual townships (where acreage was adjusted for the curvature of the earth) or parcels lying adjacent to the bed of the river near the Salt and Gila River Indian reservations.

Another reason why patents are important to help determine whether the Salt River was navigable at the time of statehood relates to their supporting files. Since a settler had to sign an affidavit regarding improvements and similar documents had to be secured from eyewitnesses, a patent file not only reiterates acreage being assigned, but it also can convey details such as whether the farmer built an irrigation ditch from the Salt River or whether he used the river for other purposes. Again, nothing in the supporting files suggests that the Salt River was navigable.

FEDERAL PATENTS TO PRIVATE PARTIES IN THE STUDY AREA: This report will discuss first all federal patents to private

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[57](...continued)
for the District of Illinois and Missouri (St. Louis: N.p., 1856), reprinted in ibid., pp. 425, 430.

individuals made in the primary study area (section thirty-one of township 1 north, range 1 east, upstream to section thirteen of township 2 north, range 6 east). Due to the large area of land encompassed in the study area, this report will discuss examples of that are characteristic of others in each township. In all cases, patents will be reviewed going upstream. A later section of this chapter will deal with federal grants to the State of Arizona (see page 104 above).

Federal Patents in the Study Area on the Salt River in Township 1 North, Range 1 East: Lying close to the confluence with the Gila River in section thirty-two of township 1 north, range 1 east, is the land encompassed in homestead patent 265. (For map reference to all patents discussed in this township see Exhibit 1 folded in the inside front pocket of this report.) Deeded to William F. Fickas on November 9, 1891, the federal government sold the northeast quarter of this section (one-hundred-sixty acres) in its entirety. According to the historical 1904-1913 U.S. Geological Survey topographic maps as well as the 1868 U.S. General Land Office plats, the river and its bed lie in the southeastern area of this parcel of land. Yet the government granted title to this complete quarter section. No lands were withheld from Fickas because of the river bed's location in the parcel.[58]

Slightly upstream from Fickas's land and just north of the Gila River Indian Reservation in section thirty-four lies land

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[58] Homestead Patent No. 265, Nov. 9, 1891, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/1].

patented to Eliza C. Ambrose in 1894. Her parcel contained the land in the northwest quarter of this section, and the federal government deeded the full one-hundred-sixty acres to her in homestead patent 602. According to the 1904-1913 U.S. Geological survey quadrangles as well as the 1868 U.S. General Land Office survey plats, the Salt River ran directly through this parcel of land, with its bed in over half the patented portion. Yet the U.S. government made no attempts to withdraw any of this land for Arizona.[59]

Moving upstream in township 1 north, range 1 east, the northeast quarter of the southeast quarter of section twenty-five was purchased in 1919 as homestead patent 704051 by Ira Jasper Richards. Again according to the historical U.S. Geological Survey topographic maps as well as the U.S. General Land Office survey plats, the river runs directly through this land. Inasmuch as Arizona had attained statehood in 1912 -- seven years before Richards's patent was issued -- it is significant that the state made no objections to Richards's patent based on a claim of navigability of the Salt River.

While the patent itself is revealing about the nature of the Salt River, so too is Richards's patent file. The tract of land Richards wanted consisted of forty acres. For acres cultivable, Richards listed "about 25" in his affidavit for final proof, and he then made a notation that the remainder was "bottom land, river

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[59] Homestead Patent No. 602, March 15, 1894, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/1].

bed." Final proofs were also required by two witnesses and were kept in the patent file. Nathaniel Waldo Haggard's affidavit listed only fifteen acres of this tract as cultivable and claimed the remaining balance lay "in river bed." John H. Ivy's proof closely paralleled the first two. It was clear from all this documentation that Richards's patent contained land in the bed of the river. Yet the file created for his patent held nothing to suggest any attempt was made to remove acreage from this parcel due to Arizona's sovereignty. The patent was granted to Richards for the full forty acres.[60]

Patent 444070, issued to Manuel V. Gonzales in 1914, contained land in the south half of the southeast quarter of section twenty-five, directly south of Richards's land. According to the 1904-1913 U.S. Geological Survey topographic maps as well as the 1868 U.S. General Land Office survey plats, the river and its bed lay also directly on this parcel of land. Additionally, proofs given by Gonzales's witnesses in his patent file record the river's presence on the land. For example, Arturo Zuniga wrote that "about eighty acres can be cultivated, **balance in river.**" (Emphasis added.) A further indication of the federal government's knowledge of the river's presence was the parcel's initial withdrawal from settlement for use by the Salt River Project. The land was restored on November 7, 1912, to the public domain almost nine

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[60] Homestead Patent No. 704051, Aug. 29, 1919, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/1]; Homestead Patent file for Entry 704051, Aug. 29, 1919, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/13].

months after statehood. If the land had been Arizona's due to the navigability of the Salt River, the state made no such claim then or when Gonzales patented it. Instead, the federal government issued the patent to Gonzales in November 1914 for the full eighty acres. There is no indication in the patent itself or in its supporting file that any exception was made for withholding the bed of the Salt River due to a possible claim of ownership by the State of Arizona.[61]

Federal Patents in the Study Area on the Salt River in Township 1 North, Range 2 East: Moving upriver into township 1 north, range 2 east (all patents for this section can be found on Exhibits 1-2, which are folded in the inside front pocket of this report), Robert E. Jameson applied in 1951 for the south half of the southeast quarter of the northeast quarter of section twenty-nine. He was granted twenty acres through private exchange patent 1131653. In this type of transaction, the U.S. Bureau of Land Management was required to file a Land Classification Report. A copy of the report, completed by a field examiner, was included in the patent file and described the topography of the parcel as "[f]lat on side channel of Salt River." The examiner also noted that the land was "[f]looded by Salt River" when he recorded the type and extent of erosion. In recording his findings and recommendations, the examiner also made the point that

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[61] Homestead Patent No. 444070, Nov. 21, 1914, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/1]; Patent file for Homestead Entry 444070, Nov. 21, 1914, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/14].

> [t]he Bureau of Reclamation wants the offered lands so that their lands will join and not have a 1/4 mile gap between, and so that channelizing the river for flood protection can be done without acquiring right-of-way.

Under the same section, it was also noted that the Bureau of Reclamation had been using gravel from the area for construction purposes. Though the land clearly lay in the bed of the river according to the historical U.S. Geological Survey topographic maps, the original U.S. General Land Office survey plats, and documentation in the patent file, there was no indication in either the patent or its supporting file that the federal government withheld any lands in this parcel due to Arizona's sovereign rights to the bed and banks of any navigable body of water.[62]

Just north of Jameson's land and still in the bed of the Salt River lies the parcel of land patented by John E. Clem, who filed for the south half of the southeast quarter of section twenty in township 1 north, range 2 east. He was granted title to the full eighty acres in 1917. According to the historical 1904-1913 U.S. Geological Survey's topographic maps and the original 1868 U.S. General Land Office survey plats, Clem's land lay directly in the Salt River's bed. Furthermore, the presence of the river itself is documented by the patent file. In the file, three separate proofs described the land Clem was applying to purchase. In Clem's own proof, he described the subdivision as

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[62] Private Exchange Patent No. 1131653, April 13, 1951, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/3]; Patent file for Private Exchange Entry 1131653, April 13, 1951, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/16].

> [o]rdinary river bottom land. All can be cultivated **except 20 acres which is cut by ditches and river.** [Emphasis added.]

Horace A. Mitchell noted similar things about the land, and was even more specific:

> It is river bottom land, and half of it can be cultivated. **The river runs through one side of it.** No timber except scrub timber along river. [Emphasis added.]

The last witness, Albert E. Manley, simply stated that the tract of land was "[r]iver bottom land, about 50 acres tillable." When describing the improvements the applicant had made, Manley also stated that the "land is fenced 3 sides, river & canal on other side."

Despite these numerous and obvious descriptions of the land actually lying in the river bed, the federal government nonetheless chose to patent the entire tract to the applicant instead of removing a certain portion of the acreage (at least twenty acres according to the most conservative estimate) based on the state's sovereign ownership of the bed and the banks of any navigable river. There is no indication in either the patent or its file that the federal government attempted to remove any acreage.[63]

Continuing upstream, Charles Edwin Kirkpatrick filed an application for land located in section twenty-four of this same township. The land, according to the historical U.S. Geological

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[63] Homestead Patent No. 567440, Feb. 14, 1917, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/3]; Patent file for Homestead Entry 567440, Feb. 14, 1917, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/18].

Survey topographic maps and the original U.S. General Land Office survey plats, lay directly in the bed of the Salt River. Underscoring the presence of the river is the documentation found in the patent file created during the homesteading process. A question on the final proof Kirkpatrick filed inquired whether he had left the land for any length of time since first establishing residence. Kirkpatrick noted that his entire family was on their "[r]egular 5 month leave of absence," from October 1, 1915, to May 1, 1916, but that "[o]n account of high water it was impossible to go back at the expiration of that time." Two of the three witnesses filing testimony on behalf of Kirkpatrick (Oscar F. Alexander and Delbert H. Thornton) also noted that the family left the land during winter due to high water. The Kirkpatrick family's extended absences forced Kirkpatrick to apply for an exception to the homestead law's requirement for permanent residence on the land. On his "Application for Leave of Absence," Kirkpatrick explained the reason for his request (original spellings have been retained):

> The said **claim consists of a part of two Islands in Salt River** and high water has caused the road to the homestead to be in very bad condition and on this acct. and on acct of the Rosevelt Resevoir being full of water makes it very unsafe for a family consisting of a wife and 4 small children to be left alone **on the island** in Feb, March & April with the reservoir full & running over **it is possibly for the water to cover the island** in case of heavy rains in the mountains, **as the water covered a part of 1 island** during the flood about Jan. 15-16 of this year destroying 2 or more acres of my barley[.] I have to work in Phoenix to make a living for family so can only be at home nights and sundays. [Emphases added.]

It is clear from Kirkpatrick's description that this particular tract lay directly in the river bed. Other documents in the file indicated likewise. However, despite this knowledge, the U.S. General Land Office patented the land to Kirkpatrick as homestead entry 607405 without removing any acreage due to navigability.[64]

Federal Patents in the Study Area on the Salt River in Township 1 North, Range 3 East: Going upstream to the next example, James Littleton filed for homestead entry 588981 in township 1 north, range 3 east, in November 1913. (For map references to all patents in this township see Exhibits 2-3 folded in the inside front pocket of this report.) Littleton's application was for the northwest quarter of section nineteen (just west of present-day Phoenix). According to the historical U.S. Geological Survey topographic maps as well as the original U.S. General Land Office survey plats, the river and its bed encompass the entire parcel. Yet there is no indication in either the patent or its corresponding file that the federal government withheld any acreage for the bed and the banks of the river due to sovereign ownership by the State of Arizona.

Littleton's thick patent file provides many indications that the land he wanted was located in the bed of the Salt River. On his own final proof, the form required him to list any absences

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[64] Homestead Patent No. 607405, Nov. 12, 1917, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/3]; Patent file for Homestead Entry 607405, Nov. 12, 1917, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/17].

from the land. Littleton wrote that there was "[o]ne absence from the 17th January to 8th of April last year because of the high water." George Washington Pike and Delbert H. Thornton, witnesses for Littleton, both re-iterated the absence from the land due to high water. The presence of high water upon the land illustrates that the parcel lay in the bed of the Salt River. The patent was finally issued to Littleton in 1917 for one-hundred-sixty acres. Yet when deeding out the parcel, no land was withheld due to Arizona's sovereign right to the bed and the banks of navigable streams.[65]

Directly to the east of Littleton's land lay the northeast quarter of section nineteen. This parcel was patented to George W. Pike as homestead entry 442935. Like Littleton's land, Pike's entire parcel lay directly in the river's bed. In the patent file for this tract of land, there were many proof documents filed by the applicant and his witnesses describing the land and the improvements made upon it. These documents support the conclusion that the Salt River ran directly through the land. One witness, Thomas Rain, wrote that in 1910 Pike had "cleared on south side of the river about 20 acres." Rain also recorded that Pike had spent time "filling up deep slues [sic]." More telling, however, was Pike's own description of the land:

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[65] Homestead Patent No. 588981, June 22, 1917, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/4]; Patent file for Homestead Entry 588981, June 22, 1917, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/27].

> **The claim is located partly in the river bed of the Salt River.** The portion not cultivable is covered with brush and small trees. The small trees can be cut for fire wood and for fence posts. [Emphasis added.]

In response to the question of whether Pike had joined the Salt River Valley Water Users' Association, Pike wrote that he had not done so because "my land is located in the river."[66]

Though the patent was eventually granted, Pike's case was a difficult one. The homestead laws were intended to increase settlement of the West as well as perpetuate the agriculturally-based history of the United States, and therefore, settlers under such laws were required to demonstrate use of the land for farming as opposed to mining, land speculation, etc. In Pike's case, his land was contested by fellow homesteader, Samuel Mahan, as not being suitable for cultivation as required under the 1862 Homestead Act. On the "Affidavit to be Filed Before Contest," Mahan swore that the

> tract is chiefly valuable for Gravel and Sand, also that Gold can be panned therein, and that part of said land or tract is claimed for Placer Mining purposes, and Sand and Gravel have been mined and hauled there from for a long time, [t]hat the tract is not subject to Homestead Entry, and is practically impossible to successfully be farmed for crop.

Although this claim was rejected, it nonetheless demonstrated certain characteristics about the parcel in question, strongly suggesting it lay in the river bed. Yet despite the obvious

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[66] Homestead Patent No. 442935, Nov. 16, 1914, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/4]; Homestead Patent file for Entry 442935, Nov. 16, 1914, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/20].

knowledge that the land was located in the river bed, the federal government, when granting title, did not withhold any acreage for Arizona due to the stream's navigability. The full eighty acres were granted to Pike in 1914.[67]

Not far east from Pike's land is the northeast quarter of the northwest quarter of section twenty, the lands contained in Samuel Mahan's patent 495328. As shown by the 1904-1913 U.S. Geological Survey topographic maps as well as the 1868 U.S. General Land Office survey plats, the Salt River flowed directly through Mahan's land. Mahan, the contestant in Pike's case, applied for a cash entry to this tract, completed the necessary procedures, and was eventually granted title to the forty-acre parcel in 1915. But Mahan's case, like Pike's, was littered with difficulties -- some of which shed light on the nature of the Salt River. Ironically, what Mahan had contested about Pike's land was also disputed on his own. Mahan filed his application in May 1913. On August 15, 1914, according to documentation in the patent file, a protest was lodged by the attorneys for Clinton Lauver and D.G. Beals against Mahan's application on the grounds that the land was already embraced in two placer mineral filings made on sand and gravel deposits in the bed of the Salt River. Documentation of the conflict found in Mahan's patent file underscores the river's presence as well as

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[67] Homestead Patent No. 442935, Nov. 16, 1914, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/4]; Homestead Patent file for Entry 442935, Nov. 16, 1914, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/20].

gives excellent descriptions indicating the character of the Salt River at that location.

A brief filed by Mahan's attorneys summarized testimony throughout the case:

> [i]t was also shown that about 34 acres of the said land is valuable agricultural land adapted to the raising of agricultural crops or for fruits. **The balance of said land or some six acres is in the wash of the Salt River** and is a deposit of sand and gravel. [Emphasis added.]

Apparently Mahan had taken some of the sand and gravel, hauling it to Phoenix to make concrete. Immediately following its removal, according to Mahan "the excavations made thereby were . . . filled by silt washed down by the river and would thereafter grow agricultural products." Mahan contended that extraction of the sand and gravel was done not for commercial purposes, but to take advantage of the silt that subsequently filled the pits and made the land more suitable for agriculture.

In a deposition regarding this matter, Phillip Hickey disagreed. He stated that

> **[t]he 40 acres is traversed by the Salt River**, and when Flood waters come, as they frequently do, when it rains, the pits made in taking the Sand out, are filled up, the sand restored, and as this sand and gravel is only thing of value that the ground furnished . . . **it being simply River Bed Wash.** [Emphases added.]

A joint deposition signed by Clinton Lauver, D.G. Beals, P.K. Hickey, C.C. McEwen, and J.E. Rilly contained virtually the same information:

> We know the land in controversy, and **we know that it is River Bottom land**, and chiefly valuable for the Sand and Gravel upon it, it is not valuable or to any extent useful for farminfg [sic] purposes, its value is in the grade of sand and gravel it furnishes, and it is

> inexhaustible, because the River floods restore the Sand and Gravel removed. [A]nd that is a valuable commercial commodity, and worth more than anything that can be raised upon the place agriculturally. . . . **[T]he Salt River flows through the tract, and it is practically all river bed wash**, Sand and Gravel, and as Floods come down the River that at times have overflowed every foot of the ground, and to quite a depth, it is absurd to call it good agricultural land. [Emphases added.]

Further displaying the extremes of the Salt River was Lauver and Beals's "Statement of Facts," which noted that

> **the whole of the said tract has frequently in past 32 years, to our knowledge been under water from 10 to 30 feet, in River Floods**, and from those floods the character of the ground was created and the Sand and Gravel deposited have a commercial value, and sell right along, while no other things can be successfully raised upon and sold from the said ground. [Emphasis added.]

Although the evidence pointing to the river's presence was overwhelming, Mahan maintained that the river did not pass through his land "proper." Nevertheless, all other witnesses, including those testifying on Mahan's behalf, mentioned the presence of the river in the parcel. Lawrence Nelson, for example, testified that "[y]es, there is a little channel that overflows at times," and he further stated that "[a]bout 30 or 33 acres of this claim can be put under cultivation: **The rest of it is un [sic -- in] the river** and unfit for agricultural purposes." (Emphasis added.) Mahan's arguments finally succeeded and all protests were dismissed.

The documents in this case illustrate two important points: 1) they confirm the presence of the river on the land and 2) they demonstrate the irregular ebb and flow of the river. Moreover, Mahan's case gives important insight to Arizona's perception of the Salt River. First, the dispute documented that a channel of the

Salt River ran directly through this property. Furthermore, the conflict also substantiated that the land was valuable for its sand and gravel deposits. Despite these facts, the State of Arizona allowed Samuel Mahan to gain title to the land without protest. There is no evidence that state officials were involved in any aspect of the controversy, which they undoubtedly would have been had there been any claim to ownership of the bed and the banks of the river. Not only does the state's absence from this matter indicate non-navigability, but the vivid descriptions of frequent floods on the Salt River suggest its historically erratic nature. At times, this land was completely dry, while at others, the land was inundated to a depth of thirty feet. In spite of the river's presence, Mahan was given title to the full forty acres of this land in 1915.[68]

Upstream from Mahan's land was a parcel patented by John S. King, who applied to homestead the southeast quarter of the southeast quarter of section seventeen in township 1 north, range 3 east. Cash entry patent 465160 was issued to King in March 1915 for forty acres. The file created for this patent contains information demonstrating that some of the land lay in the bed of the Salt River. George W. Artis, one of the witnesses that submitted a testimonial proof for King, described the parcel as follows:

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[68] Homestead Patent No. 495328, Oct. 25, 1915, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/4]; Patent file for Homestead Entry 495328, Oct. 25, 1915, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/21].

> I should say about 15 or 20 acres of his land can be cultivated, **the rest is liable to flood from the river.** No timber except cottonwoods growing in river bed. [Emphasis added.]

James H. Deardorff augmented this information in his own statement that "[a]bout 25 acres of his land can be cultivated, the rest is liable to flood from the river when it is up."

King himself admitted that a portion of his land was subject to flooding. When asked if he had been gone from the land since settling it, he replied that he "[w]as absent over the night of Mar. 22, 1914. Left for that night account of high water, but did not move either stock or household furniture. Returned early next morning." On the next page of the proof, King described his land: "About 25 acres can be cultivated, **balance of 15 acres is liable to overflow when water is in river.** No timber except what grows along the river." (Emphasis added.) Indeed, there is no indication in either the patent or its supporting file that any acreage was withheld for Arizona's sovereign ownership. The full forty acres was granted to King in 1915 despite the clear evidence that the land lay directly in the bed of the Salt River.[69]

Within a few years, a controversy paralleling Mahan's in complexity erupted over land lying upstream to the east in what is now present-day South Phoenix. Margaret Dorn had applied for a homestead on the north half of the northwest quarter of section

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[69] Cash Entry Patent No. 465160, March 27, 1915, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/4]; Patent file for Cash Entry 465160, March 27, 1915, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/24].

twenty-one. Roy E. Cook applied for the same parcel of land. According to Cook, Dorn had physically gone to the land before it was officially thrown open to entry; on the other hand, Dorn contended that Cook had arrived on the land **after** the 9:00 a.m. opening time on March 11, 1914, at which point Dorn had staked her claim. Cook claimed he did not see Dorn on the land when he arrived shortly before noon.

Included in the file for this patent was a lengthy transcript of a hearing held to settle the matter. Numerous individuals' testimony described the land and its proximity to the river. The historical U.S. Geological Survey topographic maps and the original U.S. General Land Office survey plats show the river's presence in this parcel of land, and testimony at the hearing provides yet another source of evidence that the river flowed directly through this tract. Roy Cook answered the following questions during the hearing:

> Q: With reference to this tract, how does it lay with regard to the river?
>
> A: **The river cuts through it; the river cuts through the tract approximately two hundred feet east of the Northwest corner of this tract, and then continues through, almost due east, slightly towards the south, and the river is about five hundred feet south of the Northeast corner of the tract, and at that point the river is one hundred and twenty-five feet wide. That is at the east corner.** [Emphasis added.]
>
> Q: With reference to the number of acres, how many acres are there north of the river?
>
> A: There are about eleven acres north of the river.
>
> Q: And about how many acres south of the river?

A: There are about forty-two acres south of the river of tillable ground.

Q: About forty-two acres of tillable ground?

A: Yes, sir.

Q: About how much wash?

A: There are about twenty acres of wash south of the river.

Cook described the river further in the following exchange:

Q: How wide is the river at your place?

A: The river is about a hundred feet wide, I think, at that time. There is a lagoon on this side.

Q: It may be five hundred feet?

A: The river?

Q: Yes.

A: No, it is impossible for the river to be more than one hundred and fifty feet at the most. You are talking about that lagoon on this side. The lagoon is not the river. The lagoon is possibly one hundred and twenty-five feet long and there is a sand bar in between the lagoon and the river proper. There may be five hundred feet in all, but that is including the river proper, the lagoon and the sand bar.

Witnesses other than Cook gave additional insights as to the nature of the river on March 11, 1914. Guy Allen, who had accompanied Cook to the land, testified that he "walked out north into the river bed there quite a ways." That Allen was able to walk into the river bed that day indicated that the river probably had little, if any, water in it. Samuel Mahan also testified on behalf of Cook, stating on cross-examination that he had walked "probably one hundred yards north [on the day of settlement], on the edge of the bank, where the old river-bed used to run. . . .

Mr. Allen there went out and we also went down into the old river-bed." Henry Larson, also a witness for Cook, testified that "we paced off the west boundary of the claim, and waded the river on the west boundary and walked north to the east boundary and measured off the distance from the corner to the river." Larson's description corroborated Allen's testimony, showing that the depth and flow of the river was slight on the day of settlement.

Other witnesses gave a similar impression of the river. Francisco Rubio was asked how he happened to see the activity on the land on March 11, 1914. Rubio testified that:

> A: I was working on that day. I came up and was going to town.
>
> Q: And you came to town by that road?
>
> A: Yes, sir; went by there.
>
> Q: And crossed the river?
>
> A: Yes, sir.
>
> Q: Wasn't the river too high to ford at that time?
>
> A: No, sir.

In addition to the testimony illustrating the presence of the river on the land, other documents in the patent file provide insight on the characteristics of the river at that locale. On Margaret Dorn's final proofs, she and her two witnesses, Fred Smith and Burk Pinkerton, all noted that Dorn had been off of the land multiple times "on account of the water being up around the place." At one point, one of the witnesses even had to "[take Dorn] off in a boat, she was marooned by the floods."

It is clear from this patent and its file that the land in question contained the bed and banks of the Salt River. No land was withheld due to Arizona's sovereignty.[70]

This conclusion is bolstered by yet another representative sample of federal patenting along the Salt River. Feliciano Gutierez applied for homestead entry 469157 on land lying in sections twenty-one and twenty-two in township 1 north, range 3 east. Gutierez's application was approved and the land patented to him in April 1915. Yet according to the topographic maps created by the U.S. Geological Survey between 1904 and 1913 as well as the original survey plats created by the U.S. General Land Office in 1868, the Salt River flowed directly through the northeast corner of this land.

Although there are no comments in the final proofs submitted by Gutierez or his witnesses regarding this land lying in the river, it is clear that the U.S. Department of Interior was aware of its presence. In a "Favorable Report" issued by the General Land Office in November 1914, a copy of which is in the patent file, it was noted that

> the entry is within the limits of the Salt River Project; but it lies along the Salt River and portions at times are subject to overflow. The Reclamation Service has not designated any portion of this entry as lands to which water will ever be supplied.

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[70] Homestead Patent No. 591465, July 9, 1917, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/4]; Patent file for Homestead Entry 591465, July 9, 1917, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/22].

Obviously, the federal government knew that the river flowed through this land, yet there is no indication in the patent itself or in its file that any portion of the lands were withheld for the State of Arizona. Instead, the patent was granted in the full amount of 120 acres.[71]

Also in township 1 north, range 3 east, Rawghlie Stanford filed an application to homestead eighty acres lying in the south half of the southwest quarter of section fifteen. According to the historical mapping sources noted above, much of the land encompassed by this patent clearly lay in the Salt River bed. The final proof filed in 1914 by Frank Harris, a witness for Stanford, stated that "[a]bout 60 acres of this claim can be put under cultivation: **the rest of the claim is in the river bed** and is totally unfit for cultivation." (Emphasis added.) Testimony by William Blucks, another witness, supported Harris's statement: "All of this entry can be put under cultivation but 20 acres; **which is in the river bed** and unfit for cultivation." (Emphasis added.) No documentation exists, however, suggesting the federal government withheld acreage due to ownership by the State of Arizona.[72]

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[71] Homestead Patent No. 469157, April 20, 1915, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/4]; Patent file for Homestead Entry 469157, April 20, 1915, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/25].

[72] Homestead Patent No. 434353, Oct. 8, 1914, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/4]; Patent file for Homestead Entry 434353, Oct. 8, 1914, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/26].

Federal Patents in the Study Area on the Salt River in Township 1 North, Range 4 East: Going upstream to the next township, George J. Awrey filed an application for a homestead for land in section eighteen, township 1 north, range 4 east.[73] The application was for 78.63 acres (half of a quarter section adjusted for the curvature of the earth), all of which was granted. In section eight of this same township, homestead patent 903199 was issued in 1923 to Edward B. Rives, the assignee of Antonio C. Alvarado.[74] Similarly, Dennis Thornesberry's patent on land in section thirteen was issued in 1915.[75] Though the river ran directly through all three parcels of land according to historical U.S. Geological Survey topographic maps as well as original U.S. General Land Office survey plats, no acreage was removed to account for the state's sovereign ownership of the bed and banks of navigable bodies of water. Instead, the government granted full title to each applicant, suggesting that neither the State of Arizona nor the federal government considered the Salt River navigable.

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[73] Patent file for Homestead Entry 442932, Nov. 16, 1914, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington D.C. [LRA Box/File: 13/34].

[74] Homestead Patent No. 903199, April 13, 1923, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/6].

[75] Homestead Patent No. 503185, Dec. 11, 1915, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/6]; Patent file for Homestead Entry 503185, Dec. 11, 1915, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/29].

Likewise, all one-hundred-sixty acres of Thomas J. Parry's land, overlying sections thirteen and fourteen of township 1 north, range 4 east, was patented to him in 1920. According to the same historical mapping sources, the river ran directly through this parcel of land, located east of present-day Tempe. Supporting this fact was documentation found in the Parry's patent file. In a "Favorable Report" issued by the U.S. General Land Office in 1914, the agent described the "character of land" in this application as "Semi-arid. Adjoining banks of Salt River." Parry, on his own final proof submitted for the land, admitted that "[m]ost of the claim is river bottom." Parry did not state that "part" of the claim was river bottom, or that "some" of it was river bottom, but that "most" of the claim was river bottom, suggesting that if the river was considered navigable, **most** of this claim should have been the state's. However, no documentation existed in the file to indicate that land was withheld from the patent in order to reserve title for the State of Arizona.[76]

Federal Patents in the Study Area on the Salt River in Township 1 North, Range 5 East: At the far eastern edge of township 1 north, range 4 east, a piece of land extending into township 1 north, range 5 east, was filed for by George T. Kimbell in 1912. (All map references to patents in this township can be found on Exhibits 3-4, which are folded and inside the front pocket

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[76] Homestead Patent No. 725338, Jan. 3, 1920, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/4]; Patent file for Homestead Entry 725338, Jan. 3, 1920, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/28].

to this report.) Overlying parts of section thirteen of township 1 north, range 4 east, and section eighteen of township 1 north, range 5 east, Kimbell's patent lay where the river bed historically crossed from one township to the next. Because of section eighteen's location on the western boundary of the township, its total acreage was adjusted during surveying to accommodate the curvature of the earth. Therefore, government lot one (part of this patent) contained less than a full forty acres, making the total acreage for Kimbell's patent 159.79 acres, just short of the full one-hundred-sixty acres.

Kimbell had substantial difficulty perfecting his patent because the land, which is just south of the Salt River Indian Reservation, had been withdrawn from entry by the Reclamation Service. A file in the records of the U.S. Secretary of the Interior contains documents which give useful insight to Kimbell's dilemma as well the Salt River's navigability at the time of Arizona statehood. A hand-written letter dated February 20, 1912, is especially telling. Composed eight days after Arizona was admitted to the Union, the letter describes the Salt River in great detail. Kimbell wrote (original spellings have been retained):

> I have looked at the land very carefuly and will give you the decription [sic] of it as near as I can. . . . Years ago before Granite Reef was put in about 22 miles above here, and the Roosevelt dam was put in, The water, from the Verde River and Salt River above the Roosevelt dam, would, when the rains and snow was great up there, come down the river and spread out over the valley about 4 miles above here and cut chanals thru the valley, thru these two sections I speak of, and the sections closest to the river up to about 40 miles above here. The worst damage the water done to this part of the land was when the water cut in east of Tempe and extended up the river

to about 4 miles above here. **The water run over all the low places of these sections** mentioned and caused the people of Tempe and the people along this land mentioned to put rock and brush levies across the washes that was made by the water that come out of the river on the south side of river. The land that the two large levies were put on is the south side of the n. west eighty of section 18. Up to about 4 years ago the water would run over the low places in the levies caused by the brush giving away and animals working in them. **From the southwest corner of the northwest fourty of section 18 to the first slough north it is 51 steps. From the southwest corner going east it is 127 steps to the first slough. From the last slough mentioned on east to about halfway across the east fourty of land mentioned the land has river rock and gravel and some timber such as scruby willow and cottonwood.** There is about 10 acres of sandy soil at the southeast corner of the east 40ty of land mentioned that would do to farm. It is 100 steps from the southeast corner of the east fourty acre block, belonging [?] the northwest eighty of section 18 in Township 5 east, Range one north, to the river, and **the land I speak of runs west to a point, or to where the old river washes begins**. . . . Before I go any farther with my story, I am going to tell you more about that River. We call that chanal the river, for I saw last summer the water come down there about 8 or ten feet deep. Above this land I am now talking of, about a mile above [?] land begins and goes west. **This chanal that runs thru this eighty I am talking of is the South chanal of the river and ends as far as the west side of the north east fourty of section 13 in Township 4 east, Range one north. The land is, across its widest place, about a mile wide.** The land is in this shape [diagram] or about that shape. The upper end of it has most any kind of brush and timber on it that will grow on this river here. But not very large. **The land is made up of all kinds of river material**. . . . The South 40ty has the best land on it. There are two sloughs that runs thru the north side of the 40ty last mentioned and on down thru the three 40tys west of it. The highest part of the South part of the 40ty mentioned is about 12 feet to water. It is about two feet to water in the sloughs that I last mentioned. . . . **All this land that I have mentioned has been overrun by high water. There is a slough that joines this land on the south and goes on west about a half or 3 quarters of a mile and goes in to the sloughs north and on into the river**. . . . Last summer I waded that slough when the water was waist deep. . . . I think I have said enough about this land. I think I can make a home out of it if I can file a homestead on it. I will take chances on

> getting washed away. It will make a chicken ranch. . . . [Emphases added.]

A July 13, 1912, letter sent to Kimbell from the U.S. Department of Interior informed him that the lands he wanted had, in fact, been restored to the public domain, and therefore were available for his homestead claim. It is clear not only from Kimbell's detailed description but also from the historical U.S. Geological Survey topographic maps and the 1868 U.S. General Land Office survey plats that the land lay directly in the bed of the Salt River and had many sloughs and channels. But when the federal government restored these lands to the public domain, none were retained for Arizona due to the Salt River's navigability. Ultimately, Kimbell received title in 1916 to the entire 159.79 acres.

Aside from where the Salt River lay in relation to Kimbell's claim, his description is also revealing as to the nature of that stream. Kimbell's letter depicted a very erratic river that alternated between being totally dry to having water twelve feet deep. With the numerous channels and the changing depths of water, the Salt River would have been highly unreliable as an artery of commerce.[77]

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[77] George T. Kimbell to the Secretary of Interior, Feb. 20, 1912, First Assistant Secretary of the Interior to George T. Kimbell, July 13, 1912, "Reclamation Bureau, Salt River Project, Withdrawals & Restorations, March 4, 1908 to March 18, 1913," Box 1648, Central Classified File, 1907-1936, 8-3, Records of the Office of the Secretary of the Interior, Record Group 48, U.S. National Archives, Washington, D.C.; Homestead Patent No. 518079, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 8/7].

Also in township 1 north, range 5 east, Albert B. Harper was granted a homestead patent on the southeast quarter of the northwest quarter of section three in 1914. According to the 1904-1913 U.S. Geological Survey topographic maps as well as the 1868 U.S. General Land Office survey plats, the Salt River ran directly through well over 75% of this parcel. When Harper made his final proof, one of his witnesses described the parcel as follows:

> [Albert Harper's] father cultivated at least 4 acres under cultivation for many years, and the boy worked on the land with his father up to the time he took charge of it himself. The four acres have been used in rasing [sic] garden truck, mostly melons and cantelopes. There has been no other cultivation of this tract, because that is all that is all that is [sic] fit for cultivation. **The balance of the claim is in part of the Salt River river bed.** [Emphasis added.]

Harper's father (Harvey J. Harper) confirmed this description of the land: "[p]ractically all but the four acres is within the overflow from the river, and is part of the Salt River bottom." Albert Harper himself stated that "20 acres are in the Salt River." Even with a substantial part of this parcel in the Salt River bed, there is no indication in either the patent itself or the patent file that the federal government withheld any acreage due to Arizona's sovereign right to the ownership of the beds and banks of navigable bodies of water.[78]

Also in section three of township 1 north, range 5 east, was a reclamation homestead entry deeded to Orlando Merrill in January

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[78] Homestead Patent No. 405842, May 15, 1914, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/8]; Patent file for Homestead Entry 405842, May 15, 1914, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/30].

1920. According to both the historical U.S. Geological Survey topographic maps and the original 1868 U.S. General Land Office survey plat, the Salt River passed directly through this forty-acre parcel. Merrill's patent file contains documents also indicating that the river bed was in the patented lands. In his final proof in response to the question asked regarding absences from the land, Merrill stated:

> Went away on leave of absence about August 1914 and returned in October 1914. My wife and family have not lived there with me as my wife refused to do so because **the land is in the river bed** and she was afraid of the floods. [Emphasis added.]

Testimony of witnesses for the final proof backed up this statement. Thomas Jones noted that "[Merrill's] family have [sic] been there at times but have not made it their permanent home on account of the floods."

As if these documents were not clear enough about the land being in the river, Merrill and his wife wrote a letter to the U.S. General Land Office in Washington, D.C., on February 12, 1919. In the letter, Lucy Merrill pleaded with the Land Office to grant title of the parcel to her husband, stating that

> **[t]his forty acres is situated in the river bed.** There are about 20 acres which could be used for farming[.] [T]his 20 acres is composed of rich river silt and is very valuable for gardening and raising small crops such as berries pea-nuts etc. [Emphasis added.]

Discussing the improvements that her husband had made on the parcel, she noted that

> I, his wife; however refused to live there with my family of five small children-; as **during the rainy periods the land is surrounded by water for several weeks at a time;** and did not consider it safe nor wise to take my children

> where I could not summon medical aid at any time for my very delicate child. [Emphasis added.]

Lucy Merrill then described the floods of 1916:

> In the winter of 1916 the Salt River rose higher than for 25 years washing away the flume which my husband had built across the Tempe canal also flooding a portion of his claim including a part of that which he had cultivated[.] [I]t also coverd [sic] and washed away that part of the fence which was on the lower side of his claim.

This documentation illustrates two critical things about the Salt River's characteristics. First, the settlers' fears of violent flooding indicates the unpredictable nature of this stream. Second, the historical record contains numerous statements that this parcel of land lay in the bed of the Salt River. Following the floods of 1916, Merrill himself stated that "[a]bout 17 acres were cultivable before the flood but there is virtually no cultivable land there now, **the whole being river bed.**" (Emphasis added.) Nonetheless, the U.S. General Land Office granted the full forty acres to Merrill in 1920 without withholding any acreage for the State of Arizona. Both the unreliable nature of the river and the failure to recognize Arizona's sovereign ownership of the bed and banks are strong indications of the non-navigable nature of the Salt River.[79]

Federal Patents in the Study Area on the Salt River in Township 2 North, Range 5 East: In section thirty-four of township

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[79] Reclamation Homestead Patent No. 728752, Jan. 20, 1920, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/8]; Patent file for Reclamation Homestead Entry 728752, Jan. 20, 1920, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C. [LRA Box/File: 13/32].

2 north, range 5 east, according to both the historical U.S. Geological Survey topographic maps and the 1868 U.S. General Land Office survey plats, the river flows directly through the land in cash entry patent 558. Lovina V. Davis was granted this forty acres of land on August 8, 1896. Though the river passes directly through where the land lies, there is no indication that any land was withheld for the state for the purposes of granting it the bed and the banks of the river.[80]

Patent 558 is representative of many of the remaining patents for this township, most of which are Indian Trust Patents because they are within the Salt River Indian Reservation. While smaller in acreage than patents granted to non-Indians, there is nonetheless no indication that there was ever any concern about the bed and the banks of the Salt River being owned by the state when any of these patents were awarded.

Federal Patents in the Study Area on the Salt River in Township 2 North, Range 6 East: The uppermost part of the study area for this report is in township 2 north, range 6 east. Though much of this land was reserved by the federal government for the Salt River Indian Reservation, there were two patents granted to individuals in sections twenty-nine and thirty of this township that further demonstrate the U.S. government's lack of concern that the bed and the banks of the Salt River might belong to Arizona. Cash entry patent 576 was issued to Oscar Crismon in 1891, and the

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[80] Cash Entry Patent No. 588, Aug. 24, 1896, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/9].

Salt River's bed lay directly in this parcel. Nevertheless, the patent still contained the full one-hundred-sixty acres. There is no indication in the patent itself that any exception was made for withholding the bed of the Salt River due to a possible claim of ownership by the State of Arizona.[81]

Also in section thirty, south of the Salt River Indian Reservation lay the land encompassed in reclamation homestead entry patent 700125. Because it includes a parcel of land lying on the western boundary of the township and therefore was adjusted to accommodate the curvature of the earth, the tract contains 75.94 acres rather than the full eighty acres. According to the 1904-1913 U.S. Geological Survey topographic maps and surveys done by the U.S. General Land Office in 1868, the Salt River ran directly through this land. Nonetheless, there is no indication that the federal government withheld any lands due to a possible claim of ownership by the State of Arizona. It can therefore be inferred that the federal authorities did not believe the river to be navigable.[82]

THE DESERT LAND ACT OF 1877: In addition to land patented under the various homestead and reclamation laws already discussed, the U.S. Congress passed the Desert Land Act on March 3, 1877, intending to provide further opportunity to settle western lands.

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[81] Cash Entry Patent No. 576, Oct. 16, 1891, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/10].

[82] Reclamation Homestead Patent No. 700125, July 23, 1919, Records of the U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 13/10].

This law, unlike the other homestead statutes, allowed a settler to file an application for up to six-hundred-forty acres, by far the largest tract of land allowed for a single person under any of the U.S. homestead laws. The act required that the settler reclaim and cultivate a piece of desert land through irrigation before a final patent would be awarded. The law also specified that the water to be used for irrigation was to come from a non-navigable stream:

> Provided however that the right to the use of water by the person so conducting the same, on or to any tract of desert land of six hundred and forty acres shall depend upon bona fide prior appropriation: and such right shall not exceed the amount of water actually appropriated, and necessarily used for the purpose of irrigation and reclamation: and all surplus water over and above such actual appropriation and use, together with the water of all, lakes, rivers and other sources of water supply upon the public lands and **not navigable**, shall remain and be held free for the appropriation and use of the public for irrigation, mining and manufacturing purposes subject to existing rights. [Emphasis added.]

In short, the Desert Land Act stated that land patented under this statute had to be reclaimed through water obtained by prior appropriation and that the appropriation had to be from a non-navigable stream.

In the townships along the Salt River from the confluence with the Gila to Granite Reef Dam, there were forty-one applications for land under the Desert Land Act. All of the applicants intended to obtain water from the Salt River, and all forty-one applications were accepted by the U.S. General Land Office in Phoenix. The logical conclusion from these applications is that the Salt River (as the source for reclamation of these lands) must have been considered non-navigable by the applicants as well as by the

administrators of the U.S. General Land Office. Although many of the applications were subsequently cancelled or relinquished due to failure to fulfill the Desert Land Act's requirements, the mere fact that the applications were initially accepted indicates a contemporaneous belief that the Salt River was not navigable. There is no indication the cancellations and relinquishments were due to the navigability of the Salt River.[83]

The history of the study area's Desert Land Act patents supports the conclusions gleaned from the representative homestead and cash entry patents discussed above. Similar to those patents, no mention was made in the Desert Land Act applications of reserving the bed and the banks of the Salt River due to the sovereign rights of the state.

FEDERAL LAND GRANTS TO ARIZONA: Arizona, like other public domain states, obtained land by Congressional grants to support certain public interest objectives prior to and following statehood. Historically, such grants to new states had started with Ohio's admission to the Union in 1802, although over the years the types and sizes of the grants varied from state to state. Grants to Arizona covered a variety of purposes. For example, prior to statehood, Congress reserved for Arizona all sections sixteen and thirty-six for the purpose of supporting public schools. At statehood, sections two and thirty-two were added (also for schools), with all four sections totaling 8,093,156

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[83] Desert Land Act, 19 U.S. Stat. 377 (1877) [LRA Box/File: 9/15].

acres. In addition to this land, 1,446,000 more acres were given to Arizona instead of the internal improvement, swamp, saline, and agricultural college grants provided to earlier states. Moreover, an additional one million acres were granted to Arizona to pay for bonds issued by certain counties.

Aside from sovereign lands (which were determined by navigability and not by an act of Congress) and lands in sections 2, 16, 32, and 36, Arizona was allowed considerable leeway in selecting the other federally granted lands. In addition, Arizona had flexibility in selecting "in-lieu" or indemnity acreage if mineral lands (which were denied to the state) or Indian reservations overlay any section 2, 16, 32, or 36. Likewise, if a navigable body of water overlay any of these four sections, the state could take lands equal in size to the total area of the bed of the body of water elsewhere. Significantly, Arizona made no in-lieu selections to compensate for the area covered by the Salt River's bed in sections 2, 16, 32, and 36 or in other federal lands granted to the state where they overlay the Salt.

Federal Grant to Arizona in Township 1 North, Range 2 East: Along the Salt River between township 1 north, range 1 east, and township 2 north, range 6 east, only one parcel was granted by the federal government to Arizona other than the acreage in sections 2, 16, 32, and 36. That grant overlays the Salt in section twenty-nine of township 1 north, range 2 east. Because Arizona in 1983 gave up a total of one-hundred-forty acres in another part of the state for the construction of the Central Arizona Project, state

officials were therefore entitled to choose other public domain lands "in lieu" of the relinquished parcels. The indemnity lands selected by Arizona were the northeast quarter of the northeast quarter, the south half of the southwest quarter of the northeast quarter, and the north half of the southwest quarter of section twenty-nine. All of the in-lieu lands lie directly in the bed of the Salt River. Therefore, if Arizona authorities had considered the river to be navigable as of 1912, the land **already** would have been owned by the state by virtue of its sovereign rights, and Arizona would not have exercised its right to an in-lieu selection for this parcel.[84]

BACKGROUND TO STATE ACQUISITION AND DISPOSITION OF FEDERAL LANDS: In the years following statehood in 1912, Arizona's officials confronted the daunting task of disposing of millions of acres given to the state by Congress for various purposes. To do this, the Arizona State Legislature created an initial version of the Public Land Code in a special 1915 session, which laid out the manner in which the state would dispose of its public land. The basic procedure established by the code was to advertise the proposed sale of state land for at least ten successive weeks in a newspaper regularly circulated in Phoenix, send an appraiser to the land to make a report and set a minimum price, and then sell the land to the highest bidder. The purchaser would receive a certificate of purchase, indicating his or her promise to pay any

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[84] School Indemnity Selection List No. 589, 1983, U.S. Bureau of Land Management, Phoenix, Arizona [LRA Box/File: 3/35].

balance in addition to state taxes. Once full payment had been received, an Arizona state patent was issued.

STATE ACQUISITION AND DISPOSITION OF LANDS ALONG THE SALT RIVER: The above discussion on state land legislation is vital to an understanding of how Arizona accepted and disposed of federal land grants and what the state's actions show about the navigability of the Salt River. Probably the best examples of state officials' perceptions of the Salt are records held by the Arizona State Land Department. These documents record how the state obtained title from the U.S. government to specific parcels in the Salt River region and how the state disposed of some of those holdings to private parties. While federal land grants to Arizona have been discussed earlier in this report (see page 104), this section of the report will examine what Arizona's own records show about the state's acquisition and disposition of public lands. The discussion begins with downstream areas near the Salt's confluence with the Gila and moves upstream toward Granite Reef Dam. (For the location of state patents discussed here, see the folded map in the pocket at the back of this report.) Information about state patents is derived from the state patents themselves and related state patent files at the Arizona State Land Department.

State Patents in Township 1 North, Range 1 East: One parcel of land granted by the federal government to the State of Arizona lay in section thirty-six of township 1 north, range 1 east -- the lower-most section of the study area for this report. These lands

were obtained when Congress passed the 1910 Enabling Act, which authorized the formation of the State of Arizona. The relevant area in section thirty-six is the northwest quarter, which eventually became state patent 662. The Salt River, according to the 1868 U.S. General Land Office survey plat of this township as well as the historical U.S. Geological Survey quadrangles, flows through this parcel of land.

The State of Arizona patented this parcel to Eugene D. Goldman in 1923. According to the state patent, Goldman received title to this tract containing 159.40 acres. In passing title to Goldman, Arizona made no exception to keep the bed of the Salt River, as the transfer of the full 159.40 acres demonstrates. (The reason for the missing six-tenths of an acre is unclear, but far more than this would have been removed from the parcel had the state claimed the bed and banks of the Salt River.) Not only did Arizona not claim the bed and banks, no lands were selected in lieu of the Salt River's acreage in this patent.[85]

Directly upstream and to the east of Goldman's land was a parcel lying in the northeast quarter of section thirty-six. According to the original U.S. General Land Office survey plats and the historical U.S. Geological Survey topographic maps, the Salt River and its bed are in the northwest corner of this land. Nonetheless, the State of Arizona granted title to M.B. Harovitz for 158.79 acres in 1923. (Thirty-three feet along the eastern

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[85] Arizona State Patent No. 662, March 21, 1923, Records of the Arizona State Land Department, Phoenix, Arizona [LRA Box/File: 13/2].

edge of the parcel were removed for a public road.) If Arizona had wished to make an exception for the lands covered by the Salt because state officials considered the river to be navigable, they would have removed additional acreage from the tract. Furthermore, the state would have selected lands in lieu of the acreage covered by the river (had it been deemed navigable) when granted the parcel by the federal government. This process would have been noted on the U.S. Bureau of Land Management's master title plat by a reference to "IL __," indicating the "in-lieu list" number upon which the selected lands were noted. No such list number exists here. No indemnity lands were chosen to replace lands covered in this section by the river, and the state sold its full rights to the land without making exception for the bed and the banks.[86]

State Patents in Township 1 North, Range 3 East: The State of Arizona also granted numerous patents to individuals for land lying in section sixteen of township 1 north, range 3 east. This land had been granted to Arizona for the purposes of common schools by the 1910 Enabling Act, and according to the 1868 U.S. General Land Office survey plats and historical U.S. Geological Survey topographic maps, the Salt River ran directly through this section. Importantly, no lands were selected in other parts of the state in lieu of the lands covered by the river. Furthermore, more than fifteen patents covered by the Salt River were deeded out to individuals by the state.

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[86] Arizona State Patent No. 659, March 21, 1923, Records of the Arizona State Land Department, Phoenix, Arizona [LRA Box/File: 13/2].

One such parcel through which the Salt River flowed was state patent 218. Deeded to Jean Orteig in 1918, the patent contains no indication that any acreage was withheld due to the presence of the bed and the banks of the river. Orteig had applied to purchase the lands after the Arizona State Land Department advertised that it was accepting bids "in conformity with the provisions of the Public Land Code of the State of Arizona, approved June 26, 1915," which required an appraiser's report of all lands sold by the state. The resulting appraiser's report noted that "[t]hese tracts lie almost entirely in the Salt River bottom -- are rough and uneven -- Now used as city dumping ground." In spite of the state's knowledge that this land lay in close proximity to, or actually in, the bed of the river, it patented out the entire parcel without removing any acreage due to Arizona's sovereign ownership of the bed.[87]

To the north of Orteig's land is a parcel encompassed by state patent 217. Again, according to the 1868 U.S. General Land Office survey plats as well as the historical U.S. Geological Survey topographic maps, this tract lies directly in the bed of the Salt River. Documentation found in patent 217's supporting file also indicate the presence of the river. On Valley Meat Company's application to buy the state lands, the applicant drew a sketch of the piece of land in question. The map clearly shows what was labeled "Salt River" running through the land. The application also described the land in text: "A few cottonwood trees grow in

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[87] State Patent No. 218 and corresponding file, Sept. 23, 1918, Records of the Arizona State Land Department, Phoenix, Arizona [LRA Box/File: 13/5].

edge of River. . . . [T]his is on edge of Salt River and part of it overflows in flood times." The state never chose any lands in lieu of those in section sixteen covered by the river, and in the case of patent 217, the state did not remove any acreage due to ownership of the bed and the banks of the river. Both are strong indications of non-navigability.[88]

South of these two patents in the southwest quarter of the southwest quarter lies state patent 1902. Patented to the Schmidt-Hitchcock Contractors in 1936, the title granted 78.22 acres of land. However, according to the original U.S. General Land Office survey plats as well as the historical U.S. Geological Survey topographic maps, this entire parcel of land lies in the river bed and the river runs directly through it. Nonetheless, there is no indication that any land was withheld from the patentee.[89]

State Patents in Township 1 North, Range 4 East: Section sixteen of township 1 north, range 4 east, was granted to the State of Arizona through the 1910 Enabling Act. According to the 1868 U.S. General Land Office original survey plats as well as the historical U.S. Geological Survey topographic maps, the north half of this section is covered by the Salt River and its bed. In a confusing situation for the state, the federal government withdrew certain lands for the Salt River Valley and Yuma Irrigation

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[88] State Patent No. 217 and its corresponding file, Sept. 23, 1918, Records of the Arizona State Land Department, Phoenix, Arizona [LRA Box/File: 13/5].

[89] State Patent No. 1902, Nov. 6, 1936, Records of the Arizona State Land Department, Phoenix, Arizona [LRA Box/File: 13/5].

projects in 1902, including all of section sixteen in this township. Holding that it owned this land in spite of the federal withdrawal, the state issued patents to all of the land following statehood in 1912. State patents 1841 and 2559 lie in the north half of section sixteen (through which the river flows), and were deeded out in 1935 and 1942, respectively. Similar circumstances existed elsewhere in the state, and to clarify the situation, Arizona State Land Commissioner Charles P. Mullen wrote to the U.S. Secretary of the Interior in 1938 asking for restoration of the school sections to the state.

Mullen's 23-page letter made note of all land to which the state wanted restored title, claiming that without restoration "great financial loss to the state and purchasers would result, and the havoc thus caused would practically bankrupt the state." The Arizona State Land Commissioner stated that "[o]n October 1, 1935, the State of Arizona issued patent to the City of Tempe for a tract of land being in the N1/2 of the N1/2 of Said Sec. 16, and this land is now used for sewerage disposal plant of the City of Tempe." The Department of Interior responded promptly by restoring and therefore clearing title to all of the lands requested. Thus, clear title to state patents 1841 and 2559 was finally confirmed. Yet despite the presence of the river, there is no indication that when seeking to clear title, the state attempted to withhold acreage for the bed and the banks due to navigability. Furthermore, Arizona never contended that the state owned any of

these lands due to its sovereignty. Instead, Mullen claimed ownership only by virtue of the 1910 Enabling Act.[90]

CONCLUSIONS REGARDING FEDERAL LAND PATENTS TO PRIVATE PARTIES, GRANTS TO THE STATE OF ARIZONA, AND STATE PATENTS: In conclusion, the federal government granted over two hundred twenty-five separate patents that touched or overlay the lower Salt River to private individuals. In not one case did any of these patents or the supporting patent files indicate that acreage was being withheld due to possible ownership of the bed of the Salt River by the State of Arizona. In each case where patents were applied for, several parties expressed implicit opinions on the navigability of the Salt through the request for and award of lands through which the river flowed. These included the patentee, his witnesses, and officials of the U.S. General Land Office. It is significant that cumulatively, literally hundreds of people made judgments concerning the Salt River's navigability in this manner -- opinions spread chronologically in many years, throughout different seasons, and over a large geographic area.

Just as important, however, was how Arizona officials perceived the Salt. The in-lieu grant in the Salt River bed awarded to the State of Arizona directly did not give any indication that Arizona authorities believed the state was receiving lands it already owned due to the presence of the bed of

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[90] Charles P. Mullen to Commissioner of U.S. General Land Office, April 11, 1938, "Folder 124," Box 4, Records of the State Land Department, Record Group 59, Arizona State Archives, Phoenix, Arizona [LRA Box/File: 8/1].

the river. Furthermore, the patents issued by the state to private parties for land through which the river ran provided another perspective. If the state believed it owned the bed and banks of the river, it certainly would have considered the stream's navigability in disposing of those lands. Collectively, therefore, federal patents, Congressional grants to Arizona, and state patents strongly suggest that both federal and state officials did not perceive the Salt River to be navigable.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ARIZONA
(MARICOPA COUNTY)
CAMELBACK QUADRANGLE

E.M. Douglas, Geographer.
T.M. Bannon, in charge of section.
Topography by T.M. Bannon, C.H. Birdseye, S.S. Stahl, and Reclamation Service.
Triangulation by A.H. Thompson and T.M. Bannon.
Surveyed in 1902 1904.

SCALE 1:62500

CONTOUR INTERVAL 50 FEET
DATUM IS MEAN SEA LEVEL

Polyconic projection. To place on 1927 North American datum move projection lines 460 feet south and 350 feet west

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1933

CAMELBACK, ARIZ.
N3330—W11145/7.5
1904

FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON 25, D. C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ARIZONA
DESERT WELLS QUADRANGLE

DESERT WELLS, Ariz.
N3315—W11132.5/7.5
1954

Polyconic projection. To place on 1927 North American datum move projection lines 350 feet west and 900 feet south

SCALE 1:62500

CONTOUR INTERVAL 50 FEET
DATUM IS MEAN SEA LEVEL

E. M. Douglas, Geographer.
T. M. Bannion, in charge of section.
Topography by C. H. Birdseye, S. S. Shahland D. F. Moor
Triangulation by T. M. Bannion.
Surveyed in 1905.

FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER 2, COLORADO OR WASHINGTON 25, D. C.
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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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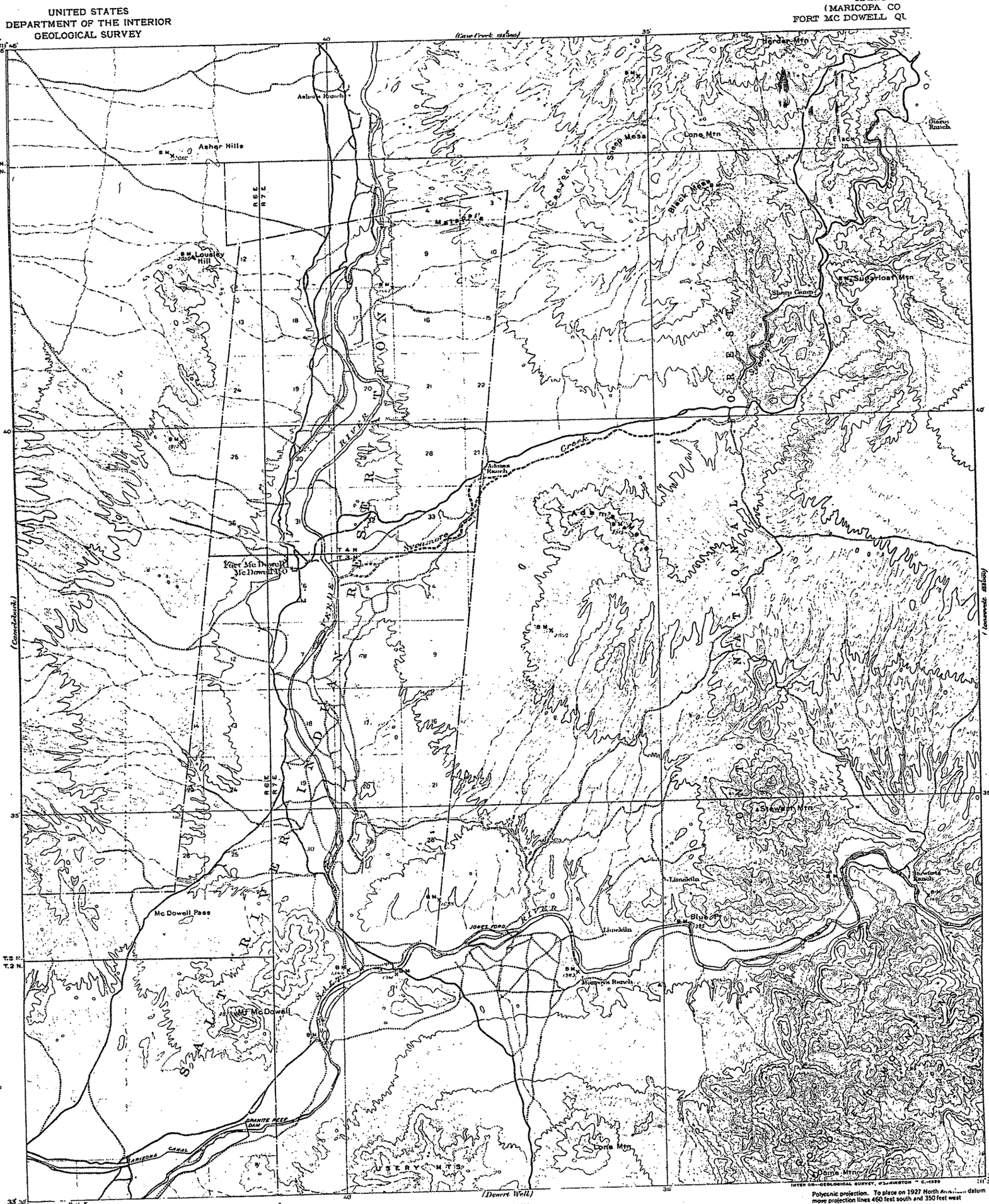

E.M.Douglas, Geographer.
T.M.Bannon, in charge of section.
Topography by T.M.Bannon, C.H.Birdseye, and S.S.Stahl.
Triangulation by T.M.Bannon.
Surveyed in 1964.

SCALE 1:62500

CONTOUR INTERVAL 50 FEET
DATUM IS MEAN SEA LEVEL

Polyconic projection. To place on 1927 North American datum move projection lines 460 feet south and 350 feet west

FT. MCDOWELL, ARIZ
N.
1130/15

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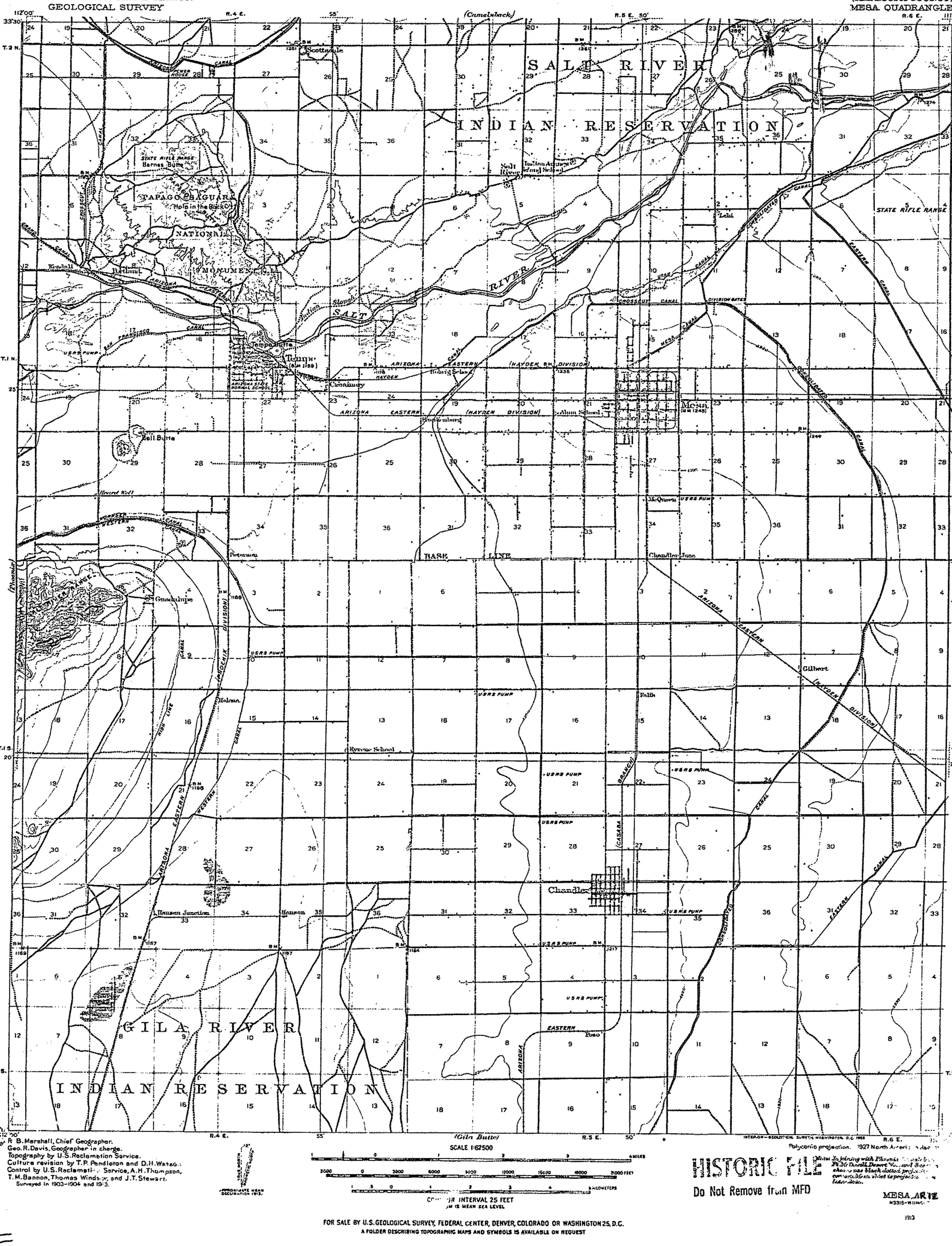
A CIRCULAR DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ARIZONA
(MARICOPA COUNTY)
MESA QUADRANGLE



R. B. Marshall, Chief Geographer.
Geo. R. Davis, Geographer in charge.
Topography by U.S. Reclamation Service.
Culture revision by T.P. Pendleton and D.H. Watson.
Control by U.S. Reclamation Service, A.H. Thompson,
T.M. Bannon, Thomas Windsor, and J.T. Stewart.
Surveyed in 1903-1904 and 1913.

SCALE 1:62500

CONTOUR INTERVAL 25 FEET
DATUM IS MEAN SEA LEVEL

Polyconic projection. 1927 North American datum

HISTORIC FILE
Do Not Remove from MFD

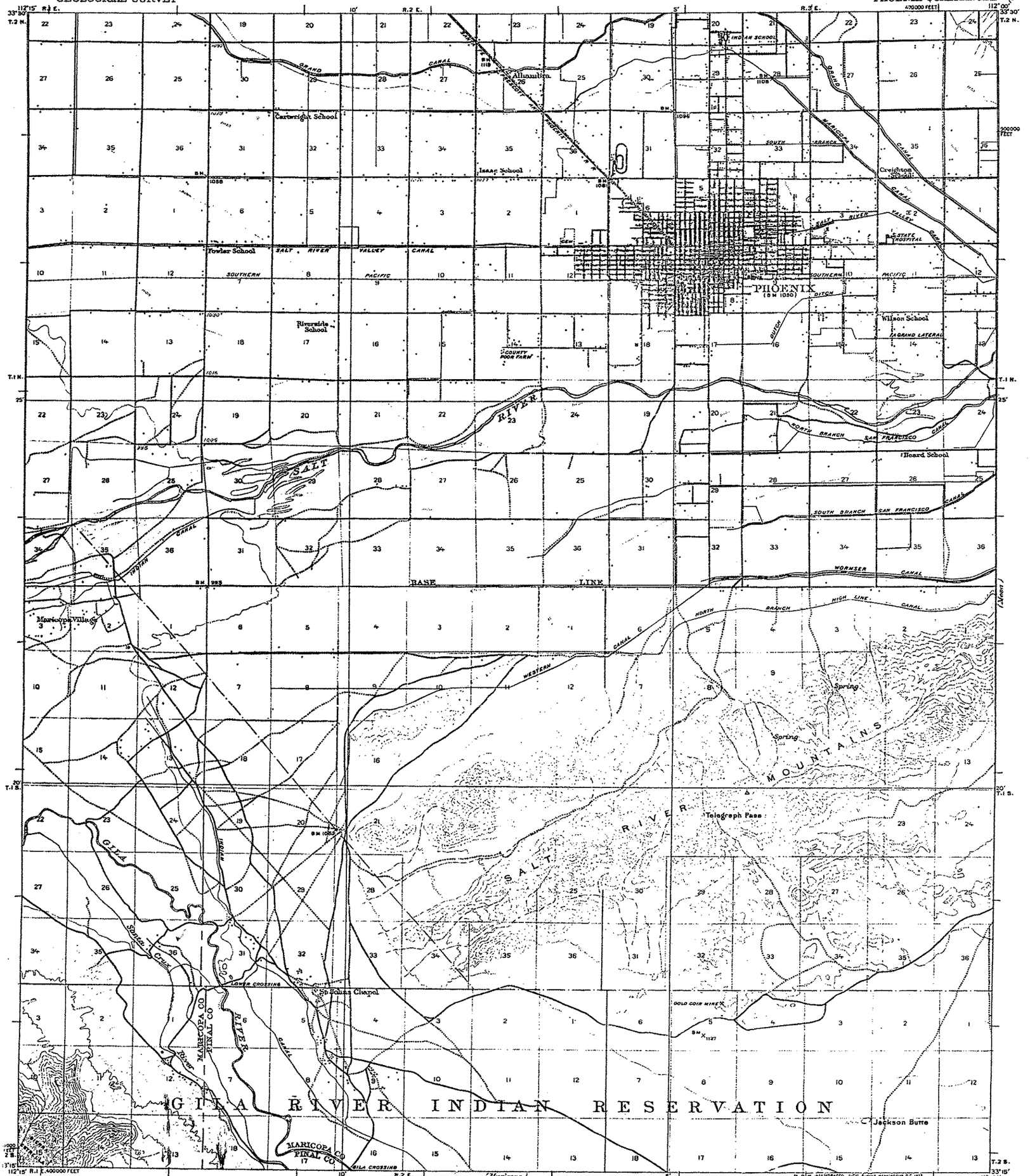
MESA, ARIZ.
1913

FOR SALE BY U.S. GEOLOGICAL SURVEY, FEDERAL CENTER, DENVER, COLORADO OR WASHINGTON 25, D.C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

118

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ARIZONA
PHOENIX QUADRANGLE



R.B. Marshall, Chief Geographer.
T.G. Gerdine, Geographer in charge.
Topography by T.P. Pendleton and Reclamation Service.
Control by A.H. Thompson, J.T. Stewart, and Reclamation Service.
Surveyed in 1903–1904 and 1912.

APPROXIMATE MEAN DECLINATION 1912.

SCALE 1:62500

CONTOUR INTERVAL 25 FEET
DATUM IS MEAN SEA LEVEL

Polyconic projection. To place on 1927 North American datum move projection lines 460 feet south and 350 feet west
10000 foot grid based on Arizona (Central) rectangular coordinate system

ARIZ
PHOENIX
N3315—W11200.

1912

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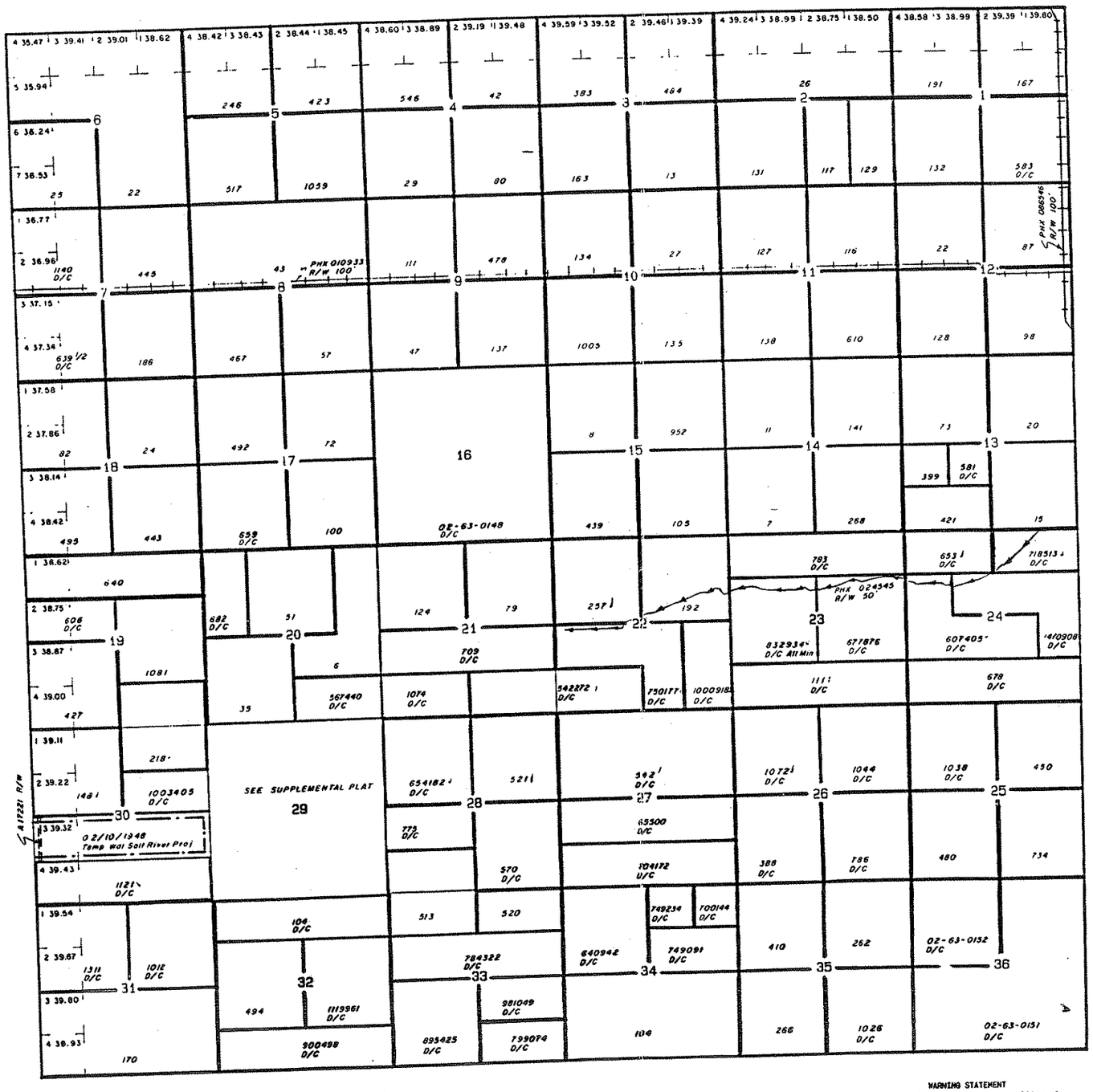
51

TOWNSHIP 1 NORTH RANGE 2 EAST OF THE GILA AND SALT RIVER MERIDIAN, ARIZONA

STATUS OF PUBLIC DOMAIN
LAND AND MINERAL TITLES

MARICOPA COUNTY



SCALE
10 5 0 10 20 30 60
30 chains to the inch

INDEX TO SEGREGATED TRACTS

RESURVEY	ORIGINAL SURVEY			
TRACT NO.	T	R	SEC	SUBDIVISION

FOR ORDERS EFFECTING DISPOSAL OR USE OF UNIDENTIFIED LANDS WITHDRAWN FOR CLASSIFICATION, MINERALS, WATER AND/OR OTHER PUBLIC PURPOSES, REFER TO INDEX OF MISCELLANEOUS DOCUMENTS.

DIST. NO. 2

CURRENT TO	BY

Feb 21 11 38 AM '96

T. 1 N.
R. 2 E.

WARNING STATEMENT

This plat is the Bureau's Record of Title, and should be used only as a graphic display of the township survey data. Records hereon do not reflect title changes which may have been effected by later(s) movements of rivers or other bodies of water. Refer to the rectified surveys for official survey information.

TOWNSHIP 1 NORTH RANGE 2 EAST OF THE GILA AND SALT RIVER MERIDIAN, ARIZONA

SECTION OR TRACT	SUBDIVISION																LOTS	OTHER DESCRIPTION	ACRES	KIND OF ENTRY —OR— PURPOSE OF ORDER	SERIAL FILE —OR— ORDER NUMBER	DATE OF ACTION	DATE POSTED	— REMARKS — E.G. DATE CLOSED, TERMINATED, REJECTED OR RESCINDED
	NE 1/4				NW 1/4				SW 1/4				SE 1/4											
	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE								
	FOR ORDERS EFFECTING DISPOSAL OR USE OF UNIDENTIFIED LANDS WITHDRAWN FOR CLASSIFICATION, MINERALS, WATER, AND/OR OTHER PUBLIC PURPOSES, REFER TO INDEX OF MISCELLANEOUS DOCUMENTS																							
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15					x	x	x	x											160.00	CE Pat.	8	4/28/1873		
12					x	x	x	x											160.00	CE Pat.	22	4/10/1874		
13													x	x	x	x			160.00	CE Pat.	15	4/10/1874		
10									x	x	x	x							160.00	Scrip Pat.	1005	4/15/1875		
19															x	x								
30	x	x																	160.00	CE Pat.	218	10/30/1875		
2	x	x	x	x															160.00	TC	F 2	2/12/1876		Canc. 6/10/1878
4									x	x	x	x							160.00	TC	F 3	2/12/1876		Rel. 2/23/1878
20									x	x									80.00	HE	F 17	2/24/1876		Rel. 9/13/1876
8					x	x	x	x											160.00	TC	F 5	4/14/1876		Rel. 12/20/1878
18													x	x	x	x			160.00	HE	F 23	7/18/1876		Canc. 10/10/1884
18	x	x	x	x															160.00	TC	F 13	12/22/1876		Canc. 7/14/1882
26					x	x													80.00	DLE	F 42	6/7/1877		Canc. 5/23/1884
26	x			x															80.00	TC	F 23	6/11/1877		Rel. 5/4/1885
18					x												1		77.58	DLE	F 48	6/11/1877		Canc. 5/23/1884
17	x	x	x	x															160.00	CE Pat.	72	11/10/1877		
13									x	x	x	x							160.00	HE	F 46	12/31/1877		Canc. 2/2/1881
4									x	x	x	x							160.00	TC	F 29	3/2/1878		Rel. 12/20/1878
6									x	x	x	x							152.77	TC	F 31	3/14/1878		Canc. 12/9/1881
2															x	x			80.00	TC	F 27	3/18/1878		Rel. 12/20/1878
1															x	x			80.00	TC	F 32	4/3/1878		Canc. 8/28/1883
1													x			x			80.00	HE	F 50	4/3/1878		Canc. 8/28/1883
15									x	x	x	x							160.00	HE	F 54	5/6/1878		Canc. 10/18/1879
12	x	x	x	x															160.00	CE Pat.	87	5/16/1878		
1	x	x	x	x															159.19	TC	F 43	9/18/1878		Canc. 4/24/1883
8	x	x	x	x															160.00	TC	F 46	10/16/1878		Canc. 9/30/1879
12													x	x	x	x			160.00	CE Pat.	98	11/5/1878		
20									x	x									80.00	HE	F 71	12/9/1878		Canc. 8/6/1881
					ENTIRE TOWNSHIP													IN IE		EO Wdt. Pima & Maricopa Indians		1/10/1879		Rev. EO 6/14/1879
					ENTIRE TOWNSHIP													IN IE		EO Rev. Pima & Maricopa Indians EO 1/10/1879		6/14/1879		
14									x	x	x	x							160.00	HE Pat.	7	11/10/1879		
30					x	x	x	x											158.33	HE	F 110	5/24/1880		Rel. 9/12/1882
2									x	x	x	x							160.00	CE Pat.	131	9/1/1880		
10					x	x	x	x											160.00	CE Pat.	134	9/1/1880		
10													x	x	x	x			160.00	CE Pat.	135	9/1/1880		
14	x	x	x	x															160.00	CE Pat.	141	9/1/1880		
14					x	x	x	x											160.00	HE Pat.	11	11/20/1880		
8									x	x	x	x							160.00	DLE	T 207	8/29/1881		Canc. 8/24/1883
11	x	x	x	x															160.00	CE Pat.	116	9/17/1881		
12									x	x	x	x							160.00	CE Pat.	128	9/17/1881		
2															x			x	80.00	CE Pat.	129	9/17/1881		
6									x	x	x	x							152.77	TC	T 67	12/29/1881		Rel. 9/19/1887
20						x	x												80.00	HE	T 161	6/21/1882		Rel. [illegible]
4					x	x	x	x											157.49	TC	T 71	7/24/1882		Canc. 4/29/1887
13									x	x	x	x							160.00	TC	T 72	10/7/1882		Canc. 5/8/1883
4									x	x	x	x							160.00	HE Pat.	29	1/20/1883		
11													x	x	x	x			160.00	HE	T 201	6/4/1883		Rel. 3/4/1887

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CHAPTER 3: U.S. GOVERNMENT HISTORICAL RECORDS -- REPORTS AND OTHER DOCUMENTS

Although U.S. government survey records and documents relating to federal and state patents are crucial to understanding perceptions of the Salt River prior to and in 1912, other U.S. government records -- both published and unpublished -- provide a wealth of supplemental information concerning that stream. Two of the most important federal agencies concerned with the region were the U.S. Geological Survey and the U.S. Reclamation Service. Both of these Department of the Interior agencies were heavily involved in the development of water resources in the American West in the late nineteenth and early twentieth centuries, and their records paint vivid pictures of the Salt River before and at the time of Arizona statehood. Aside from the Geological Survey and the Reclamation Service, another federal agency whose records reveal the nature of the Salt River include the U.S. Department of Agriculture, especially its Office of Experiment Stations. This agency established field stations to advance agriculture and irrigation and in carrying out its work collected useful data on the Salt River.

Because of the importance of the records of the Geological Survey, the Reclamation Service, and the Department of Agriculture as farming and water-related agencies, the documents they created will be discussed in detail in this report. There were, however, other federal agencies whose responsibilities brought them into contact with the Salt River. For example, the Indian Service

(today, the Bureau of Indian Affairs) administered the Gila and Salt River Indian reservations, and that agency had an interest in the Salt River because it formed part of the reservations' boundaries as well as due to irrigation needs. Similarly, the files of the Office of the Secretary of the Interior (the "parent" to the Geological Survey, Reclamation Service, and Indian Service) also contain descriptions of the Salt River. Although Indian Service and Office of the Secretary of the Interior records were thoroughly reviewed for this report, their characterizations of the Salt mirror those of the Geological Survey, the Reclamation Service, and the Department of Agriculture. Therefore, to avoid needless repetition, only the latter three agencies' papers will be reviewed here. That discussion will cover representative examples of thousands of pages of documents all substantiating that the Salt River was never viewed as a reliable means of commercial navigation.

RECORDS OF THE U.S. GEOLOGICAL SURVEY: The U.S. Geological Survey had become involved in examining water resources in the West as early as 1888, when the agency's director, John Wesley Powell, began what became known as the "Powell Irrigation Survey." Essentially a study of which arid lands in the West might be reclaimed by storing and diverting water from the region's streams, Powell's work led to increasingly frequent commentary in the Geological Survey's records regarding water resources throughout the western part of the United States.

U.S. Geological Survey Annual Reports: The yearly reports drafted by the Geological Survey contain detailed information on many streams in the West, including the Salt River. For example, the Eleventh Annual Report of the U.S. Geological Survey (1891), which focussed specifically on irrigation, described the Salt in conjunction with other streams draining the Gila Basin. Stating that all rivers in this basin were highly erratic, John Wesley Powell, who authored the annual report, wrote:

> In this basin are found rivers most difficult and dangerous to examine and control, differing in character and habit from those of the North as widely as in geographic position. In place of the regularly recurring annual floods of spring and early summer, so strongly marked on the discharge diagrams of other basins, these rivers show conditions almost the reverse, being at that season at their very lowest stages -- even dry -- and rising in sudden floods at the beginning of and during the winter. These floods are of the most destructive and violent character; the rate at which the water rises and increases in amount is astonishingly rapid, although the volume is not always very great. . . . From this it will be recognized that the onset of such a flood is terrific. Coming without warning, it catches up logs and bowlders [sic] in the bed, undermines the banks, and, tearing out trees and cutting sand-bars, is loaded with this mass of sand, gravel, and driftwood -- most formidable weapons for destruction.[91]

Streams such as those described by Powell, with such violent fluctuations in flow and carrying such destructive debris, would have been difficult to navigate on a reliable basis. In addition, the impact of the flood flows would have made maintaining a stable channel for navigation difficult.

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[91] Eleventh Annual Report of the United States Geological Survey to the Secretary of the Interior, 1889-1890, Part II-Irrigation (Washington D.C.: U.S. Government Printing Office, 1891), p. 58 [LRA Box/File: 9/9].

The Twelfth Annual Report of the U.S. Geological Survey contained similar descriptions of Arizona's rivers, including the Salt. Noting that many of Arizona's streams (including the tributaries of the Gila) fluctuated greatly, the author of the Report wrote that those rivers "at times [are] subject to sudden floods, especially during summer rains, when they often sweep out bridges, dams, and canal head works, while at other times they may diminish until the water almost disappears." Specifically with regard to the Salt River, the Report observed it was subject to

> short, sudden floods carrying considerable volume of water for a few hours, and at longer intervals, perhaps of three or five years, there are enormous floods, whose violence and duration is phenomenal. These latter, however, are rather to be feared than to be depended upon as beneficial.

The Report added further details about the nature of these floods along the Salt. The Report's author stated that from interviews with local citizens, the

> irregular character and extraordinary fluctuations of the stream are clearly brought out. The most notable feature is the great flood of February 21, 1890, when, according to Mr. Davidson's [engineer of the Arizona Canal Company] computations, the discharge increased suddenly from 1,000 second-feet to over 143,000 second-feet. This, however, is eclipsed by the flood of February 18 to 25, 1891. . . . On February 17 the mean discharge was 835 second-feet, increasing the next day to 154,000 second-feet, and on the 20th only 69,100, and on the 22d 14,890. This was followed by a second swell greater than the first, the flood increasing until on the 24th a maximum of 300,000 second-feet was reached. This subsided almost as rapidly as it came, so that by the second day after the river was carrying less than 15,000 second-feet. . . . The Arizona Canal Company's weir across the Salt River was damaged, a portion of the canal washed out, and the channel of the stream so altered that computations of daily discharge could no longer be made without new data.

These vivid descriptions of flooding and channel changes depict the Salt as a river whose flow and course were entirely unreliable for regular navigation.[92]

The Thirteenth Annual Report of the U.S. Geological Survey, published in 1893, discussed western rivers having periodic (or regular) oscillations in flows. The only such stream in Arizona, according to the Report, was the Colorado. Regarding rivers with nonperiodic oscillations (which presumably applied to all the other rivers in Arizona) the Report noted:

> The nonperiodic oscillations give rise to the greatest concern on the part of the engineer and the irrigator, for while he can be reasonably certain regarding the character of the periodic variation, he must at all times be on the watch for extraordinary occurrences for which there are no analogies. The rivers and lakes may for a time increase in volume or may apparently shrink so greatly as to cause serious alarm as to their permanence.

Confirming the nonperiodic oscillation nature of the Salt River, the Report added that

> [t]he Salt river is an extremely difficult stream from which to divert a canal, owing to the irregularity of its discharge. . . . As a consequence of this erratic discharge the river bed itself is very wide and a long and expensive diversion weir is required in order to procure stability and permanence.

The "erratic discharge" was further clarified in the Report:

> the river is subject to some of the greatest floods which have occurred in the west, due to cloudbursts falling over certain portions of the basin. In the early spring of 1890 an extraordinary flood occurred in the Salt river, increasing its discharge for a short period of time to 141,000 second-feet.

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[92] Twelfth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1890-91, Part II-Irrigation (Washington D.C.: U.S. Government Printing Office, 1891), pp. 298, 312-313 [LRA Box/File: 9/9].

As the Report indicated, these frequent and violent floods demonstrate the river's unreliable character and show that navigation on a regular basis would have been difficult at best.[93]

U.S. Geological Survey Water Supply Papers: Aside from its annual reports, the U.S. Geological Survey also published a series of research treatises known as "Water Supply Papers." While these studies dealt with specific topics and geographic areas, some examined subjects which shed light on the nature of the Salt River. For instance, Arthur P. Davis, author of Water Supply Paper No. 2, Irrigation Near Phoenix, Arizona (1897), characterized the "streams of this country" (Arizona) as "extremely irregular in character, fluctuating at times with great rapidity, floods coming down without warning, and disappearing in the course of a few hours." Davis added that "the gravel and bowlders [sic] accumulate during the lesser floods all along the course of the stream, covering the dam sites, and form long lines of barren wash." Not only were these characteristics atypical of a navigable body of water, but so too were the presence of diversion dams for irrigation canals along the Salt River. The principal diversion dam when the report was drafted in 1897 was the Arizona, which Davis observed "extends diagonally across the river in a northeasterly direction from a

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[93] Thirteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1891-92, Part III-Irrigation (Washington D.C.: U.S. Government Printing Office, 1893), pp. 18, 95-96, 175-176 [LRA Box/File: 9/9].

rock projecting into the stream from the right bank to a rock on the left bank."[94]

Six years after the Geological Survey issued Irrigation Near Phoenix, Arizona, the agency published Water Supply Paper No. 73, Water Storage on Salt River, Arizona (1903). Although focussing principally on the proposed construction of what eventually became known as Roosevelt Dam about sixty miles above the present location of Granite Reef Dam, Water Supply Paper No. 73 (also written by Arthur P. Davis) once again noted that the Salt River was "more or less torrential in character, the combined flow [of the Salt and Verde rivers] dwindling at times to about 100 cubic feet per second, and at other times reaching a volume more than one hundred times as great."[95]

In 1905 the U.S. Geological Survey published Water Supply Paper No. 136, Underground Waters of Salt River Valley, Arizona. As in earlier Water Supply Papers, the report on groundwater contained numerous descriptions of the Salt River. Willis Thomas Lee, who wrote the paper, made it clear that the Salt River had changed channels on many occasions. For example, in discussing the region around present-day Mesa, Arizona, Lee noted that

> [c]hanges in the river's course over an aggrading area are the rule rather than the exception. Old channels,

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[94] Arthur P. Davis, Irrigation Near Phoenix, Arizona U.S. Geological Survey Water Supply Paper No. 2 (Washington D.C.: U.S. Government Printing Office, 1897), pp. 9, 11, 50-51 [LRA Box/File: 8/14].

[95] Arthur P. Davis, Water Storage On Salt River, Arizona, U.S. Geological Survey Water Supply Paper No. 73 (Washington D.C.: U.S. Government Printing Office, 1903), p. 9 [LRA Box/File: 8/16].

> therefore, which do not correspond with the present river's course are to be expected in the valley fill. . . . The old debris-filled channels may be narrow like the present channel of the Salt River near the upper end of the valley, or may be miles in width according to circumstances. . . . As the river swung from side to side of the valley, gravel and bowlder [sic] beds were always left in its wake; furthermore -- and this is the key to the problem -- wherever a bowlder [sic] bed was formed a bowlder [sic] train filling the old channel connected and probably still connects this bed with the mouth of Salt River Canyon, whence the water, together with its debris, issued then as it does now.

In addition to constantly shifting channels and hazardous obstacles, the river Lee examined was not regular in flow. In his discussion of "The River and The Underflow," he stated that

> [t]here is a permanent water supply in [the river] from the head of the valley to the Tempe canal, north of Mesa. Below the head-gates of the Tempe canal a short space occurs in which the river is practically dry for the greater part of the year. Farther downstream underground water returns to the river bed; that is, the river cuts beneath the water table and the underflow returns in part, making a surface flow of something like 35 second-feet. . . . North of Mesa the river bed is at the same elevation as the water table, while at Tempe the river bed is below the water table. This explains the return of the underflow to the surface, making a perennial stream at Tempe, while the river bed both east and west of Tempe is dry.

The author further described the river as "pass[ing] through a narrow channel between Tempe Butte and the conglomerate hills to the north." All of these descriptions point to a non-navigable stream. The shifting channels, the existence of boulder beds in the channel, the presence and then disappearance of water in the bed, and the narrowness of the channel in some locations are strong

indications that the Salt River could not be relied upon for transportation purposes.[96]

Unpublished Records of the U.S. Geological Survey: Aside from the annual reports and water supply papers created by the Geological Survey, the agency also generated other documents shedding light on the nature of the Salt River prior to and at the time of Arizona statehood. In 1905 Sheldon K. Baker wrote "Ground Waters of the Salt River Valley" for the Geological Survey, an unpublished study that contained a considerable amount of descriptive material regarding the Salt River. For example, after noting the course of the stream and the nature of the Salt River Valley, Baker's report stated:

> About a mile below the confluence of Salt and Verde rivers and the same distance east of Mt. McDowell, a large part, and in dry seasons all, of the water of the river is diverted into the Arizona Canal. A portion of this water is returned to the channel, to be taken out a short distance below by the Consolidated, Utah and Tempe Canals. From the head of the Tempe Canal the river channel is dry the greater portion of the time for a distance of about five miles, when it emerges, flowing for a short distance and sinking, to emerge again a little to the east of Tempe. After flowing about two miles the water is diverted into the joint head of the Salt River Valley and Maricopa Canals. Below this point the channel is dry except during flood seasons, to a point about three miles southwest from Phoenix, where the river again emerges, to flow to its confluence with the Gila.

Written only seven years before statehood, Baker's description of the Salt River makes it obvious that navigation on that stream

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[96] Willis T. Lee, Underground Waters Of Salt River Valley, Arizona, U.S. Geological Survey Water Supply Paper No. 136 (Washington D.C.: U.S. Government Printing Office, 1905), pp. 119, 121-123, 130 [LRA Box/File: 8/11].

would have been difficult, if not impossible, on a reliable basis due to the frequent dry intervals.[97]

In another unpublished report prepared for the U.S. Geological Survey, E.C. Murphy discussed potential hydroelectric power sites within Arizona just three years after it became a state. His report was done to conform with provisions of the act admitting Arizona to the Union. That law prevented the new state from selecting parcels valuable as hydroelectric power sites as part of acreage granted by Congress. Murphy's report was the result of an investigation to locate those lands so the United States could retain them.[98]

Part 3 of Murphy's report covered the Salt River and "smaller tributaries" of the Gila. Murphy wrote that over a twenty-six-year period, the annual runoff of the Salt River had ranged from 153,400 acre-feet to 3,226,000 acre-feet, indicating a highly variable stream. He also observed that while the mean flow was 770,500 acre-feet, its fluctuation was so great that in some years the flow had been as little as one-fifth the mean. In others, the flow was more than four times the mean. Even though the Salt at times carried substantial volume of water, Murphy nevertheless concluded

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[97] Sheldon K. Baker, "Ground Waters of Salt River Valley," 1905, unpublished report in file 559, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/4].

[98] Each main part to Murphy's report was re-paginated beginning with page one. Therefore, all citations to his report will include the section as well as page number. See E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Introduction, pp. 4-5, Salt River Project Archives, Phoenix, Arizona [LRA Box/File: 6/4].

that between Granite Reef Dam and the mouth of the Salt there were "no power possibilities on this part of the stream as all the water is diverted into the canals during a large part of the year."[99]

RECORDS OF THE U.S. RECLAMATION SERVICE: Following Congress's enactment of the 1902 Reclamation Act, many of the water resource duties formerly carried out by the hydrographic branch of the U.S. Geological Survey were transferred to the young U.S. Reclamation Service. Under the terms of the new law, the new agency also was charged with the responsibility of selecting reservoir locations throughout the American West and constructing dams and irrigation canals at those sites. It was under this latter mandate that the agency planned the Salt River Project, including the construction of Roosevelt Dam and Granite Reef Dam. In addition, the Reclamation Service also purchased and renovated some of the existing irrigation canals in the Phoenix area as well as built new ones. Since much of this work took place between 1904 (when construction work began) and 1911 (when Roosevelt Dam was completed), the Reclamation Service's records are extremely useful for determining the nature of the Salt River around the time of Arizona's statehood.

U.S. Reclamation Service Annual Reports: Like the Geological Survey, the Reclamation Service issued annual reports describing its activities, and these contain valuable descriptions of the Salt River. The First Annual Report of the Reclamation Service (1903)

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[99] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Part 3, pp. 2, 8, Salt River Project Archives, Phoenix, Arizona [LRA Box/File: 6/4].

noted that irrigation in the drainage basin of the Gila and Salt rivers had already been developed to a point that there was insufficient water for the all farmlands, and the report added that "[t]he situation in this respect, while not peculiar, is most extreme as regards the entire West, the fluctuations of flow of the rivers being most marked and the effect upon the population most disastrous." Moreover, the report continued that

> [t]he sources from which water may be obtained for reclamation of the arid lands in Arizona are, taken as a whole, the most erratic or irregular in the entire country. There are comparatively few rivers which flow throughout the year. Most of the tributaries of Gila River, beginning in the mountains as perennial streams, lose their waters in the broad, open valleys.

Because of these characteristics, the First Annual Report of the Reclamation Service indicated that the Reclamation Service was planning the Salt River Project to store the Salt River's irregular flows behind a giant masonry dam at the confluence of the Salt and Tonto Creek. While the report's description of the variable flows of the Salt helped explain why storage of the stream's supplies was necessary, it gave no indication that navigation interests would be adversely affected by the Salt River Project's storage reservoir, its diversion dam, or the removal from the stream of large quantities of water for irrigation.[100]

By the time the Third Annual Report of the Reclamation Service (1905) was published, work on the Salt River Project was well underway, and progress was detailed in the report. In reviewing

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[100] First Annual Report of the Reclamation Service, from June 17 to December 1, 1902 (Washington D.C.: U.S. Government Printing Office, 1903), pp. 75-76 [LRA Box/File: 9/1].

problems, the report indicated that studies were being undertaken to determine the sources of salt in the river and to lessen the impact of that substance on irrigation. The isolated location of Roosevelt Dam had also caused difficulties in getting supplies to the construction site. In the report, Reclamation Service Supervising Engineer Louis C. Hill observed that "[f]ew reservoirs have been constructed in locations where the natural conditions are so extremely favorable and transportation facilities so meager." Hill added that the construction of a road from Phoenix to the dam site had reduced rates for hauling supplies and that "[i]ndirectly, it has opened up a country hitherto absolutely inaccessible." While issues such as salt and the difficulties of carrying supplies to the Roosevelt Dam site were thoroughly addressed in the Third Annual Report of the Reclamation Service, this synopsis of operations gave no indication that any problems existed due to the project's impact on the Salt River's navigability. Indeed, the building of the road from Phoenix to Roosevelt underscored the inability of the river to carry supplies or people.[101]

The Fifth Annual Report of the Reclamation Service (1906) carried a discussion of the beginning of construction on Granite Reef Dam, noting that the "dam will ultimately divert all the water used on both sides of the river and will save the heavy maintenance charges of the six temporary structures now used." There was no suggestion that Granite Reef Dam or any of the diversion dams it

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[101] Third Annual Report of the Reclamation Service, 1903-4 (Washington D.C.: U.S. Government Printing Office, 1905), pp. 140-141 [LRA Box/File: 9/1].

would replace might cause any difficulty for navigation interests on the Salt River.[102]

The Seventh Annual Report of the Reclamation Service (1908) contained more discussion of diversion dams along the Salt River, again with no indication that these structures in any way hampered navigation on the stream. The report pointed out that before Granite Reef Dam had been completed, other

> dams by which water was diverted from the river were constructed of brush and rock and were consequently either very seriously damaged or completely carried away by almost every flood . . . [and] [d]uring the period of operation by the Reclamation Service, portions of the Arizona dam have been replaced six times and the joint head dam has been completely replaced once.

Not only do these statements underscore the unpredictable nature of the Salt River, but the fact that the dams were constantly being rebuilt -- without opposition by navigation interests -- points to a river that was not useful for carrying commerce.[103]

Unpublished Records of the U.S. Reclamation Service: Like the annual reports of the U.S. Reclamation Service, the agency's unpublished documents further depicted the Salt River as highly erratic and not used for commercial navigation. While the

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[102] Fifth Annual Report of the Reclamation Service, 1906 (Washington D.C.: U.S. Government Printing Office, 1906), p. 90 [LRA Box/File: 9/1].

[103] Seventh Annual Report of the Reclamation Service, 1907-1908 (Washington D.C.: U.S. Government Printing Office, 1908), pp. 53-54 [LRA Box/File: 9/1]. For similar discussions about diversion dams and floods on the Salt River see also the Ninth Annual Report of the Reclamation Service, 1909-1910 (Washington D.C.: U.S. Government Printing Office, 1911), p. 59 [LRA Box/File: 9/1]. Subsequent Reclamation Service annual reports carried less descriptive material on the nature of the Salt River, probably because the Salt River Project was nearly completion.

Reclamation Service's files contain thousands of documents describing the Salt River and the construction of the Salt River Project (none of which indicate that the river was a reliable means of navigation), representative examples are provided here.

On September 4, 1902, Judge Joseph H. Kibbey (who had written the earliest water rights adjudication decision involving the Salt River -- M. Wormser, et al. v. The Salt River Valley Canal Company (1892) -- see page 177 below for a discussion of this case) submitted to a committee of concerned Phoenix-area citizens a report entitled "Suggestions of Judge Jos. H. Kibbey for Plan to Secure Government Aid for Construction of Tonto Reservoir." Drafted only three months after Congress had approved the Reclamation Act, Kibbey's report examined the major problems associated with obtaining federal government assistance under the terms of the new law for building what eventually became known as Roosevelt Dam. Among the points Kibbey discussed were how to resolve questions of water rights, how water users should organize themselves to deal with the Reclamation Service, who would own and operate the canal systems, how repayments for construction would be handled, and a multitude of other concerns. Despite the report's comprehensive nature, Judge Kibbey -- whose expertise in Salt River matters was clear by his ruling in the Wormser case -- gave no indication that addressing the needs of commercial navigation

interests would be necessary if the dam and other related structures were built.[104]

The efforts by Kibbey and other concerned Phoenix citizens paid off, and shortly after Kibbey had submitted his paper, the Reclamation Service approved the construction of what eventually became known as the Salt River Project. On May 4, 1903, as initial planning for Roosevelt Dam and other project features was taking place, Reclamation Service Consulting Engineer George F. Wisner wrote to Chief Engineer Frederick H. Newell regarding problems that would have to be addressed as planning went forward. Wisner observed that one difficulty was that the reservoir would gradually fill with silt. Seeing that one solution to this problem was to raise the dam, Wisner cautioned against building it too tall because of insufficient water to fill the reservoir every year. Wisner also noted that another issue the government might face in building the dam was liability for damages during the construction phase. Nevertheless, Wisner made no mention of any problems that might arise by interfering with the navigability of the Salt River.[105]

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[104] Joseph H. Kibbey, "Suggestions of Judge Jos. H. Kibbey for Plan to Secure Government Aid for Construction of Tonto Reservoir Submitted September 4, 1902, to Conference Committee at Phoenix, Arizona," file 27, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/10].

[105] George F. Wisner to F.H. Newell, May 4, 1903, in "Salt River Project, Consulting Engineers Reports, January 1, 1913 -- December 31, 1913," General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group
(continued...)

Also indicating that the Salt River was not used for commercial navigation was a September 3, 1905, letter written by Louis Hill to Arthur P. Davis. Describing progress on the construction of Roosevelt Dam, Hill stated that freighting operations along the road from Phoenix to Roosevelt (a portion of which was below Granite Reef Dam) were already taking place:

> It may interest you to know something of the traffic passing over the Roosevelt Road even now, before the contractor has fairly begun hauling in his material and before the oil outfit has begun to deliver even one-half the amount which is demanded from them when we are running at full blast. The amount of freight hauled daily and delivered to the United States, . . . to the people living in Roosevelt, those up the Salt River Valley to the Tonto Valley and further on toward Holbrook demands a daily payment to the freighters of at least $750. A low estimate of the value of this freight is $250,000 a month. It hardly seems possible that that much material and provision is used in the district tributary to the road.[106]

With so much freight being hauled from Phoenix to the dam location by wagon, government engineers surely would have taken advantage of the lower cost of water transportation had the Salt River been navigable.

Another unpublished Reclamation Service document revealing the nature of the Salt River around the time Roosevelt Dam was being built is a 1905 report by Gerard H. Matthes. Entitled "Recent

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[105](...continued)
115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/8].

[106] Louis C. Hill to A.P. Davis, Sept. 3, 1905, in "Salt River Project, Consulting Engineers Reports, January 1, 1913 -- December 31, 1913," General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/8].

Conditions in Salt River Valley, Arizona," the report described the "unusual meteorological conditions which have prevailed throughout the United States during the early part of the present year." In particular, Matthes reviewed how those weather conditions had affected the Salt River Valley. Matthes noted that there had been unusually high precipitation in the winter and spring months of 1903, and while that had been an advantage to cattle ranchers on high ground, it had caused serious flooding throughout Arizona, especially in the Salt River Valley. Matthes wrote that

> in the populated districts of Arizona, and in the Salt River Valley more in particular, the excessive precipitation has been the cause of washouts along the railroads, wagonroads, canals, ditches, telegraph and telephone lines, to an extent unparalleled in the history of the valley.

Matthes further observed that the flooding had repeatedly destroyed railroad lines and bridges in and out of Phoenix, and for a time there had been no available bridge spanning the Salt "for many hundred miles either up or down the river[.]" Matthes pointed out that there had been considerable damage to the irrigation systems in the Salt Valley and that the Salt River bed had shifted due to the flooding:

> The ranches of Salt River Valley sustained damage in many different ways; one after another of the diversion dams maintained across Salt River by the various irrigation enterprises were washed out, and when the waters finally commenced to subside the owners found themselves confronted with difficult problems regarding the reconstruction of these dams the majority of which had been of a more or less temporary character. All along the river sweeping changes occurred in the river bed, and in more than one instance the new channel was found to be located a long distance away from the old canal head. The continued high water, moreover, rendered it impracticable to reconstruct these dams in season to turn

> irrigation water in the ditches for the spring irrigation, and at many points in the valley irrigators were left without water for a considerable period. Fortunately for them, however, the copious rains which had previously soaked the soil proved to be the salvation of many a crop. . . . One of the most serious calamities to the people of Salt River Valley occurred on April 13, when a high flood destroyed the timber dam of the Arizona Water Company, commonly known as the Arizona dam. This structure practically controlled all the irrigation water used on the north side of the river, and its loss was a serious blow -- more especially to the orchards in the northern part of the valley. The older canals, known as the Salt River Valley, Maricopa and Grand canals, which had been supplied with water by the Arizona Water Company, made immediate preparations to restore their former headgates and were soon able to supply the ranches which were situated under them with irrigating water. The Arizona Water Company is also preparing to rebuild its dam. . . . The protracted floods on Salt River in addition to destroying the works of man, did incalculable damage to lands along the river, through the shifting of the river bed and the caving of the banks. At numerous points along the river ravages of this nature assumed large proportions -- ranches of large acreage being cut down to small holdings, and in some cases entire ranches disappeared little by little, inclusive of barns and buildings, leaving the owners destitute. At Tempe the river cut into the banks east of the Tempe Buttes which protected the town on the north side of the river, carrying away many acres of valuable farm lands. Considerable apprehension has been entertained by the citizens of that locality, who fear that the river will form a new channel to the south of the Buttes and through the heart of the community.

Despite the detailed description of the damages wrought by the flooding and the difficulties local residents faced in rebuilding diversion dams, bridges, buildings, and other structures, Matthes made no mention of any impact on navigation on the Salt, either by the rebuilding of irrigation works or by the flooding and massive channel changes.[107]

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[107] Gerard H. Matthes, "Recent Conditions in Salt River Valley, Arizona," Dec. 1905, in "Salt River Project, Consulting Engineers (continued...)

Yet another example of the Reclamation Service expressing its concern over issues that might affect the construction of the Salt River Project can be seen in the agency's interest in Patrick T. Hurley v. Charles F. Abbott, et al., a lawsuit commenced in 1905 to adjudicate the water rights of all irrigators in the Salt River Valley. (This case is discussed in greater detail beginning on page 180 below.) As the litigation moved forward, U.S. government officials were quite anxious about the lawsuit's conclusion because the outcome could have considerable impact on water to be stored at Roosevelt Reservoir. Demonstrating the government's worries, on February 28, 1907, Morris Bien, acting chief engineer of the U.S. Reclamation Service and an attorney for that agency, wrote Benjamin A. Fowler, president of the Salt River Valley Water Users' Association. Bien told Fowler that the "importance of this matter [Hurley v. Abbott] is manifest and is undoubtedly appreciated by the water users association and many of the people in the valley." Bien asked Fowler for the status of the litigation, and he added that the "matter is of extreme importance to the Reclamation Service as the progress in this case must guide its future policy." Observing that the "Government must be protected against any claims to the use of water stored in the Roosevelt Reservoir[,]" Bien opined that it might be necessary to keep the gates of Roosevelt

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[107](...continued)
Reports, January 1, 1913 -- December 31, 1913," General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/8].

Dam open and not store water until the court case was resolved. While Bien, who was a Reclamation Service attorney, was clearly worried about claims for water that might be stored at Roosevelt, he gave no indication that any of those claims might be to keep the Salt River navigable.[108]

Additional evidence of the Reclamation Service's concern with the potential outcome of Hurley v. Abbott can be seen in a June 11, 1907, letter from Louis Hill to the director of the agency. Hill noted that ever since the suit had been filed, there had been considerable discussion around the Salt River Valley as to whether the court would have full authority to decide the rights of all concerned parties in relation to the Salt River's supplies. Hill explained that many water users believed that the litigation only would decide the rights of the plaintiff, Patrick Hurley, in relation to those of the named defendants, and therefore many of the water users were not bothering to appear in court or participate in any way. Hill reported that the presiding judge in the case, Edward Kent, viewed this situation with regret because it might result in some irrigators losing their water supplies by default. While Judge Kent had expressed his concern that all parties' interests in the Salt River needed to be resolved, he gave

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[108] Morris Bien to B.A. Fowler, Feb. 28, 1907, file 118, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/14].

no indication (nor did the Reclamation Service) that any of those concerned parties were commercial navigation interests.[109]

The issue of developing hydroelectric power at Roosevelt Dam and elsewhere also demonstrated a lack of navigability of the Salt River. In 1911 as construction on Roosevelt Dam and the Salt River Project neared completion, controversy arose over whether hydroelectric power should be developed at the dam and at drops in the canals, and if so, how much. Evidently, proponents of a permanent source of hydroelectric power believed the income from this energy could be used to offset the costs of the dam and project. Nevertheless, the chief electrical engineer for the Reclamation Service at the Salt River Project, O.H. Ensign, urged restraint in the creation of more power than just the amount necessary for pumping purposes. Ensign told Reclamation Service Director Frederick Newell that generating constant hydroelectric power through continuous releases of water might not be possible if sufficient water for irrigation purposes late in the summer months was to be kept at the reservoir. Ensign, however, gave no indication that navigational interests might support steadier flows of water in the Salt River.[110]

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[109] Louis C. Hill to the Director, U.S. Reclamation Service, June 11, 1907, file 118, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/14].

[110] O.H. Ensign to the Director, U.S. Reclamation Service, Feb. 7, 1911, in "Salt River Project, Consulting Engineer Reports, January 1, 1907 -- December 31, 1912," General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of

(continued...)

One final example of Reclamation Service unpublished documents illustrating that the agency did not consider the Salt River to be navigable is the 1916 report, "Final History, Salt River Project, Arizona." This synopsis covered virtually all aspects of the history of the Salt River Project, and it included descriptions of private Salt River Valley canals in existence prior to the construction of the federal project, roads to Roosevelt Reservoir, and Granite Reef Dam. (See the 1902 map reproduced on page 155 of this report for the location of some of the private canals.)

In relation to the private ditches, the report included discussion of the Swilling Ditch (1867), the Maricopa Canal (a branch of the Swilling Ditch, 1868), the Tempe Canal (1870), the San Francisco (or Wormser) Canal (1871), the Utah Canal (1877), the Grand Canal (1878), the Mesa Canal (1879), the Arizona Canal (1883-1885), the Cross-Cut Canal (1889), and the Highland Canal (1888). Although these canals used a considerable portion of the entire flow of the Salt River, the "Final History" made no mention of any objections by parties who might have been concerned with the commercial navigability of the Salt River. The report also indicated that most of these canals built their own diversion dams on the river (although some of them were combined over the years), and while the dams were temporary (except for the Arizona Canal's diversion dam), there apparently were no objections to any

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[110](...continued)
Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/8].

interference with the navigability of the Salt River. As the report explained,

> [t]he torrential character of Salt River, together with its tendency to shift its channel to avoid any obstruction, has made the construction of diversion dams [such as the Arizona Dam] of stability a matter of great difficulty. . . . The other dams on the river were temporary affairs if [sic -- of] brush and rock that had usually been swept away more or less completely by the periodic floods that occur semi-annually with great regularity. At such times it was rarely ever possible to repair or reconstruct the dam till after the floods had subsided. Then little water remained in the river that could be utilized for irrigation. When the dam was intact there was often a meager water supply, and when there was an ample supply of water in the river the dams were often out, and in consequence the valley was generally in a chronic state of water famine. But notwithstanding this condition of uncertainty in regard to the water supply, the agricultural development of the valley has been little less than marvelous.

Under the section of this report dealing with roads, the report noted that the "inaccessibility of the Roosevelt Reservoir" had forced the construction of roads to carry freight and lumber to the dam construction site. One of these, the Mesa-Roosevelt road, had been constructed beginning in 1903, and it had reduced freight expenses considerably by not having to haul everything via Globe, Arizona, and then to the reservoir site. The report noted that building the road had been exceptionally difficult due to the steep mountainous terrain, and in some cases workers had to use lifelines to carry on work. Moreover, once the road had been completed in 1905, it had washed out frequently, especially in the canyon just below Roosevelt Dam. Nevertheless, despite these extreme difficulties in hauling materials from Phoenix to the dam locale,

the report made no indication that the river might have been used as an alternative means of transportation.

The report also discussed Granite Reef Dam, noting that it took the place of an older timber crib dam that had diverted the Salt River's waters into the Arizona Canal. Granite Reef Dam was built about two and a quarter miles above the older structure beginning in 1905, and it was completed in 1908. The report stated that

> [a]ll material and supplies came by way of Mesa, the nearest railroad connection, and were hauled by wagon from that point to the dam. . . . A daily stage from Mesa carried mail and passengers.[111]

Again, as had been the case with carrying supplies to Roosevelt, the Reclamation Service apparently never considered using the river to transport goods or people to Granite Reef Dam (see the map reproduced on page 155 of this report for the location of some of the private canals).

RECORDS OF THE U.S. DEPARTMENT OF AGRICULTURE: Long before Congress passed the Reclamation Act in 1902, the federal government had been assisting farmers in the West through the U.S. Department of Agriculture. That agency's Division of Soils and the Office of Experiment Stations generated a variety of published and unpublished records characterizing the nature of the Salt River, a few typical examples of which will be discussed here.

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[111] "Salt River Project, Final History (to 1916)," Engineering and Research Center Project Histories, 1911-1991, Box 142, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 12/6].

Published Records of the U.S. Department of Agriculture: One of the earliest Department of Agriculture documents to be published about the Salt River region was Thomas H. Means's Soil Survey in the Salt River Valley, Arizona, which appeared as a result of field operations of the Division of Soils in 1900. Dealing principally with soils and geology, the report nevertheless contained useful depictions of the Salt River. For example, in describing the various irrigation canals in the Phoenix area Means wrote regarding the Salt that the "water of the river, which sinks into its porous bed below McDowells Butte, is forced to the surface by the bed rock north of Tempe Butte, so that at Tempe there is always water in the river." Means added more detail about the Salt in his discussion of groundwater:

> Water is found everywhere in the gravels beneath the valley, the depth and amount of matter in solution varying greatly. The level of standing water and its character have no doubt been much changed during the years in which irrigation has been practiced. Little is known of the condition existing before irrigation, except that the water was deeper than now. . . . All the streams are dry most of the year, except in places where the bed rock is near the surface of the ground. For example, the Salt River at McDowells Butte and for 5 or 6 miles below always contains water, but immediately northwest from Mesa the stream bed is dry during part of the year. At Tempe the water again rises and for a mile the river is above ground. South of Phoenix the stream bed is generally dry, but about 8 miles southwest of Phoenix the water again rises, and from that point the Salt and Gila rivers are above ground for 50 miles or more. The constant flow of the streams when above ground clearly shows that there is a constant flow under the ground through the gravels and sands. Moreover, the increase in underflow indicates that a portion of the water which is applied by irrigation returns to the streams from which it is taken. The irrigation of the great plain around Phoenix will undoubtedly increase the flow of the Salt and Gila rivers near the initial amount. Such an increase has already taken place, but exactly how

> much can not be said. Continued irrigation should increase the flow even more, and when all the land below the Arizona Canal is irrigated the flow will be greater than it is now. The subflow is perhaps the most permanent source of irrigation water in the valley. The gravels and sands of the valley act as a storage reservoir, and the resistance to the flow of water through this material acts as a regulator upon the flow.[112]

While Means noted that water flowed in the Salt at various locations, his report did not contradict other observations about the Salt's erratic nature, its changing bed, and the frequency of its floods. In fact, other Department of Agriculture documents underscored these points. For instance, W.H. Code's Report of Irrigation Investigations for 1900, Office of Experiment Stations, Irrigation in the Salt River Valley contained a wealth of information about the unreliable nature of the Salt River's flows. In this report, Code wrote that

> [p]revious to the year 1885 the water of the Salt River was allowed to find its way down a wide sandy river bed to the various canal heads situated along its banks for a distance of about 20 miles. . . . [Before the construction of the Consolidated Canal], the water of the Tempe Canal was allowed to flow down the river, passing through a wide sandy section of the channel some 7 miles in length. This portion of the river bed seemed to absorb water like a sponge, and frequent measurements by different engineers determined the fact that in the summer season especially there was a great waste of water between the dam of the Tempe Canal and that of the Consolidated system located about 7.5 miles up the river. . . . The entire low water supply of the Salt River is taken from the river channel by the time it reaches the head of the Utah Canal. Practically no water passes the Utah dam, and the river bed for several miles is as dry as dust. After following the river channel, however, for a distance of 6 or 7 miles, water again

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[112] Thomas H. Means, Soil Survey in the Salt River Valley, Arizona (Washington, D.C.: U.S. Department of Agriculture, Division of Soils [1901]), pp. 310, 312-313, [LRA Box/File: 11/4].

> appears, and at a distance of 12 miles below the Utah dam, where the return flow is picked up by the jointhead of the Maricopa and Salt canals . . . the flow in ordinary years is found to approximate 60 cubic feet per second. . . . The river bed is again dry below the dam of the Maricopa and Salt canals, but at the head of the Buckeye Canal, some 24 miles farther down the stream, is again found a volume approximating in ordinary summers 150 cubic feet per second.[113]

It is clear from this excerpt that there were in fact long stretches of the river bed which held no water on a regular and consistent basis. Furthermore, when the river did in fact carry water, it often came in the form of destructive floods. Code wrote that such inundations brought

> to the river channel an enormous amount of debris such as brush, limbs, stumps, and whole trees, but creates many canyons and chasms, some of them of dizzy proportions when it is considered that their inception was perhaps due to an innocent appearing cattle trail leading to the river. The products of such erosions are deposited in the river channel to be swept down to this valley with subsequent heavy floods, together with the debris before mentioned, viz, dead limbs, stumps, trees, etc. The latter are a menace to all irrigation structures along the river, while the heavy sand and fine gravel are deposited in the heads of our canals, seriously diminishing their capacities and entailing great expense in subsequent removal.[114]

The following year, the U.S. Department of Agriculture's Report of Irrigation Investigations for 1901 offered similar

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[113] W.H. Code, Report of Irrigation Investigations for 1900, Office of Experiment Stations, Irrigation in the Salt River Valley, U.S. Department of Agriculture Experiment Station Bulletin No. 104 (Washington D.C.: U.S. Government Printing Office, 1902), pp. 86-87, 103-104 [LRA Box/File: 8/11].

[114] W.H. Code, Report of Irrigation Investigations for 1900, Office of Experiment Stations, Irrigation in the Salt River Valley, U.S. Department of Agriculture Experiment Station Bulletin No. 104, (Washington D.C.: U.S. Government Printing Office, 1902), p. 106 [LRA Box/File: 8/11].

characterizations of an unpredictable river. "The amount of water received from these canals," the report stated, "fluctuates very much during the year, varying with the flow of the Salt River from which they receive their water." Additionally, the report confirmed that the Salt flowed largely in response to precipitation: "The summer rains swell the streams and increase the supply of irrigating water temporarily."[115]

Adding further details about the nature of the Salt River is Alfred J. McClatchie's Utilizing Our Water Supply, published by the Office of Experiment Stations in 1902. Although covering water supplies throughout Arizona, the report chiefly dealt with the Salt River. Describing that stream, McClatchie wrote:

> The Salt River, like all streams having a watershed with many steep slopes, is subject to great variations in its flow . . . [and] conditions combine to make a great difference between the winter and the summer flow. After heavy rains in the mountains, especially during the winter, the Salt River is sometimes unfordable for weeks, while during the hot, dry weather of summer it is sometimes reduced to a mere brook, the flow during the winter months of some years being ten to twenty times what it is during some months of the following summer.[116]

McClatchie also noted the impact of diversion dams and irrigation canals on the Salt's flow. Explaining that prior to construction of the Arizona Dam, the river had been diverted by

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[115] W.H. Code, Report of Irrigation Investigations for 1901, Office of Experiment Stations, Irrigation Investigations in the Salt River Valley for 1901, U.S. Department of Agriculture Office of Experiment Station Bulletin No. 119 (Washington D.C.: U.S. Government Printing Office, 1902), pp. 87, 89 [LRA Box/File: 8/11].

[116] Alfred J. McClatchie, Utilizing Our Water Supply (Washington D.C.: U.S. Government Printing Office, 1902), pp. 62-63 [LRA Box/File: 9/7].

several dams scattered along twenty miles of the river, McClatchie stated that

> [a]t the head of the valley is located the Arizona Canal dam, which, during most of the time, intercepts the entire flow of the Salt River, with the exception of a small amount that finds its way under the dam. After carrying the entire volume about four miles along the north side of the river, it turns back into the river channel the portion allotted to the canals on the south side, at a point immediately above the dam of the Consolidated Canal Company.[117]

The significance of this description is that the Arizona Canal's dam, at the time this report was written, diverted the entire flow of the river. McClatchie claimed that there was little if any water in the channel for four miles, and even when some of the water was returned to the bed, it too was diverted by other irrigation company dams. McClatchie made no mention of any objections by navigation interests to the complete diversion of the Salt River's flow.

Unpublished Records of the U.S. Department of Agriculture: Within a year of publishing Utilizing Our Water Supply, McClatchie reiterated many of the points he had made in that document in a letter to Charles D. Walcott, director of the U.S. Geological Survey. Writing on March 30, 1903, McClatchie urged the federal government to help irrigate the Salt River Valley more fully. As one of the active local proponents of having the new U.S. Reclamation Service build what became Roosevelt Dam, McClatchie

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[117] Alfred J. McClatchie, Utilizing Our Water Supply (Washington D.C.: U.S. Government Printing Office, 1902), p. 89, copy in Hancock Family Collection, Box 2, Folder 20, Arizona Historical Foundation, Phoenix, Arizona [LRA Box/File: 9/7].

restated in his letter many of the points made in Utilizing Our Water Supply. In addition, he noted that

> [t]his desirable condition of our valley that I feel would be secured by water storage I desire to see effected by such means and upon such terms as are conducive to the best interests of the farmers, as are in accordance with justice to all concerned, and as are in harmony with the policy and welfare of our government.[118]

While McClatchie sought "justice to all concerned," he gave no indication that the construction of the large dam might pose a problem by interfering with commercial navigation on the Salt.

Walcott, McClatchie observed, had previously indicated that if the government were to build a reservoir, some of the stored waters might have to go to new settlers on the public domain, rather than to existing farmers served by the private canals. McClatchie thought such a plan would be a mistake since considerable time and expense had gone into building those canals, which were capable of taking water to 250,000 acres had there been sufficient supplies to do so (see map on page 155). McClatchie believed any new storage water ought to go to those lands already served by the existing canal system before any went to additional settlers. He added:

> Moreover, the ordinary flow of the river having been already fully appropriated, newly-settled lands would be entitled only to reservoir water, and in the case of the stored supply being exhausted would be wholly deprived of water for which they had contracted with the government. Should such a shortage last an entire season, as past experience indicates is among the possibilities, such

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[118] Alfred J. McClatchie to Charles D. Walcott, March 30, 1903, file 27, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/10].

newly-settled region would be nearly if not completely ruined.[119]

McClatchie further noted that in order to provide sufficient supplies to lands already under ditches, the nature of the Salt River had to be taken into account. As he explained,

> [t]he great fluctuation of our present water-supply must be understood and taken into consideration, in planning for water storage. As shown in the bulletin before referred to [Utilizing Our Water Supply -- see page 150 above for a discussion of this document], the flow during the winter months of some years is ten to twenty times what it is during part of the following summer; and the flow during any one month may be five to fifteen times as great one year as another. The amount diverted and used varies somewhat less than this, the relation of the greatest amount diverted during any one month of the past eight years to the smallest amount diverted being approximately as ten to one, and the greatest difference in the amount diverted during any two months of one calendar year being as five to one. However, the difference in the amounts diverted during two different weeks of the same year may be as great as twenty-five to one. That is, during some summer week a farmer may receive but one twenty-fifth as much water as he had during a week of the previous winter.[120]

The significance of McClatchie's letter to Walcott is three-fold. First, McClatchie made it clear that by 1903 the entire normal flow of the Salt River was diverted by existing irrigation canals. Second, to carry out this massive utilization of the Salt River's supplies, there were many diversion dams situated along the

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[119] Alfred J. McClatchie to Charles D. Walcott, March 30, 1903, file 27, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/10].

[120] Alfred J. McClatchie to Charles D. Walcott, March 30, 1903, file 27, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/10].

stream which would theoretically impede any navigation. Third, the flow of the Salt River varied enormously over time, demonstrating the difficulty of relying on it for navigation even if obstructions had not existed. Given all of these circumstances, McClatchie nevertheless gave no suggestion that navigation interests might be adversely affected by the river's erratic flow, the diversion dams, the complete use of the normal flow to water farmlands or even the potential construction of a new, massive storage reservoir by the U.S. government.

SUMMARY AND CONCLUSIONS REGARDING U.S. GOVERNMENT REPORTS AND OTHER DOCUMENTS: The records of the three federal agencies whose responsibilities were most closely associated with water resource development in the West (the Reclamation Service, the Geological Survey, and the Department of Agriculture) all consistently illustrate that none of the officials in those agencies considered the Salt River to be navigable on a reliable basis. Reports by these agencies -- both published and unpublished -- routinely characterized the stream as varying dramatically in flow, from a mere trickle to wild floods. The accounts also described a river whose channel frequently changed, whose course was blocked by many dams and diversion works, and whose water supplies were fully diverted to supply farming needs. Moreover, the government documents observed that even when water materialized in the river's channel, it frequently disappeared a short distance downstream. Such a stream could hardly be considered navigable.

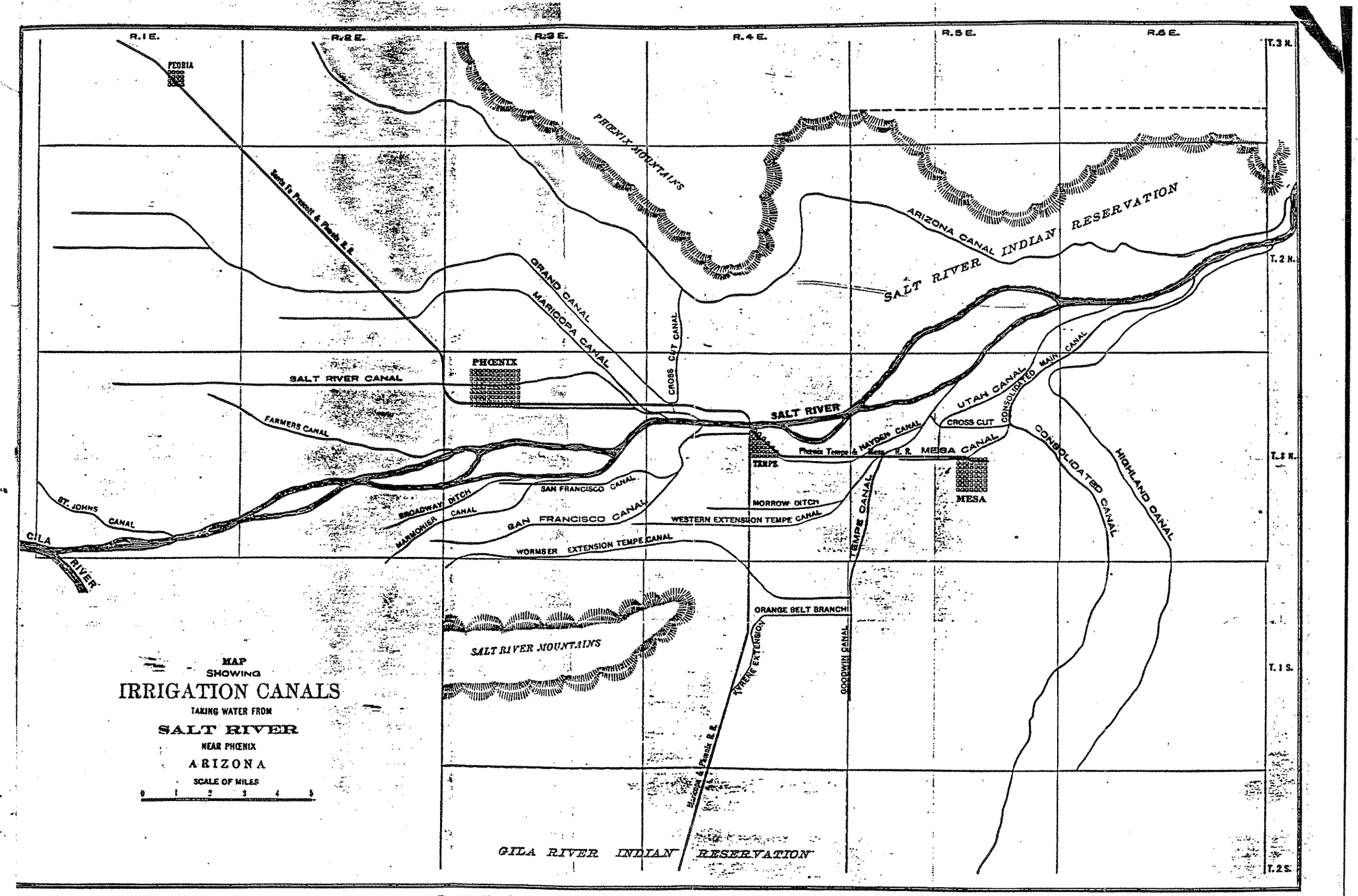

FIG. 16.—Map showing irrigation canals taking water from Salt River, near Phoenix, Ariz.

CHAPTER 4: NEWSPAPER ACCOUNTS OF THE SALT RIVER

BACKGROUND TO NEWSPAPER ACCOUNTS OF THE SALT RIVER: Newspaper reports offer some of the most frequent descriptions of the Salt River in the years leading up to Arizona's statehood in 1912. To understand the significance of press accounts of the Salt, some background information on nineteenth and early twentieth century papers in the American West is necessary. Such newspapers were among their respective communities' biggest boosters, not only due to civic pride, but also to attract settlers to growing towns. Articles in out-of-town papers which provided positive accounts of visits to a particular community were often reprinted verbatim by the latter town's press, and residents who commented on their hamlet's virtues while away received considerable attention by the home-town press if those remarks became known. As enthusiastic promoters of their communities, local papers frequently printed long articles extolling their respective areas' many advantages not only for their own readership, but also for readers in other more distant places, to which copies of the paper would be sent to attract newcomers.

Given the booster nature of the western press, it is not surprising that the Salt River, as the source of irrigation water for the area around Phoenix, was given substantial newspaper space on many occasions and was touted as one of the region's many blessings. Although the river was praised as the source of water for the many farms around Phoenix, accounts of reliable commercial navigation on the stream were conspicuously absent from the long

list of many benefits the Phoenix area had to offer. This does not mean that there were no accounts of boats on the Salt River -- indeed, such stories appeared on a variety of occasions. Nevertheless, the articles that did cover the presence of boating on the Salt River indicate that such uses were infrequent and involved boating as ferry services, as a means of rescue from floods, or as recreation or adventure.

Aside from covering the infrequent attempts at boating on the Salt River, the Phoenix-area press also carried a wide variety of other stories that shed light on the nature of the stream. For the purposes of this report, those accounts -- which are representative of many more like them -- are loosely grouped and discussed under the following two categories (in addition to boating): 1) dams and irrigation, and 2) forms of non-water transportation in the Salt River Valley. There were, of course, many stories about flooding, but that topic has been adequately dealt with elsewhere in this report.

BOATING ON THE SALT RIVER: As noted above, boating on the Salt River took a variety of forms. One of these was boating done for adventure or recreation. Such articles emphasized how unusual and difficult regular and reliable transportation by water would be.

Boating for Adventure or Recreation: On February 17, 1881, the Arizona Gazette reported that two individuals planned to float an eighteen-foot-long flat-bottomed skiff from Phoenix to Yuma via the Salt and Gila rivers. The paper reported that the boat

appeared "very strong and durable, and able to stand pretty severe buffeting."[121] Whether this expedition was carried out or not is unclear, but later the same year the Gazette related that the

> "Yuma or Bust" party which left Phoenix recently for the purpose of exploring the Salt and Gila rivers were seen yesterday, only twelve miles from here, all waiding [sic] in mud and water up to their knees, pulling the boat, and apparently as happy (?) as mudturtles. [Question mark in the original.][122]

A few days later, the Gazette carried a story with greater detail on the adventurers:

> The officers of the "Yuma or Bust" returned on to-day's stage. They report having arrived safely at Yuma six days out from this port. We have advice, however, that the boat reached Gila Bend and "busted." . . . [The crew] endured great hardships, being compelled to wade in the water the greater portion of the time and push the craft ahead of them.[123]

Emphasizing the lack of reliable navigation on the Salt River is an account of other recreational boating that appeared on July 29, 1912, in the Arizona Republican -- just five months after Arizona entered the Union. The paper reported that entrepreneurs had instituted a plan to run boats on the Consolidated and Eastern canals (see map on page 155) to carry passengers to Granite Reef Dam. There, a resort was planned with additional boats to be provided for recreation on the lake behind the dam. The article noted with tongue-in-cheek:

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[121] [No title], Arizona Gazette, Feb. 17, 1881 [LRA Box/File: 5/10].

[122] [No title], Arizona Gazette, Nov. 30, 1881 [LRA Box/File: 5/10].

[123] [No title], Arizona Gazette, Dec. 3, 1881 [LRA Box/File: 5/10].

> Boat riding has almost become a lost art in the Salt River valley, but it is probable that a great many of the younger men will soon be wearing sailor costumes and the ladies will keep pace with the fashion. It is expected that shipping news will eventually be a feature of the local valley papers.

No such shipping news ever developed, and there was no suggestion that similar boating could take place on the Salt River itself.[124]

Ferries and Other Boating on the Salt River: A variety of ferries operated at various locations on the Salt River until bridges made them obsolete. As early as April 1881, the Arizona Gazette reported that the Gila and Salt River Ferry Company had launched a new and bigger boat on the "turbulent waters of the Rio Salinas."[125] Some of the newspaper articles describing ferries, however, also reported that such means of crossing the river could be dangerous. On April 14, 1884, for instance, the Gazette reported that mail being transferred across the Salt River by ferry was lost when the current washed the ferry down the stream and forced a collision with another larger ferry.[126]

As the accident with the mail indicated, the Salt River could be hazardous for boats, especially during times of flood. As an example of this reporting, in early February 1905, the Arizona Republican reported that John Tilzer had drowned while trying to save his family, who lived on an island in the Salt River. Tilzer

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[124] "Late Marine News of Salt River Fleet," Arizona Republican, July 29, 1912 [LRA Box/File: 5/7].

[125] [No title], Arizona Gazette, April 21, 1881 [LRA Box/File: 5/10].

[126] "Mail Lost," Arizona Gazette, April 14, 1884 [LRA Box/File: 5/10].

was attempting to reach his stranded wife and children when the raging torrent capsized his boat after it snagged on a barbed wire fence in the flooded river. Tilzer's family was ultimately saved by rescuers who also used a boat, but the effort was hazardous because, as the Republican noted, "waves were breaking over the summit of it [the boat]." The sheriff, who coordinated the rescue, believed the river was so dangerous that he said he would not undertake a similar venture for $500.[127]

In December 1905, as the U.S. Reclamation Service labored to build the Salt River Project, the Arizona Republican once again reported on difficulties using a boat during high water. Reclamation Service engineers had tried to take advantage of the temporarily high flow of the Salt River by using a boat to inspect various diversion facilities and related works on the river. Nevertheless, the paper reported that the engineers "found the Salt river a poor stream for navigation, . . . and in the voyage of a mile they were shipwrecked twice, though without loss of life or property." The government engineers finally gave up trying to use the river and resumed inspections by horse on shore.[128]

DAMS AND IRRIGATION IN THE SALT RIVER VALLEY: The most obvious use of the Salt River was for irrigation water supplies, and the Phoenix-area press constantly reported on this activity. For example, on June 2, 1888, the Phoenix Herald reprinted an

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[127] "Had Two Warnings," Arizona Republican, Feb. 5, 1905 [LRA Box/File: 5/10].

[128] "The Price Fixed on the Canals," Arizona Republican, Dec. 9, 1905 [LRA Box/File: 5/10].

article from the Indianapolis News. The report noted that C.W. Mills, a resident of Phoenix, had gone to Indiana to attract settlers to Arizona. The Indianapolis paper had printed all Mills's glowing descriptions about Phoenix and the surrounding region. Regarding the Salt River, Mills had told the News that "all farming must be done by irrigation, but the valley is already well supplied by irrigating canals, some of them broad and deep enough to use for boating purposes." Mills made no mention of any boating on the Salt River, however -- something he surely would have done (given his purpose in going to Indiana) had the stream been useful for transporting commerce and people.[129]

In another booster piece regarding irrigation, the Phoenix Daily Herald reported in August 1888 on Phoenix's advantages, including its water supply for farming. The article was a reprint of a story that had run in the Carrolton, Ohio, Chronicle, and the Chronicle story had been a letter from a resident of Phoenix to the newspaper in Ohio bragging about Phoenix's many blessings, including connections with the outside world via the Maricopa and Phoenix Railroad. No mention was made, however, of any water-borne commerce on the Salt River. Instead, the river was described as

> affording more water for irrigation than is found in the counties of San Diego, San Bernardino and Los Angeles in California combined. Twelve irrigating canals, at an approximate cost of one million dollars, have been taken from the Salt river, under which 30,000 acres of land have been reclaimed, and it is only a question of a short time when all the land in the valley will be in a high degree of cultivation.

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[129] "An Arizona Colony," Phoenix Herald, June 2, 1888 [LRA Box/File: 5/1].

The letter then added detailed descriptions of the benefits of the Phoenix area, and the letter's author, J.M. Long, wrote: "In conclusion I desire to say that in all my travels through this western country as secretary of the historian, Hubert Howe Bancroft, no place has impressed me as has this valley." Bancroft, Long's employer, was a historian engaged in writing comprehensive histories of the American West. By virtue of his training by this great historian, Long surely would have noted if the Salt River had been navigable. However, he provided no description of commercial navigation or its possibility on the Salt River.[130]

By the turn of the century, Phoenix-area newspapers began to report on the proposal to construct a dam on the Salt River. Residents had begun to consider building a large storage reservoir on the upper Salt River where the Reclamation Service eventually built Roosevelt Dam. Because Arizona was a territory and the reservoir was to be funded by a bond issue tied to Maricopa County, proponents of the massive reservoir pressed Congress to pass an act allowing the county to make this monetary commitment. The Arizona Republican reported on March 19, 1902, on the debate then taking place over this issue, noting that the size of the bond issue was causing some opposition to the dam's financing. Although opponents of the reservoir scheme fought it on fiscal grounds, there was no

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[130] "A Place Fit for the Gods," Phoenix Daily Herald, Aug. 14, 1888 [LRA Box/File: 5/1].

resistance by parties involved in commercial navigation on the Salt River.[131]

When Congress passed the Reclamation Act in June 1902, citizens around Phoenix shifted their reservoir efforts to seeking to have that facility built under the terms of the new law. The Phoenix press carried a multitude of stories on a near daily basis about the growing effort around Phoenix to have the reservoir at the Tonto Basin built by the federal government. While the newspapers also reported that not all parties agreed on the government's role, the existing resistance was based largely on the unfounded claim that the individuals would lose control of their water rights. None of the opposition, however, stemmed from commercial navigation interests contending that the dam might interfere with their enterprises.[132]

Aside from reports about the main storage reservoir, stories also appeared in the Phoenix press about individual diversions along the Salt. On March 24, 1905, the Arizona Republican reported that a group of settlers near Phoenix was building a wing dam in the Salt River to direct the current away from their farmlands. Although the paper indicated that the dam was successfully changing the course of the river, there was no indication that any navigation interests objected to the dam or the alteration of the

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[131] "South Side Objections," Arizona Republican, March 19, 1902 [LRA Box/File: 5/2]. See also articles appearing in the Republican over the next few months.

[132] "The Reservoir Campaign," Arizona Republican, July 20, 1902 [LRA Box/File: 5/2]. See also articles in the Arizona Gazette, Aug. 1, 2, 3, 5, 9, 10, 1902.

channel.[133] The Republican also reported about a year later that the diversion dam at the Arizona Canal was one of the best in Arizona. Although massive compared to other diversion dams, the article noted that there were apprehensions about the dam's strength in floods. Nevertheless, the report contained no references to the dam's presence based on interfering with navigation on the Salt River.[134]

FORMS OF NON-WATER TRANSPORTATION IN THE SALT RIVER VALLEY: Newspaper articles discussing roads and railroads underscored that commerce was conducted overland and not on the Salt River. For instance, on January 19, 1895, the Phoenix Daily Herald published a lengthy booster article on the advantages of the Phoenix area. Written in a question-and-answer format, the article contained nearly a hundred detailed questions and answers about the city, particularly about irrigation and farming. Significantly, while the answers were designed to attract settlers and contained considerable information about commerce in the area, the discussion regarding transportation noted that there were local streetcars as well as two principal railroads. No mention was made of commerce carried on the Salt River -- a topic that certainly would have warranted comment had the stream been used for transportation.[135]

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[133] "The Current Turned," Arizona Republican, March 24, 1905 [LRA Box/File: 5/10].

[134] "Best Rock Dam on Salt River," Arizona Republican, May 26, 1906 [LRA Box/File: 5/4].

[135] "The Salt River Valley," Phoenix Daily Herald, Jan. 19, 1895 [LRA Box/File: 5/1].

The Salt River's potential use for commerce was also ignored in an Arizona Republican article dated June 26, 1902. In that account, the Republican reported that the Secretary of the Interior would probably order the construction of the San Carlos Reservoir on the Gila River (upstream from the confluence with the Salt) under the terms of the newly-enacted Reclamation Act. The paper added that "the construction of that will be of advantage to Phoenix, since it will result in the development of a considerable agricultural area in Pinal County, which will be brought into connection with this city by the Phoenix and Eastern Railroad." While floating goods down the Gila and then boating them up the Salt also would have been possible had those streams been navigable, the paper completely disregarded this prospect, thus illustrating the difficulty in using those rivers for transportation.[136]

As plans for building Roosevelt Dam (then called Tonto Dam) began to take more solid form, the press carried numerous stories about how freight and people would be carried to the construction site. While some of these stories related specifically to areas above Granite Reef Dam, most dealt with the entire distance of the river from Phoenix to Roosevelt. In mid-August 1903, for example, the Phoenix Enterprise wrote that entrepreneurs were considering building a trolley to the dam location to avoid the lengthy road via Globe to Roosevelt. The paper added that

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[136] [No title], Arizona Republican, June 26, 1902 [LRA Box/File: 5/2].

> [t]he details of this scheme, however, are not yet worked out, but that there will be a trolley line to the reservoir is almost an assured fact. Much of the cost of this line can be saved in the difference between wagon and [trolley] car freight.

Nevertheless, despite the concern with the expense of moving freight, the paper gave no indication that anyone considered using the Salt River itself for transportation.[137]

In addition to a trolley line, entrepreneurs also considered construction of a wagon road from Phoenix to the Roosevelt Dam site. An Arizona Gazette article pointed out that such a road might be impossible due to its cost, but the piece noted that even if the road could not be built, freight to the dam site would not be handled on the Salt River. Instead, it would go via Globe, Arizona:

> The proposed wagon road to Phoenix is not seriously talked of for the reason that it is impracticable. It would cost $150,000, an amount out of all proportion to the benefit that would be derived from it, and the farmers would have to pay for it. Besides, a wagon road from the mouth of Tonto [Creek] to Phoenix available for freighting is impossible. Globe will handle all the freight.

While shipping supplies by road via Globe involved going a considerable distance out of the way, the Gazette article never suggested that using the river might be an alternative.[138]

Regardless of the Gazette's gloomy assessment that a road from Phoenix to the reservoir location was not possible, five days after the article had appeared, the Arizona Republican reported that

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[137] [No title], Enterprise, Aug. 14, 1903 [LRA Box/File: 5/3].

[138] [No title], Arizona Gazette, Aug. 25, 1903 [LRA Box/File: 5/3].

surveys were already underway for such a road. Demonstrating that the Salt River was not considered a viable route for taking goods and equipment to the reservoir site, the newspaper made it clear that the road was for hauling supplies:

> This road of course is designed at present only for the hauling of telephone poles and wire and the supplies for the men engaged in construction work. The telephone line is the most pressing need and is to be rushed to completion as soon as possible. If it shall transpire that the close acquaintance with that route will follow the building of the line proves it to be a better one than any other suggested, or proves that it can with less expenditure of money than on any other be made into a good freight road, it is likely it will be made into a permanent highway and graded for freight handling.[139]

In early September 1903, the Arizona Gazette reported on a discussion by the Reclamation Service's Arthur P. Davis on the need for a good road from Phoenix to the Roosevelt Reservoir site. The article pointed out that while freight could go by road via Globe, it would be considerably more costly than to take freight directly to the reservoir site if a road could be built from Phoenix. Davis stated that he was not sure the Reclamation fund would pay for the road, but he added:

> All things considered we would prefer that the freight came this way. If we could have a road whereby we could make the distance in one day with a buggy and two days with a wagon, it would be a great improvement over the inconvenience we have to endure by going by way of Globe.

The cost in hauling freight to the reservoir site was indeed expensive due to the sheer volume. As Davis explained:

> Fuel oil will be the greatest amount of freight that will have to be handled, in fact, there will be about twice as

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[139] [No title], Arizona Republican, Aug. 30, 1903 [LRA Box/File: 5/3].

> much of this as anything else, to be hauled. It will take about 15,000,000 pounds of oil, and the cost of hauling from Mesa will be about two cents a pound. Then there will be about 100 tons of steel and 200 tons of other material.

The Gazette's report carried no indication that Davis ever contemplated using the Salt River itself to carry these supplies.[140]

Once the road from Phoenix to Roosevelt had been completed, there were many accounts of travellers who made the difficult journey by stage to the dam site. On January 27, 1908, the Arizona Gazette reported on the events of one such stagecoach trip. Noting that the journey took eight hours and covered sixty miles, the article also stated that there was a considerable amount of wagon freighting taking place on the road:

> There are many men and teams engaged in hauling stuff to Roosevelt by wagons. On one trip the stage will meet forty wagons. Four to six horses are generally used and the outfits travel in pairs, the owners or drivers camping together.

There was no suggestion that any freighting was being done on the Salt River, though the article was quite long and detailed about other activities along the river and at Roosevelt.[141]

One final example illustrated the lack of navigability of the Salt River. On August 30, 1908, the Arizona Republican carried an account that a ferry boat to be used on the lake behind Roosevelt

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[140] [No title], Arizona Gazette, Sept. 2, 1903 [LRA Box/File: 5/3]. See also "The Tonto Road," Arizona Republican, March 8, 1904 [LRA Box/File: 5/4].

[141] [No title], Arizona Gazette, Jan. 27, 1908 [LRA Box/File: 5/6].

Dam had arrived by overland transportation in Mesa and was being freighted by wagon to the reservoir:

> A large ferry boat, to be used on the lake at the Roosevelt dam, left Mesa yesterday morning for its destination. W.H. Otterson had a team of twelve horses attached to two large freighting wagons which was used in the transportation of the boat. It has an ample capacity for a team and a wagon, and it is proposed to use this to connect passengers with the Mesa-Roosevelt and Globe stage routes.

Had the Salt River been navigable, presumably there would have been no need to haul the ferry to Roosevelt Dam by wagon.[142]

SUMMARY AND CONCLUSIONS REGARDING NEWSPAPER ACCOUNTS OF THE SALT RIVER: As one of the most dominant features of the topography of the Salt River Valley as well as the source of irrigation water for hundreds of farms in the years leading up to Arizona's statehood, the Salt River constantly figured in news accounts by the Phoenix-area press. These newspaper stories illustrated a river that varied enormously in flow, from completely dry to raging torrents. They also emphasized the crucial importance the stream played to the economic well-being of the region. Nonetheless, despite countless articles detailing nearly every aspect of the Salt River, there is no indication in the press reports that the stream was useful for transportation or that it could have been employed in that manner. Instead, the newspaper articles observed repeatedly that roads and railroads were the principal means of carrying goods and people. In those cases where boats were used on the Salt, the manner in which those stories were written made it

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[142] "Ferry Boat for Roosevelt," Arizona Republican, Aug. 30, 1908 [LRA Box/File: 5/6].

clear that such instances were the exception rather than the rule. Even ferries (which actually were means to avoid the river, not to use it to carry goods and people along its course) found the Salt River unpredictable and occasionally dangerous.

The importance of newspaper accounts **not** showing the Salt River to be regularly navigable is emphasized by the fact that had the stream been useful for transportation on a regular and reliable basis, the booster qualities inherent in late nineteenth and early twentieth century American West newspapers surely would have prompted the Phoenix-area press to bring this attribute of the Salt to the attention of readers far and wide. That the local papers did not deem the river to be navigable on a regular basis, therefore, is doubly significant.

CHAPTER 5: MISCELLANEOUS DOCUMENTS

The following documents, gathered from many different sources, reinforce the evidence found in federal surveys, federal and state patents, other government documents, and newspapers indicating the lack of navigability of the Salt River. Included in this discussion are engineering documents, which often contain historical as well as technical information, accounts of explorations and remembrances, various records of the frequent floods that occurred on the Salt, legislative action and litigation involving the river, and more recent historical studies. This material, which ranges chronologically from 1870 to 1988, supports the findings in other parts of this report that the Salt River was erratic, unreliable, frequently dangerous, and blocked by obstructions such as sand bars, gravel beds, boulders, and diversion dams in many places. These documents are representative of many more illustrating the same conclusions regarding the Salt.

EXPLORATIONS AND REMEMBRANCES: Many explorers travelled in Arizona Territory prior to the beginning of heavy settlement in the 1860s and 1870s. Fortunately, some created journals or remembrances of those expeditions which help determine the historical character of the Salt River. The account of a journey made through Arizona by General George Stoneman, John Huguenot Marion, and others in the autumn of 1870 is a good example. Marion, the author, was born in Louisiana in 1836 or 1837. After moving to Arizona, he became a newspaper man, and in 1870, he

accompanied Stoneman on a trip to Camp Verde on the Verde River. Writing on September 30, 1870, Marion noted that they reached the

> Upper Crossing of Salt river about noon, crossed it and rested near a farmhouse. While approaching the river, we got a fine view of the immense valley in which stands the town of Phoenix, and in which are many of the finest ranches in Arizona. We had friends there whom we would have gone to see but for the fever and ague [chills] which was preying upon us. Salt River, or Rio Salado, as some call it, is, next to the Colorado, the largest stream that flows near or through Arizona. The water was low when our party crossed it, yet it was with some difficulty that we made the trip. The wash, in its bed, and on its banks is made up, principally, of granite and quartz bowlders [sic], which strengthened our belief that the stream passes through mineral bearing regions. . . .

There was no mention of using watercraft on the Salt River here or at any other portion of the trip.[143]

Just two years later, another exploration was undertaken by Lieutenant George M. Wheeler of the U.S. Army Corps of Engineers. This trip was designed to obtain topographical knowledge of Arizona and Nevada, report on the progress of engineer explorations, and to determine the mineral resources, influence of climate, and amounts of woodland, water, and other qualities which might affect settlers. With this information, the area was to be mapped by the Corps of Engineers. Following the expedition, a report was submitted to Congress complete with a daily log of the journey containing many descriptions of the region.

In the diary, three Arizona rivers were mentioned: the Gila, Verde, and Salt. It was only during the segment of the journey that covered the Colorado River, however, that any reference was

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[143] J.M. Marion, Notes of Travel Through Arizona in 1870, (Tucson: University of Arizona Press, 1965), pp. 48-49.

made to using boats for transportation. In a portion of the report titled "Means of Communication," Wheeler noted that "[t]he close of the [nineteenth] century bids fair to be the era, above all others, of increased rail communication." In this same section, he also observed the need for a wagon road route from Salt Lake City to Prescott, Arizona, but he did not discuss the possibility of using the available waterways such as the Salt River for transportation. Because Wheeler did note the use of navigation on the Colorado River, it is clear that he was aware of the utility of rivers as a means of transport. Yet aside from the Colorado River, Wheeler was pessimistic about the use of rivers in the West:

> One of the urgent wants felt in the promotion of our mining industry is that of increased and cheapened inland transportation. River transportation upon our western coast is, to a great extent, a failure, as beyond the Columbia and Colorado Rivers, that furnish somewhat irregular avenues of connection with the interior, no streams of considerable magnitude exist; river transportation, even in this very American age, loses its great power when pitted against railroads.

Wheeler's statement was made having observed the Gila, Verde, and Salt rivers years before the construction of most diversion and storage dams obstructed these streams. For these reasons, it is clear that Wheeler and his party did not consider the Salt River to be navigable.[144]

Dorothy Robinson, an early Phoenix settler, also remembered the Salt River in the late nineteenth or early twentieth century:

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[144] George M. Wheeler, et al., Report on Exploration of the Public Domain in Nevada and Arizona, House Ex. Doc. 65, 42nd Cong., 2nd Sess., (Washington D.C.: U.S. Government Printing Office, 1872) [LRA Box/File: 8/18]. Quote at p. 53.

> Before the Roosevelt dam was built, land was worth about twenty-five dollars an acre. Water was rarely plentiful. It was either too low to flow into the heads of canals or else was a raging torrent which swept away everything before it, including the dams and headgates.[145]

Clearly, Robinson's recollections echoed those of other early observers that the Salt River was unpredictable and unreliable for transportation.

PERCEPTIONS OF THE SALT RIVER BY ENGINEERS AND OTHER PARTIES: In addition to the early accounts and remembrances of the Salt River, engineers in the early twentieth century were very active in assessing the river's uses. Due to the decision by the U.S. Reclamation Service to make the Salt River the site of its first irrigation project, a multitude of reports on what became the Salt River Project as well as its predecessor private canals (see map on page 155) were produced by prominent non-Reclamation Service engineers. Many also corresponded with each other about the factors involved in building this famous project. The engineers' reports and correspondence represented here fully support the conclusions reached in other documentation.

One such report, written by consulting hydraulic engineer James D. Schuyler in 1902, drew preliminary conclusions about the Consolidated, Mesa, and Tempe canals and the Salt River. Describing the river where the canals headed as "sandy," Schuyler noted that "loss by percolation was very great." He further observed that the Consolidated Canal had been designed in part to

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[145] Dorothy Robinson, "The Heritage of the Salt River Valley," [ca. 1912] folder 69, box 11, Dorothy Robinson Papers, Mss. 69, Arizona State University, Tempe, Arizona [LRA Box/File: 6/16].

carry water to the Mesa and Tempe canals and it had cut down substantially on the loss of water in the river channel. Though exact measurements of the loss were not available, Schuyler's report emphasized that without the Consolidated Canal, much of the flow would sink underground in this reach of the stream.[146]

Frank Trott's letter to Howard S. Reed on June 27, 1913, further documented the nature of the Salt River's bed. In describing the reasons for the construction of the Indian Lateral by the Arizona Canal Company, Trott, the local court water commissioner, wrote that "[t]he river bed between the Utah and the Tempa [sic] dams, a distance of about four miles, was wide, crooked and very sandy, and during the normal and low water period, that is during most of the year, a large percentage of this water was lost by evaporation and seepage." He also observed that "a bar was constantly being formed in front of the upper Indian dam."[147] Both this obstacle as well as the crooked, sandy nature of the Salt River's bed in this stretch of the river would have made navigation very difficult, if not impossible.

E.C. Murphy's letter to Marshall O. Leighton on March 10, 1912, supports this characterization of the Salt River. Including a copy of a report on the available water-power and reservoir sites

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[146] James D. Schuyler, "Preliminary Report on the Consolidated Canal of Arizona, The Power Available Under It, the Disposal of Silt in the Canal, and the Subterranean Water Supply of Salt River Valley," April 29, 1902, James Dix Schuyler Collection, No. 135, Water Resources Center Archives, Berkeley, California [LRA Box/File: 8/12]. Quote at p. 3.

[147] Frank Trott to Howard S. Reed, June 27, 1913, Land Records, Salt River Project Archives, Phoenix, [LRA Box/File: 7/4].

on the Salt River Indian Reservation, Murphy noted that the Salt River flowed mainly in response to precipitation, but "[t]he rainfall [on the Salt River Indian Reservation] is small and very erratic." Presumably, the river's flow also would have been unpredictable. Augmenting that conclusion was Murphy's discussion of "Utilization of Water" on the Salt River. "From 1870 to 1894," he wrote, "several canals were built. Each canal had its own diversion dam which was a more or less temporary affair of brush and rock that was swept away or damaged by each passing flood."[148] Clearly, floods were a regular occurrence on this highly erratic stream.

LEGISLATIVE ACTION AND LITIGATION: Officials in Arizona, representing the courts as well as the lawmakers, agreed with the engineers that the Salt River was useless for the purposes of navigation. For example, the Arizona Territorial Legislature, meeting in its first session, passed on December 28, 1865, a "Memorial Asking Congress for an Appropriation to Improve the Navigation of the Colorado River." Seeking $150,000 to remove obstacles such as sand bars, snags, boulders, and other obstructions in the Colorado's bed, the memorial declared that **"the Colorado River is the only navigable water in this Territory[.]"** (Emphasis added.) It also noted that if the improvements were carried out, the Colorado would be navigable as far as Callville,

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[148] E.C. to Murphy to M.O. Leighton, March 10, 1912, Land Records, Salt River Project Archives, Phoenix, Arizona [LRA Box/File: 7/4]. Quote at p. 10.

where a wagon road would connect the Colorado with Salt Lake City.[149]

Less than thirty years later, the courts in the territory also began to look at the valley's resources. On March 31, 1892, Joseph H. Kibbey, judge of Maricopa County's district court, handed down his opinion in M. Wormser, et al. v. The Salt River Valley Canal Company, et al. The decision adjudicated the rights of various water users on the Salt River. Before turning to a discussion of relevant law and findings of fact in the case, Judge Kibbey first discussed the history of water use in the Salt Valley that led to the litigation. Kibbey wrote that the soil in the Salt Valley was very fertile when supplied with water, but the climate's aridity made irrigation necessary. The watershed of the Salt River, he observed, was

> extensive, and the river is consequently subjected to very great variations in the volume of water which it carries. During the winter months of December, January, February and until the middle of May there is a large volume flowing in the river, more than adequate for the irrigation of all the lands in the valley.

Kibbey then discussed the history of the various canals established in the valley to take advantage of the water supply of the river. These included Jack Swilling's ditch (constructed beginning in 1867 -- and later taken over by the Salt River Valley Canal Company and the Maricopa Canal Company), the Tempe Irrigating Canal (begun in

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[149] "Memorial Asking Congress for an Appropriation to Improve the Navigation of the Colorado River," Acts, Resolutions, and Memorials of the Territorial Legislature of Arizona, 1865 (N.p., n.d), copy at Arizona Historical Foundation, Arizona State University, Tempe, Arizona [LRA Box/File: 8/23].

1870), the San Francisco Canal (started in 1874 and 1875 by M. Wormser), the Utah Canal (1877), the Grand Canal (1878), the Mesa Canal (1879), the Arizona Canal (which posted a notice of appropriation in 1883), the Highland Canal Company (notice of appropriation in 1887), and the Cross-Cut Canal and Power Company (which began construction of a canal linking the Grand, Maricopa, and Salt River Valley canals in 1889). All of these canals were named as parties to the suit, as was Charles T. Hayden, who began taking water through the Tempe Canal for his flour mill in 1874. Kibbey wrote that the earlier canals diverted water primarily for hay, grain, and garden vegetables, confining diversions to the time of year when water was most abundant (the winter months). He added, however, that as settlement increased, other crops had been planted (such as fruits, vines, and alfalfa) that required water year round. Ultimately, diminishing supplies during the summer months led to the filing of the lawsuit.

Kibbey wrote that on February 7, 1887, the Salt River Valley Canal Company, the Maricopa Canal Company, M. Wormser (as owner of the San Francisco Canal), the Mesa Canal Company, Charles T. Hayden, the Tempe Irrigating Company, the Utah Canal Company, and the Grand Canal Company filed suit against the Arizona Canal Company to have their respective rights adjudicated. Judge Kibbey added that the plaintiffs stated that the Salt River was

> a natural **unnavigable stream** rising in the mountains in the eastern part of the territory and running thence in a westerly direction to its junction with the Gila river in Maricopa county. [Emphasis added.]

Kibbey added that the plaintiffs had argued there were 150,000 acres of irrigable lands in the Salt Valley, but that the volume of water in the Salt River was so diminished during the summer season that the amount of water flowing in it did not exceed 18,000 miners' inches. Kibbey defined a miner's inch to be 1/40 of a cubic foot per second, so the flow was not above 450 cubic feet per second. He noted that the plaintiffs reviewed the history of their appropriations on the river (which totalled 62,500 miners' inches), and they stated that they had built several dams to divert the water into their ditches. Kibbey's review of the litigation then explained:

> The plaintiffs further allege that on or about the 1st day of January, 1887, being long subsequent to the appropriation and use by them and their grantors of the several quantities of water hereinabove mentioned, the Arizona Canal company, defendant in violation of the plaintiff's rights entered upon the river at a point above any the dams and ditches of plaintiffs and about twenty-eight miles east of the city of Phoenix, and by means of a dam constructed across the river, there, capable of holding all of the waters flowing in the river, and by means of a canal commencing at the dam and running thence northwesterly, of a size sufficient to carry all the waters flowing in the river during a dry season at a time when the water is needed by the plaintiffs, diverted and turned out of the river a large quantity of water of the river, and by such diversion prevented the water from reaching the ditches of the plaintiffs, and had diminished the quantity of water to such an extent that the plaintiffs and each of them was prevented from procuring a sufficient supply of water for their crops aforesaid, whereby such crops are now suffering and are in immediate danger of actual destruction.

Based on this complaint, the plaintiffs asked Kibbey to force the defendants to remove their dam and not interfere with the flow of the Salt River. The complaint was later amended to change some of

the plaintiffs to defendants and to modify some of the complaints. The case went to trial in March 1890 and final arguments took place in February 1891. The trial resulted in 6,000 pages of evidence. Following a discussion of the relevant law, Kibbey presented his findings of fact regarding the relative rights of various appropriators.

The significance of this lawsuit is fourfold: First, Judge Kibbey acknowledged the varying flows of the Salt River; second, the plaintiffs complained that the Arizona Canal had begun diverting all of the water in the river during dry seasons, leaving none for downstream canals; third, the construction of the Arizona Dam across the river had not resulted in any objections from navigation interests, nor were any such entities named as plaintiffs in the suit. Fourth, the plaintiffs had declared the Salt River to be non-navigable. All of these points suggest that the larger Salt River Valley community did not consider the Salt to be navigable.[150]

Approximately twenty years later, another critical court decision was handed down in the Territory of Arizona which supported the same conclusion regarding the nature of the Salt River as the Wormser decision. On March 1, 1910, Judge Edward Kent of the third judicial district court of the Territory of Arizona issued the Kent Decree in Patrick T. Hurley v. Charles F. Abbott, et al. The provisions of the decree were to take effect on April

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[150] M. Wormser, et al. v. The Salt Valley Canal Co., et al., March 31, 1892, No. 708, Maricopa County District Court, Phoenix, Arizona [LRA Box/File 4/7]. Quotes at pp. 1, 5, 9.

1, 1910. The ruling described the physical attributes of the Salt River Valley, then reviewed the history of irrigation stating that at the time of the decision there were about 151,000 acres of land under attempted cultivation. Much of this area, Kent noted, was served by irrigation canals diverting from what was known as the Joint Head. Judge Kent then provided additional details about irrigation from the Salt River:

> Although all the water flowing in the Salt river is, in the lower stages of the water in the river, diverted by canals which have their heads at such points in the river, nevertheless additional land lying to the westward, not covered by the ditches aforesaid, is irrigated by means of ditches which have their heads in the river below the Joint Head. This is made possible by the peculiar conditions which obtain in the river whereby, though dry above, water rises in the channel of the river below, forming a new source of supply independent of that diverted above.

Reviewing the history of the various ditches in the valley and the litigation in Wormser, et al. v. Salt River Valley Canal Company, Judge Kent contended that in that case, Judge Kibbey had not determined the rights of individual water users but only the amounts of water that each canal could divert in order to irrigate the number of quarter sections it served. Kent further observed that there never had been any attempt to enforce the decree in the Wormser suit because the canal companies subsequently had reached their own agreements on how to divide the river's waters. Although these compacts used the entire normal flow of the Salt River, Kent wrote that the accords were occasionally contested by individual water users who felt they were not getting the water they deserved under a particular canal.

Kent added that in 1903, the U.S. Reclamation Service had begun construction of Roosevelt Dam on the Salt River just below its confluence with Tonto Creek and the resulting reservoir was beginning to store water as of the date of Kent's decision and decree. Kent wrote:

> The object of the dam and the purpose of the Government in its erection is to store in the reservoir the surplus water in the Salt river over and above the amount of the normal flow of the river appropriated and used. The Government also finished the construction in the year 1908 of a permanent diversion dam across the Salt river known as the Granite Reef dam at a point about twenty-five miles east of Phoenix, three miles below the conflux of the Verde river, from which dam water is now being diverted into the Arizona canal for the use of the land lying on the north side of the river, and which now diverts a large portion and which is capable of diverting all of the water necessary for the land on the south side of the river.

Adding that the Salt River Valley Water Users' Association had been formed to represent irrigators in what became known as the Salt River Project, Kent explained that Patrick T. Hurley had instituted a lawsuit in 1905 to settle the respective rights of water users throughout the valley. The United States intervened due to its interest in the Salt River Project and its representation of Indians in the valley. In his decree (the outcome of much testimony on the respective duties of water and reclaimed lands in the valley), Kent then reviewed the principles of prior appropriation in Arizona, **observing that those principles applied to non-navigable streams and that they therefore were relevant to the Salt River litigation.** He also said it was necessary to ascertain how much water was available in order to apportion it among the various canals for the different water users. "The

amount of water flowing in the river," Kent observed, "varies greatly in each month in the year, and in a given month in each year. No accurate or probable estimate of the amount of water that will be available either by the month of by the year can be predicted." To support this statement, he included in his opinion a table of precipitation and canal diversions for the past fourteen years. Kent then reviewed how much water was to be allowed to each canal to compensate for evaporation and transmission losses, and he gave his view that 48 miners' inches was sufficient flow, in addition to evaporation and transmission losses, for good crop production.

The significance of the decree rendered in Hurley v. Abbott (known as the Kent Decree) is similar to Judge Kibbey's decision in the Wormser case. Again, a prominent judge -- this time Edward Kent -- had declared that all of the water in the Salt River had been diverted, and he and noted the river's strange character of rising at some places on the valley floor and disappearing at others. In addition, Kent had termed the Salt River to be non-navigable. Furthermore, Kent wrote about the wide fluctuations in flow, claiming the stream was "unpredictable." Additionally, Kent discussed the then-recent construction of Granite Reef Dam across the river, but he never alleged this type of structure would be an impediment to navigation. Similarly, there are no

indications that navigational interests played any role in this lawsuit.[151]

OTHER MISCELLANEOUS DOCUMENTS: The engineers, legislators, and judges were clear and unequivocal about their perceptions of the Salt River. According to their descriptions, the river rose far above flood stage on a regular basis, and during times of normal flow, sank beneath the surface of its wide, sandy bed in many places. Neither condition was conducive to consistent commercial navigation. Aside from engineers' reports and correspondence, evidence of the floods was found in many other historical sources. For instance, accounts of flooding on the Salt River were contained in the meeting minutes of the Salt River Valley Water Users' Association. Transcribed by Frank H. Parker, the Association's secretary, Parker noted the flood in November 1905:

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[151] Patrick T. Hurley v. Charles F. Abbott, et al., March 1, 1903, No. 4564, Third Judicial District Court of the Territory of Arizona, in and for the County of Maricopa [LRA Box/File: 4/6]. Quotes at 4, 7, 10. In a much more recent lawsuit, filed on July 17, 1972, in U.S. District Court, another judge confirmed the Wormser and Hurley opinions on non-navigability of the Salt. In this case, the Salt River Pima-Maricopa Indian Community had sued the Arizona Sand and Rock Company and several others seeking recognition that the bed of the Salt River (in which the defendants were mining sand and gravel) was actually owned by the Indians. The plaintiffs sought damages and removal of the defendants, claiming that under the executive order which had created the Indians' reservation (June 14, 1879), the bed of the river to the middle of the channel was considered part of their land. As part of the order consolidating the suits, Judge W.D. Murray declared: **"The Salt River is not now and never has been a navigable river."** See p. 1068 in "In the Matter of the Navigability of the Salt River [From Granite Reef Dam to the Gila River Confluence], Admin. Docket No. 94-1, Before the Arizona Navigable Streambed Adjudication Commission."

> The floods due to storms on November 26th destroyed the Arizona dam, rendered the headworks useless, and seriously damaged the canal for a distance of two miles from the head, and also seriously damaged the joint headworks of the Maricopa and Salt River Valley Canals.[152]

During the same month, the Committee of Sixteen, formed by the Salt River Valley Water Users' Association to make adjudication recommendations in the Hurley v. Abbott case, produced a report on the river's conditions. Stressing its wide variations in flow, the report stated:

> We further find that during the past ten years the fluctuating flow of the Salt and Verde rivers which has been actually diverted and beneficially used upon the said lands lying under all the various canals, has amounted to an average flow of 24,884 miners' inches and has varied from a minimum flow of 3,000 miners' inches to a maximum flow of 85,000 miners' inches.[153]

The sporadic nature of the river was further documented by a booster-type brochure trumpeting the attributes of Phoenix. James H. McClintock, Arizona historian, journalist, and author of the brochure, noted that

> [t]he Salt River Valley has within it about 200,000 acres of land in private ownership. Only three-fifths of this area now is cultivated, for the Salt is an erratic sort of stream. For weeks its flow may forbid passage at any

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[152] "Minutes of the Salt River Valley Water Users' Association Meeting," March 5, 1906, Land Records, Salt River Pima-Maricopa Indian Reservation, Salt River Project Archives, Phoenix, Arizona [LRA Box/File: 7/4].

[153] "The Committee of Sixteen to the Salt River Valley Water Users' Association," Nov. 1905, Water Resources Center Archives, University of California, Berkeley, California [LRA Box/File: 9/3], Quote at p. 5. The "Kent Decree," issued in Hurley v. Abbott, defined a miner's inch as one-fortieth part of one cubic foot of water flowing per second of time.

> ford, and yet within a month the traveler may cross dryshod.[154]

According to Herbert R. Patrick (who had surveyed the area around the Salt River as part of the northern boundary of the Gila River Indian Reservation in 1899 -- see page 50), these sandy, spasmodic conditions had been present long before the twentieth century. In a short bulletin called The Ancient Canal Systems and Pueblos in the Salt River Valley, created for the Phoenix Free Museum in 1903, Patrick wrote regarding the ancient Hohokam communities that once dominated the Salt River Valley:

> [A]s their colonies increased in population and resources, and as their canals were damaged by floods and as they required more extensive tracts of land they went a little higher up stream, where high and more permanent banks gave better foundation and protection, and there built larger and better canals, and probably found a better supply of water, where it was not as apt to sink in the bed of the river.[155]

The construction of canals and dams on the river is one of the most important pieces of evidence indicating the non-navigability of the Salt River. With irrigation being the primary use of the river, many diversion dams were built throughout the decades following the Swilling Ditch's construction in 1868 (see map on page 155), and because of the frequent floods, many had to be re-constructed numerous times. For example, the Hudson Reservoir and Canal Company (whose water rights were later acquired by the U.S.

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[154] Phoenix, Arizona in the Great Salt River Valley (Phoenix: Phoenix and Maricopa County Board of Trade, 1908), p. 9.

[155] Herbert R. Patrick, The Ancient Canal Systems and Pueblos of the Salt River Valley, Arizona, Phoenix Free Museum Bulletin No. 1 (Phoenix: Phoenix Free Museum, 1903), p. 6. [LRA Box/File: 8/13].

Reclamation Service) filed notice on April 15, 1893, that it intended to appropriate all the surplus and flood water of the Salt River above that stream's confluence with the Verde and that it intended to build a dam on the Salt ten miles above the confluence with the Verde to store such waters. In addition, the notice provided that another dam was to be constructed near the confluence of the Salt and Tonto Creek at approximately the site where Roosevelt Dam was later built. Finally, the notice indicated that the company planned to divert the stored waters for irrigation uses in the Salt River Valley. There was no evidence at the time or subsequently that any navigation interests objected to the dams or diversions.[156]

Speeches given by two prominent Arizona personalities shortly after the turn of the century also support the river's historical character. Joseph H. Kibbey, judge in the Wormser case, spoke in 1907 to the Fifteenth National Irrigation Congress in Sacramento, California. In his speech, Kibbey focussed mainly on the implementation of the National Reclamation Act and the disputes that were arising as a result of its passage. Predictably, Kibbey used the situation in the Salt River Valley as an example of the vexing situations that were evolving under the law. In discussing the fight over the waters of the Salt River, Kibbey stated that

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[156] Notice of Hudson Reservoir and Canal Company to appropriate water, April 15, 1893, in file "Salt River Project. Water Appropriations," General Administrative and Project Records, 1902-1919, Record Group 115, U.S. National Archives branch -- Rocky Mountain Region, Denver, Colorado [LRA Box/File: 11/9].

> [i]t is the blindest sort of folly to treat the fluctuations of the river, which could be foreseen by the most casual obserevr [sic], and which had forced themselves upon the attention of every water user in the valley, as an unusual condition. . . .

The erratic nature of the river was known to all residents of the valley according to Kibbey.[157]

Early Phoenix resident Carl Hayden agreed. In his speech in front of the U.S. House of Representatives on February 3, 1916, the subject was flood control on non-navigable streams. House Resolution 122 had been introduced by the Speaker of the House, and Hayden interpreted the Speaker's intention to be the creation of "a committee having jurisdiction over all bills relating to flood control whether the floods occur on navigable or non-navigable streams." Hayden explained his support of this resolution: "I come from a State where we have dry rivers and no harbors, and I want to see a committee established that will give consideration to the flood problems on nonnavigable streams." In commenting on the constitutionality of federal funding for flood control on non-navigable streams, Hayden argued that such an expenditure was not only in the local interest, but also in the national interest. He claimed that railroads were often affected by floods, which hurt interstate commerce, and that the U.S. Postal Service was also consistently interrupted by flooding. He also argued that the care of national defense would be assisted by funding for flood control,

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[157] Joseph H. Kibbey, "Address of Hon. Joseph H. Kibbey Delivered Before 15th National Irrigation Congress at Sacramento, CA.," Sept. 4, 1907, Water Resources Center Archives, Berkeley, California [LRA Box/File: 8/13].

asserting that "troops can not be readily moved or supplied when the rivers are in flood." Hayden's remarks in this speech make it clear that in his view all Arizona streams were non-navigable, including the Salt. What Hayden sought, therefore, was money to curb flooding on the state's unpredictable streams, including the non-navigable Salt.[158]

MORE RECENT HISTORICAL STUDIES: More recent studies confirm historical documents about the nature of the Salt River. An article, submitted to The Reclamation Era and presented to the National Reclamation Association's meeting in Phoenix in 1947, contained information useful for determining the Salt River's navigability as of 1912. Odd S. Halseth, the author, stated that

> [e]ighty years ago the Salt River was a deep and narrow stream with a permanent flow. Within a few decades it became erratic [sic] as only a desert stream can when the natural covering of the watershed is impaired. With the expansion of farming, cattle, lumber and mining industries, run-offs from the watershed increased to flood dimensions, often cutting new channels, and after they washed out the farmers' diversion dams and spent their dynamic force on other destruction, the flow usually became insufficient for irrigation of current crops. . . .[159]

It is clear from Halseth's paper -- as well as from the overwhelming historical record -- that by the time of Arizona

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[158] Carl Hayden, "Speech of Hon. Carl Hayden, of Arizona, in the House of Representatives, Thursday, February 3, 1916," folder 11, box 653, Carl Hayden Papers, Mss. 001, Arizona State University, Tempe, Arizona [LRA Box/File: 6/15].

[159] Odd S. Halseth, "1500 Years of Irrigation History," Water Resources Center Archives, Berkeley, California [LRA Box/File: 8/13].

statehood, the Salt River was already unpredictable and not navigable.

A Master's thesis from the University of Arizona supports these conclusions about the erratic nature of the Salt River. John Porcello's 1988 thesis studied the area from the confluence of the Salt and the Gila rivers to just above the Salt's confluence with the Verde River to determine groundwater presence. Although focussing on underground supplies, the study was augmented by important historical data about the Salt River's surface flow.

Porcello described the Gila and Salt Rivers as perennial streams "only in reaches upstream of the study area, [and] have been completely diverted by extensive canal systems serving agricultural and municipal water demands since the middle of the 19th century." Adding that "[b]y the 1890s, water use by farms and small towns had resulted in the diversion of the entire flows of both the Salt and Gila Rivers," he noted that "[u]nregulated flows impacting the East Valley were highly seasonal prior to 1910, more than half the annual flow occurring between October and April and the remainder resulting from spring discharges and flash floods during the summer months."[160]

Another relatively recent report substantiating these historical conclusions was an overview written for the Salt River Project by Jay Ziemann about the history of the San Francisco

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[160] John Joseph Porcello, "Pre-Development Hydrologic Conditions of the Salt River Indian Reservation, East Salt River Valley, Central Arizona, With an Emphasis on the Ground-Water Flow Regime," (M.S. thesis, University of Arizona, 1988), pp. 14, 21, 30. [LRA Box/File: 9/4].

Canal. As part of a series titled Historic American Engineering Record, Ziemann noted in this report that

> despite what appeared at the time to be modernizing efforts, the San Francisco Canal was still an unlined ditch, plagued by seepage and evaporation problems. . . . High water in the river would frequently wash out the canal headings. These problems seemed to be recurring nightmares for the developers of the Salt River Valley in the 1870s and 1880s.

Though most nineteenth-century canals were constructed with rock and brush, Ziemann observed that "there were economic consequences for the hastily built. Everyone in the valley realized that they could not continue to reconstruct every time the river was high."[161] The destruction that high water caused as well as the dry fields brought by low water shows how difficult regular navigation would have been on the Salt River. Water levels could simply not be depended upon.

In another recent historical study, Barbara Behan's report examined the Salt River in three segments to assess the stream's navigability. Written in 1988 and utilizing a wide array of primary and secondary sources, Behan's report ultimately concluded that while there may have been instances of boats being floated on the Salt prior to 1912 (including ferries and at least one instance of floating flour to market), the river was never considered

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[161] Jay Ziemann, "HAER No. AZ-8, San Francisco Canal," [n.d.] pp. 25, 30, Salt River Project Archives, Phoenix, Arizona [LRA Box/File: 7/3].

commercially navigable. This was largely due to its erratic nature and variations of the channel.[162]

Karen Smith, another recent historian of the Salt River, reached the same conclusion as Behan. In her doctoral dissertation which was later published as The Magnificent Experiment, Building the Salt River Reclamation Project, 1890-1917 (1986), Smith described the Salt River Valley:

> On the face of it, the growth of metropolitan Phoenix from a dusty village located near the Salt River to the ninth-largest city in the United States has been something of an anomaly. There was no major railroad connection to Phoenix until the 1920s, **no harbor or navigable river** to spawn commerce, and no major trail or crossroads to lure tired travelers to stop. [Emphasis added.][163]

SUMMARY AND CONCLUSIONS REGARDING MISCELLANEOUS DOCUMENTS: Despite the variety of the sources discussed above, the same conclusion was reached in every case. Each organization, person, and agency's evidence demonstrated characteristics which made the Salt River unreliable for the purposes of consistent commercial navigation. The prevalence of floods, dams, and a sandy bed combined to cause major impediments to any sort of commerce.

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[162] Barbara Behan, "An Historical Analysis of the Salt River, 1830-1912," Salt River Project Archives, Phoenix, Arizona [LRA Box/File: 6/5].

[163] Karen L. Smith, The Magnificent Experiment, Building the Salt River Reclamation Project, 1890-1917 (Tucson: University of Arizona Press, 1986), p. ix.

CHAPTER 6: PHOTOS

In addition to the voluminous textual evidence retrieved in research, numerous photographs were also obtained. These photographs provide visual documentation which lead to the same conclusions reached in the unpublished and published document collections. Included here is a selection of different photos showing various levels of the Salt River's flow. Some show the river to be completely dry, while others demonstrate the devastation of the regularly occurring floods. The photographs, spanning over thirty years from 1888 to 1920, provide visual evidence of the erratic and unreliable nature of the Salt River. For example, the photo displaying the Tempe bridge from the river bed around 1910 (see photo on page 208) shows water flowing in the river. But another photo taken from an almost identical location and also dated around 1910, displays a river bed with no water in it at all (see photo on page 214). Contrasting images such as these lead to the same conclusion as the textual information. Such drastic changes in the river's condition made the stream completely unreliable for the purposes of navigation. Although this report also includes a few photos which show boats on the river, it is clear from the majority of photos obtained that boating on the river was the exception rather than the rule and that the river was not reliable for transportation.

"Hayden's Ferry across Salt River, Tempe, AZ, old railroad bridgein background," 1895, ASU, Hayden Library, Sp. Coll.

"Remains of Arizona Dam, 1905 flood, 1905, Salt River Project Archives

195

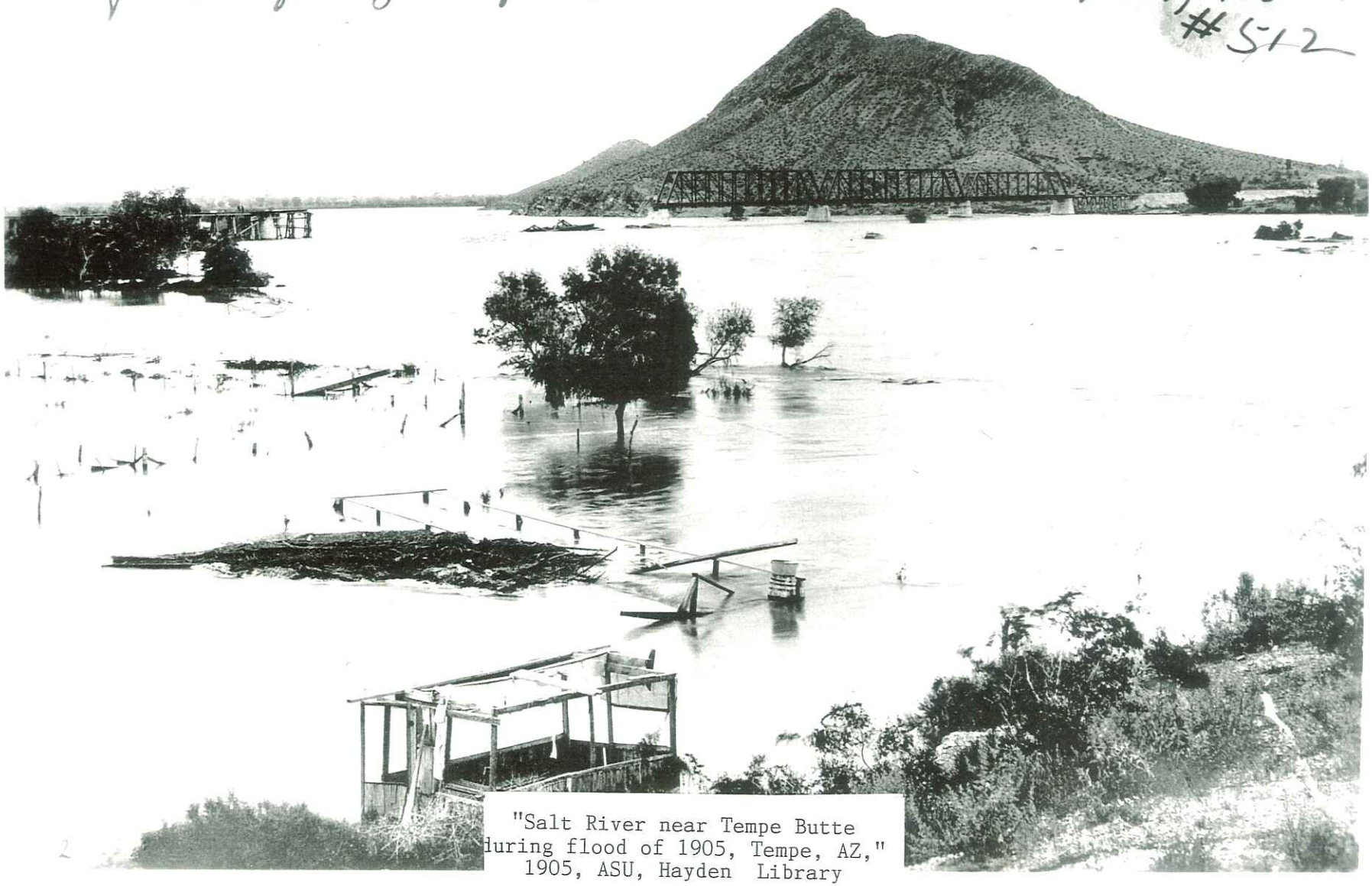
"Old waste ga[illegible]s of Arizona Canal after flood, 1/2 mile from headgates," April 16, 1905, Salt River Project Archives

196

"Old Southern Pacific Railroad bridge over Salt River; floods left bridge in tact," April 14, 1905, Salt River Project Archives

Looking toward Tempe Butte from north end of S.P. bridge showing S.F.R.R bridge wrecked in flood of night of Apr 12, 1905

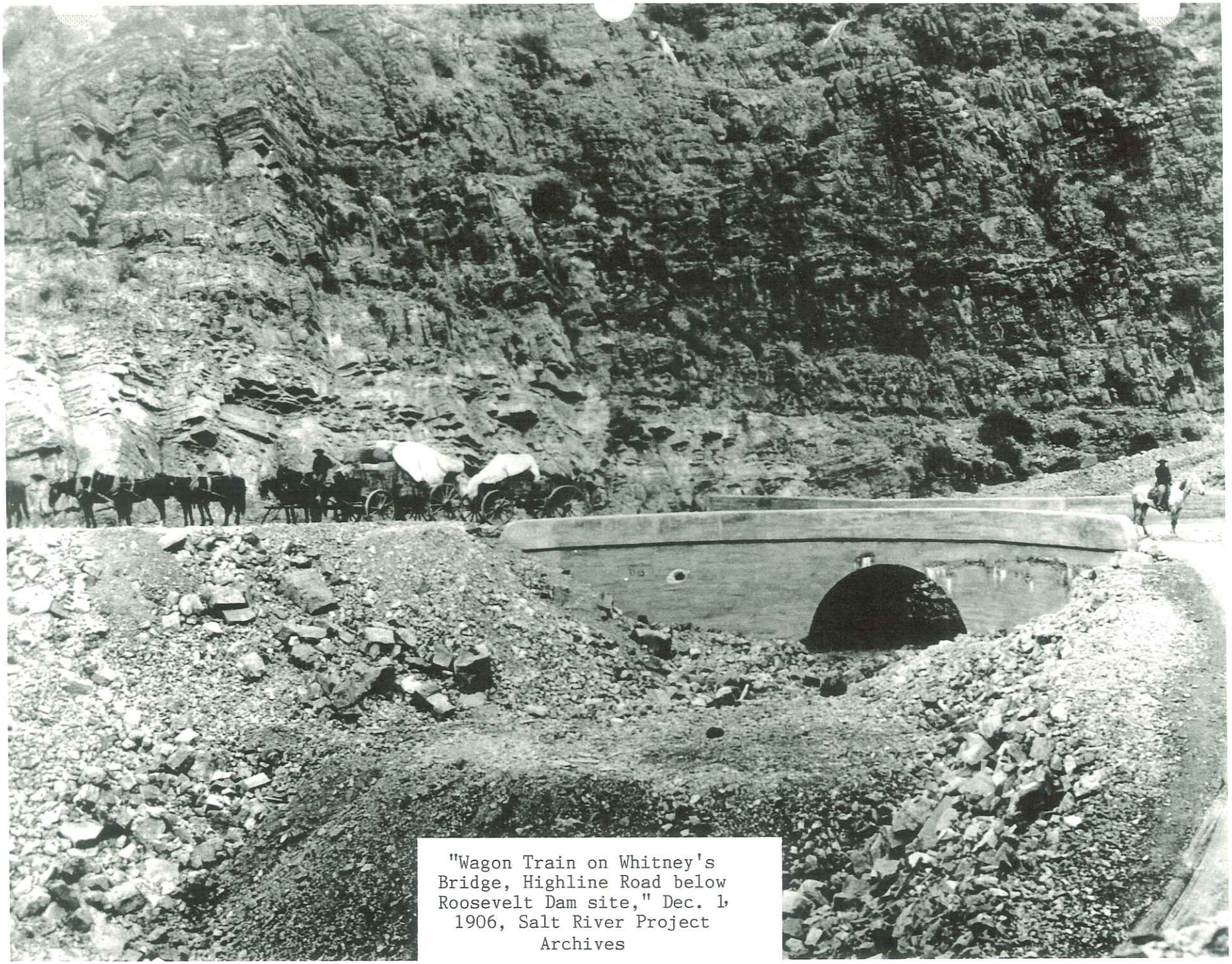
Apr 14, 1905
#512



"Salt River near Tempe Butte during flood of 1905, Tempe, AZ," 1905, ASU, Hayden Library

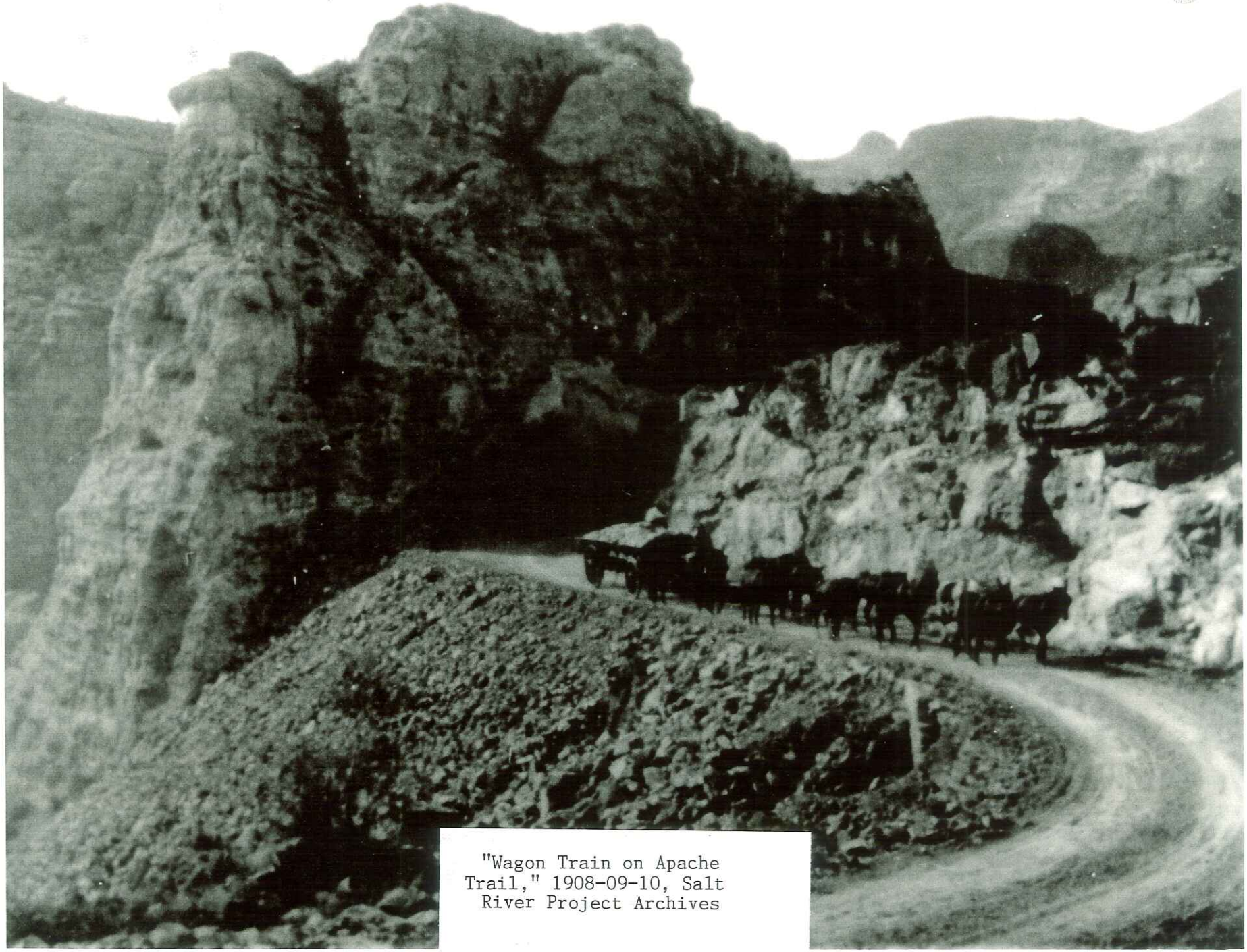
Sp. Coll.

1981



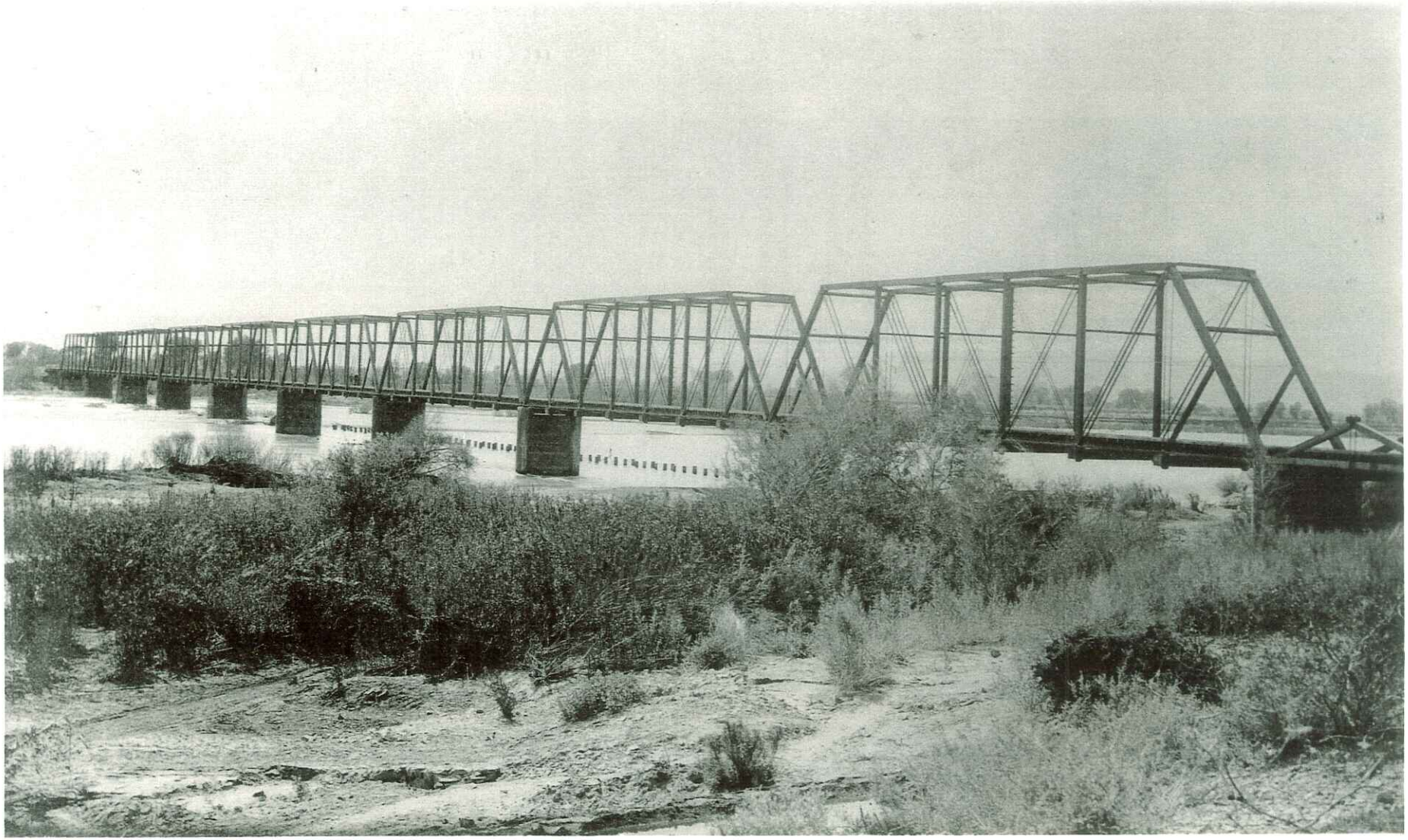
"Wagon Train on Whitney's Bridge, Highline Road below Roosevelt Dam site," Dec. 1, 1906, Salt River Project Archives

"Freighting heavy machinery to Roosevelt from Mesa," July, 1907, Salt River Project Archives

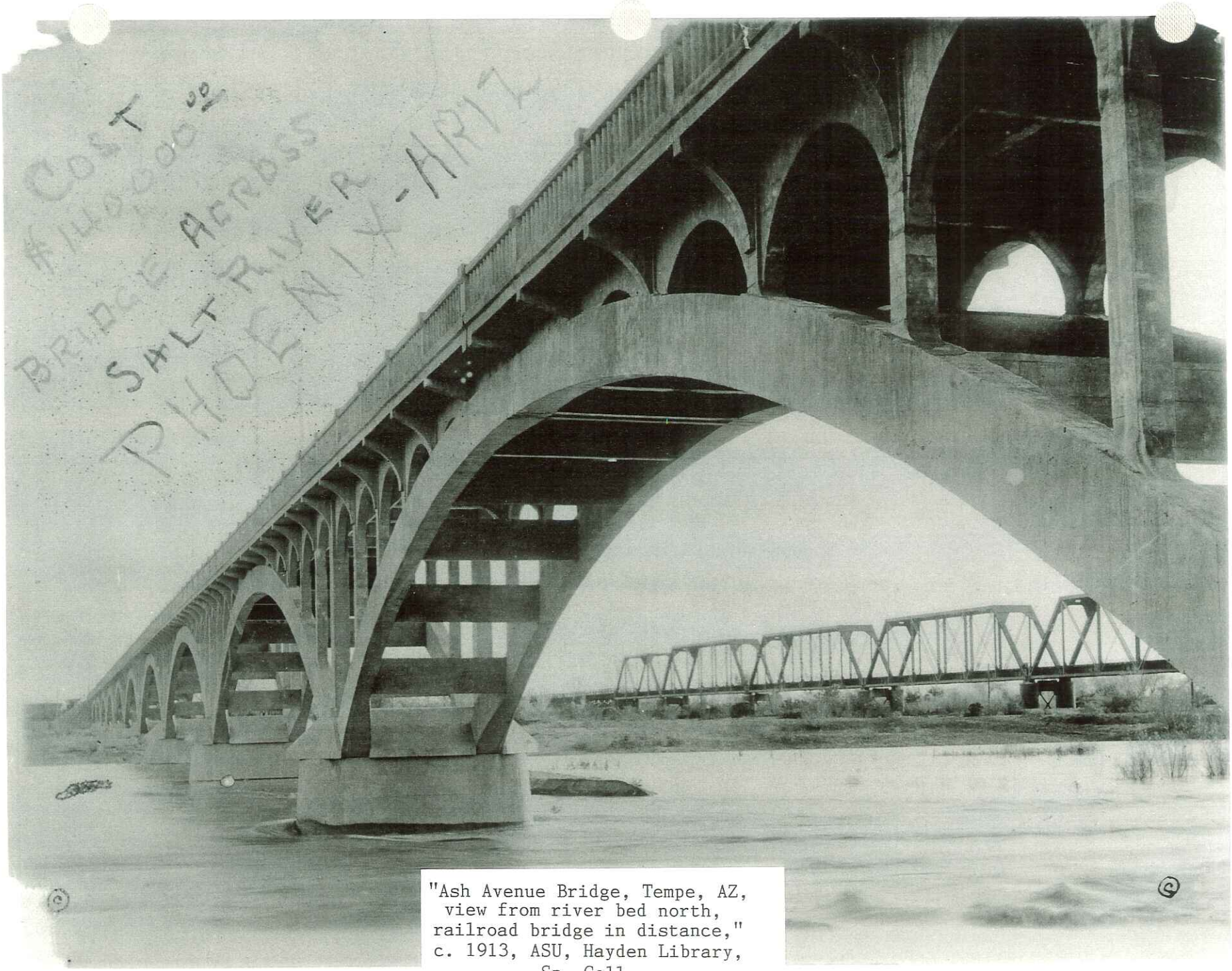


"Wagon Train on Apache Trail," 1908-09-10, Salt River Project Archives

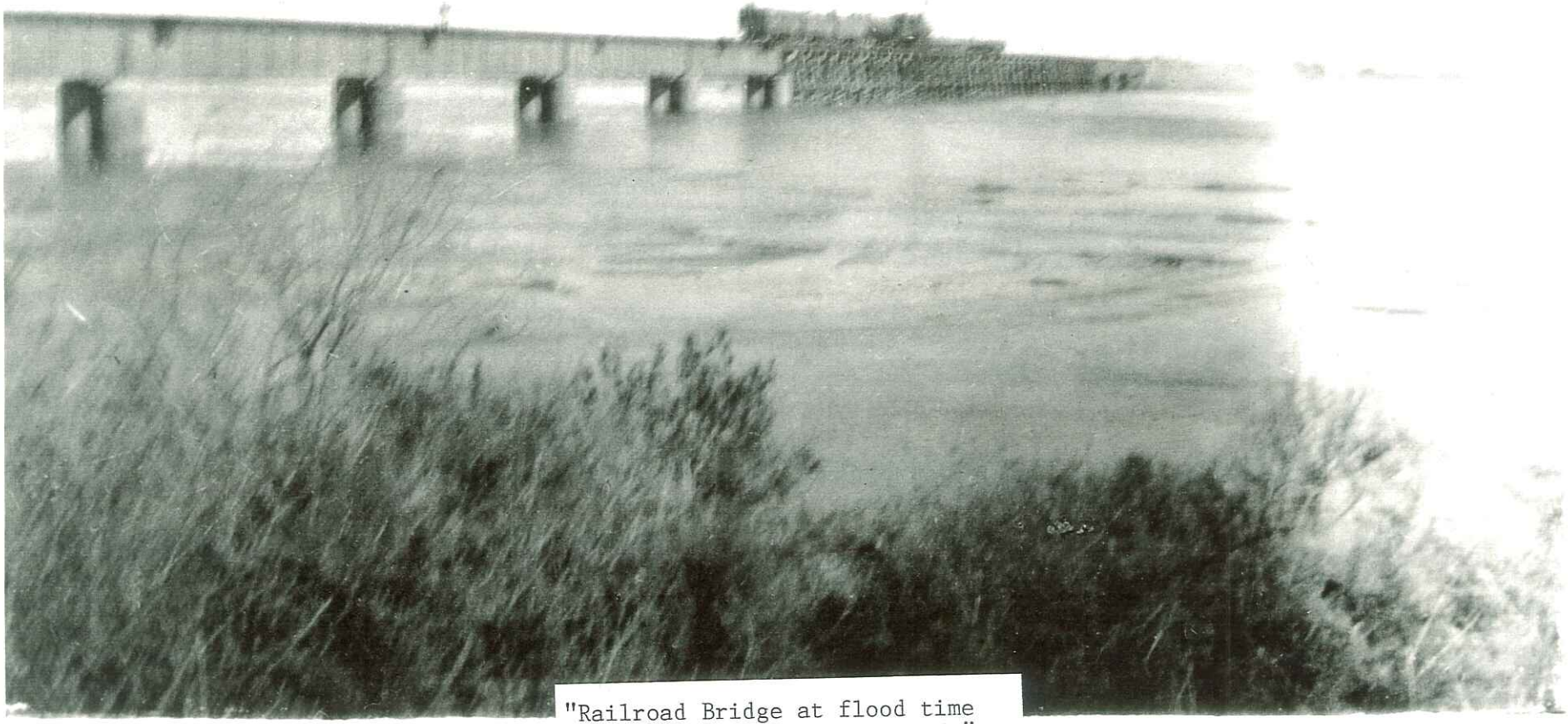
"Stuck in sand below Granite Reef Dam, McDermott's Butte in distance," 1914, Salt River Project Archives



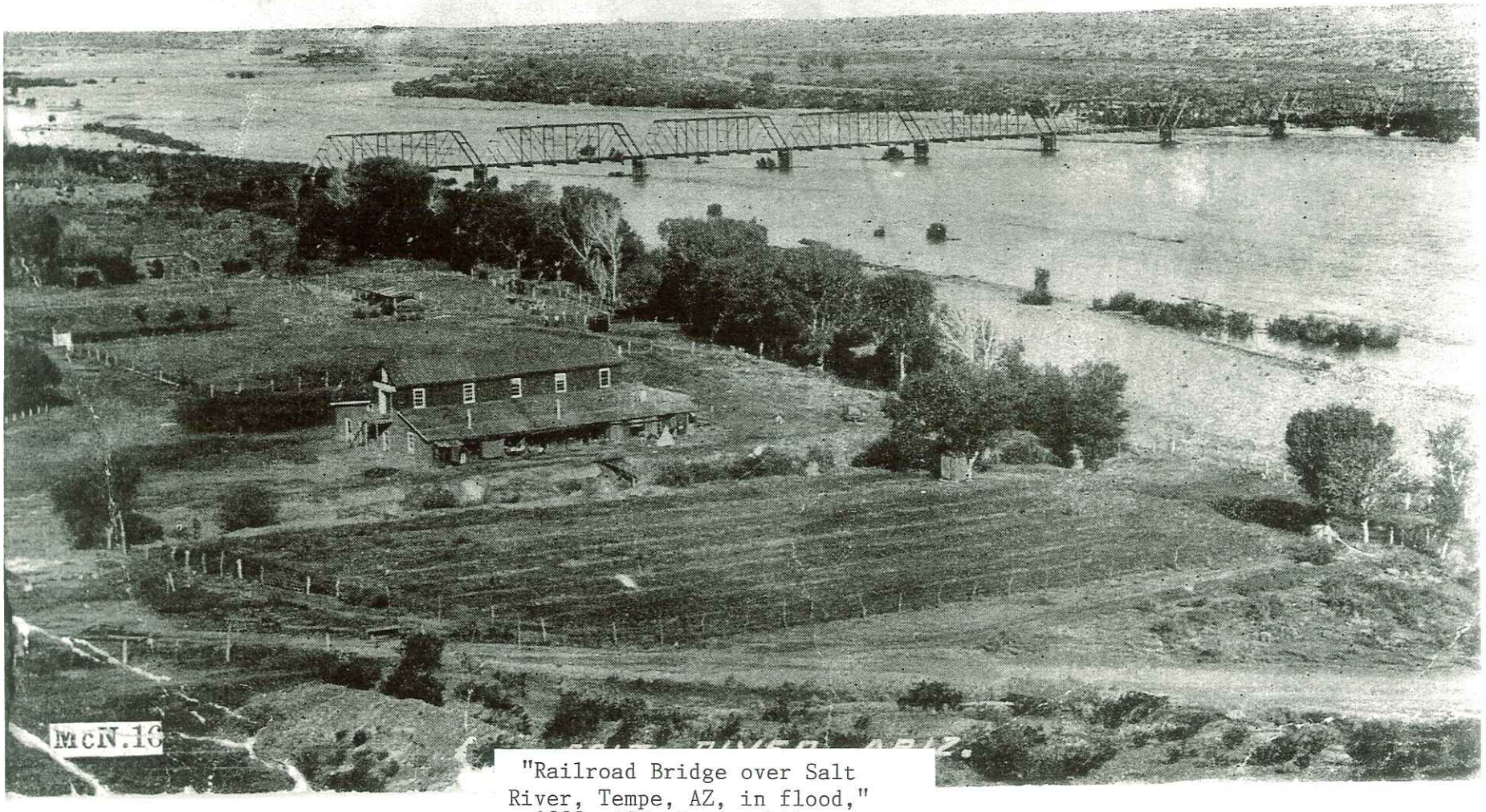
"Railroad Bridge at Tempe, AZ
'Normal Flow in Salt,'" c. 1900
ASU, Hayden Library, Sp. Coll.



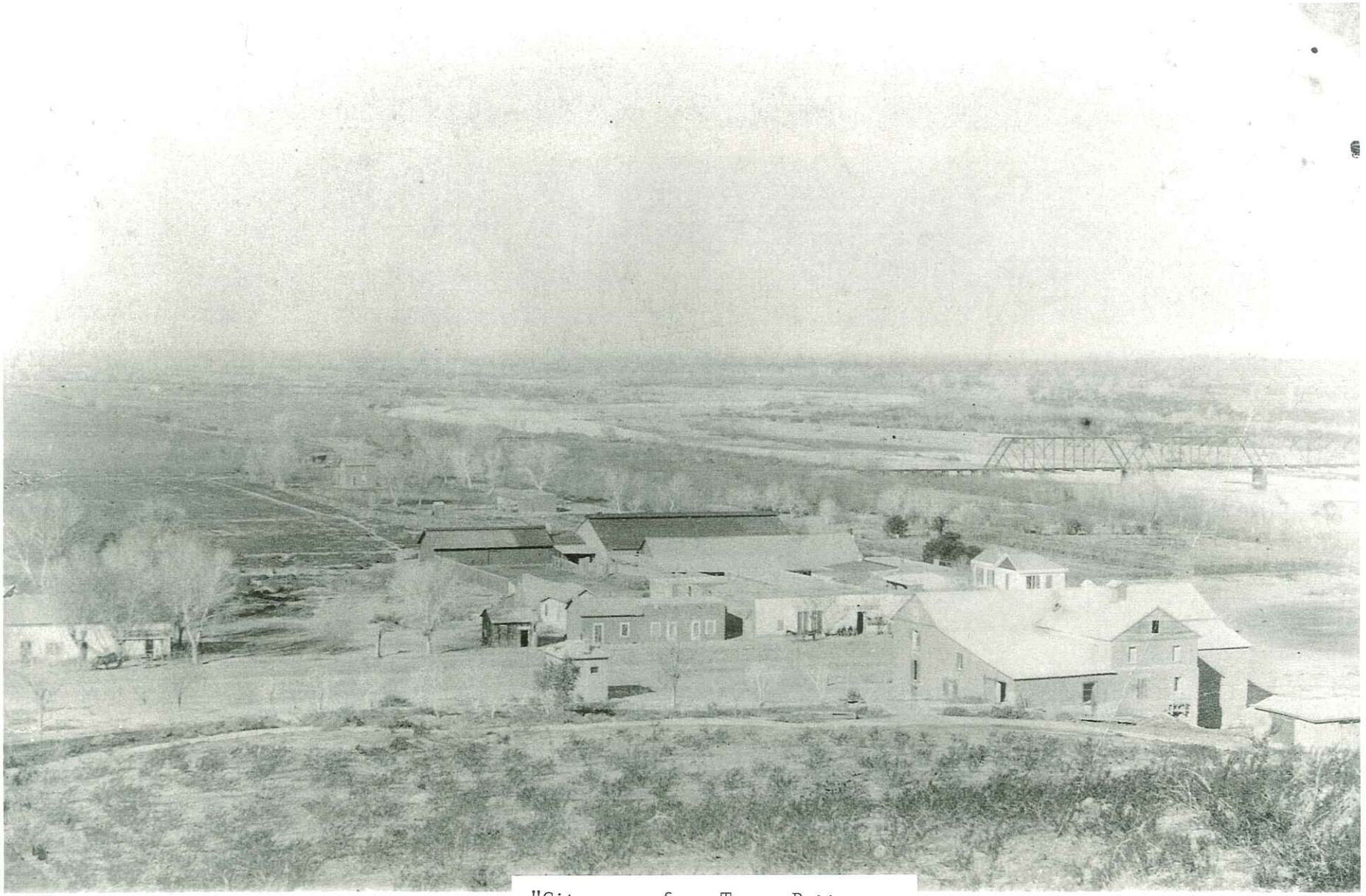
"Ash Avenue Bridge, Tempe, AZ, view from river bed north, railroad bridge in distance," c. 1913, ASU, Hayden Library, Sp. Coll.



"Railroad Bridge at flood time
on the Salt River, Tempe, AZ,"
1911, ASU, Hayden Library,
Sp. Coll.



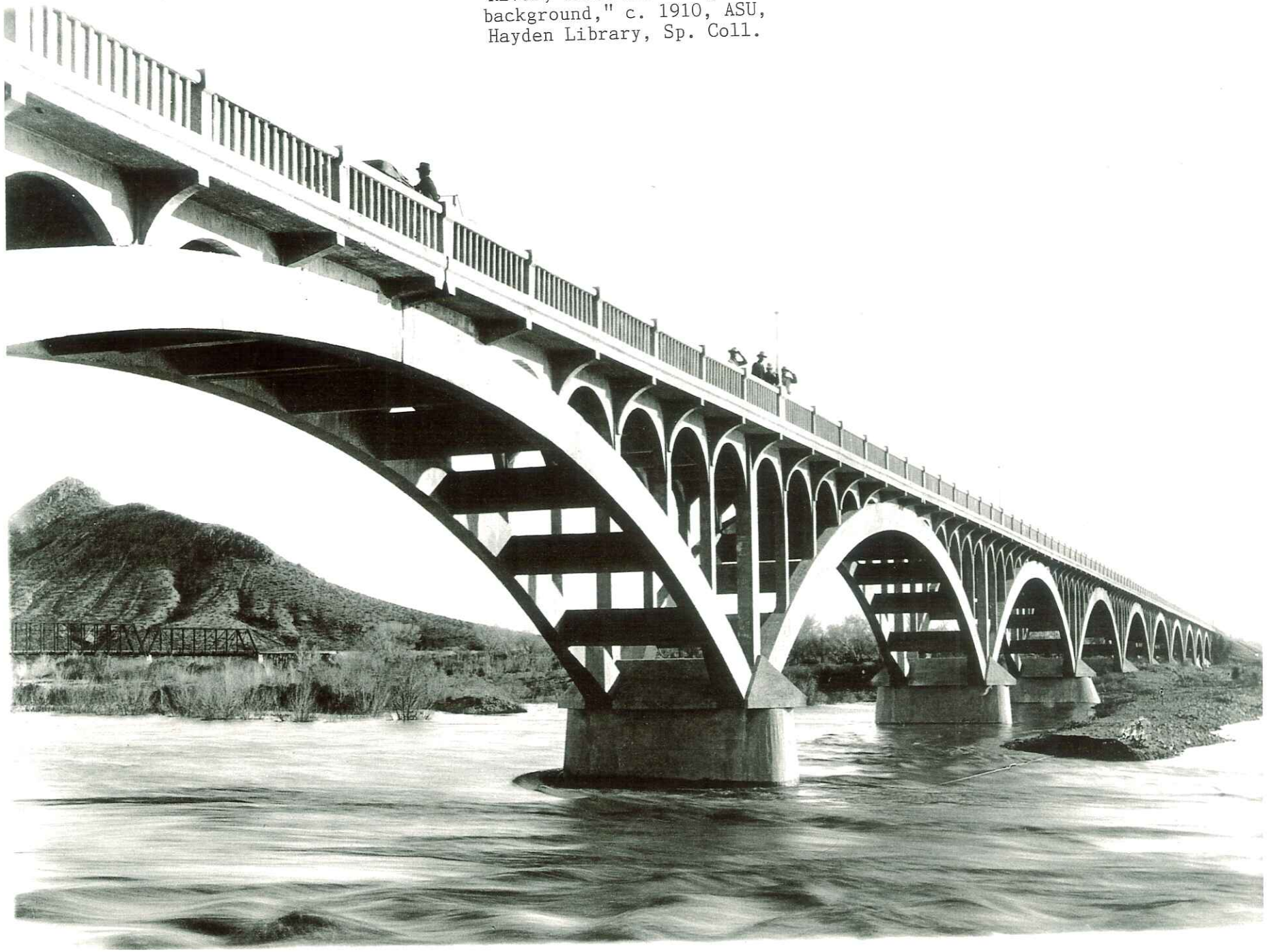
"Railroad Bridge over Salt River, Tempe, AZ, in flood," 1888, ASU, Hayden Library Sp. Coll.



"Cityscape from Tempe Butte,
Tempe, AZ, river not in flood,"
1905, ASU, Hayden Library

Sp. Coll.

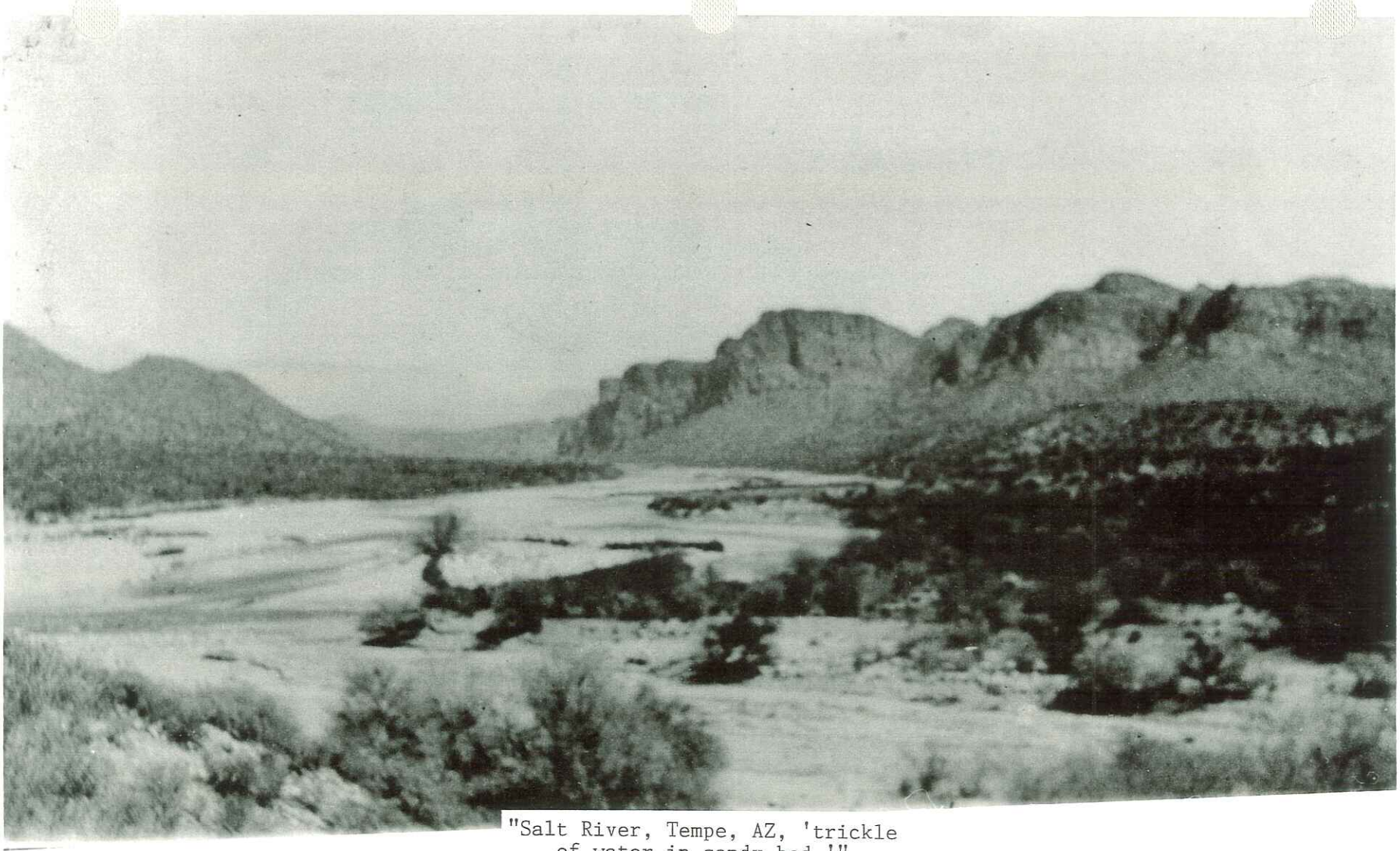
"Tempe Bridge over Salt River, railroad bridge in background," c. 1910, ASU, Hayden Library, Sp. Coll.



"Arizona Canal under
construction, flatboat in
river, Phoenix, AZ," c. 1885,
ASU, Hayden Library,
Sp. Coll.

Arizona Canal. Photo. by ROTHROCK & BARNETT.

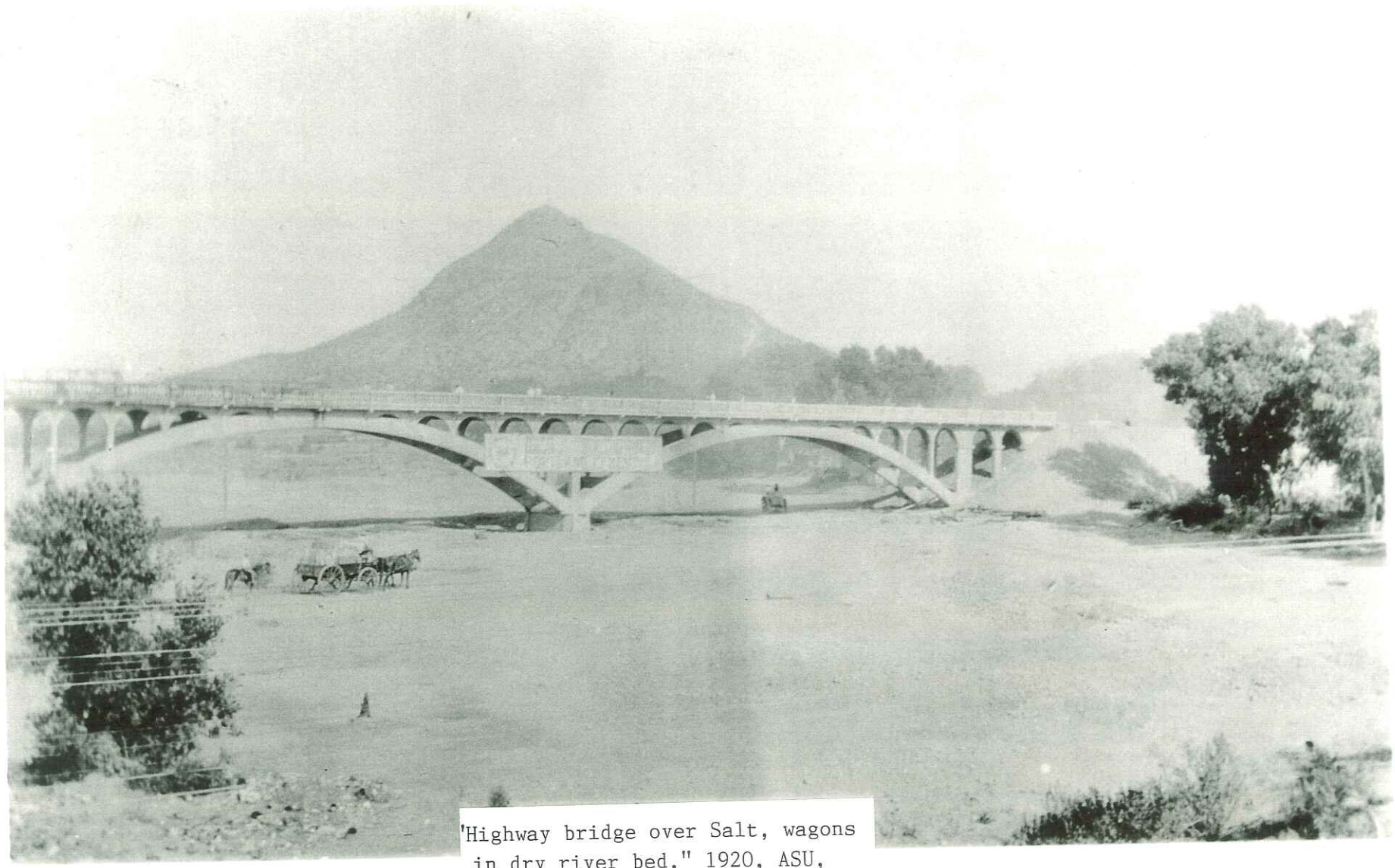
208



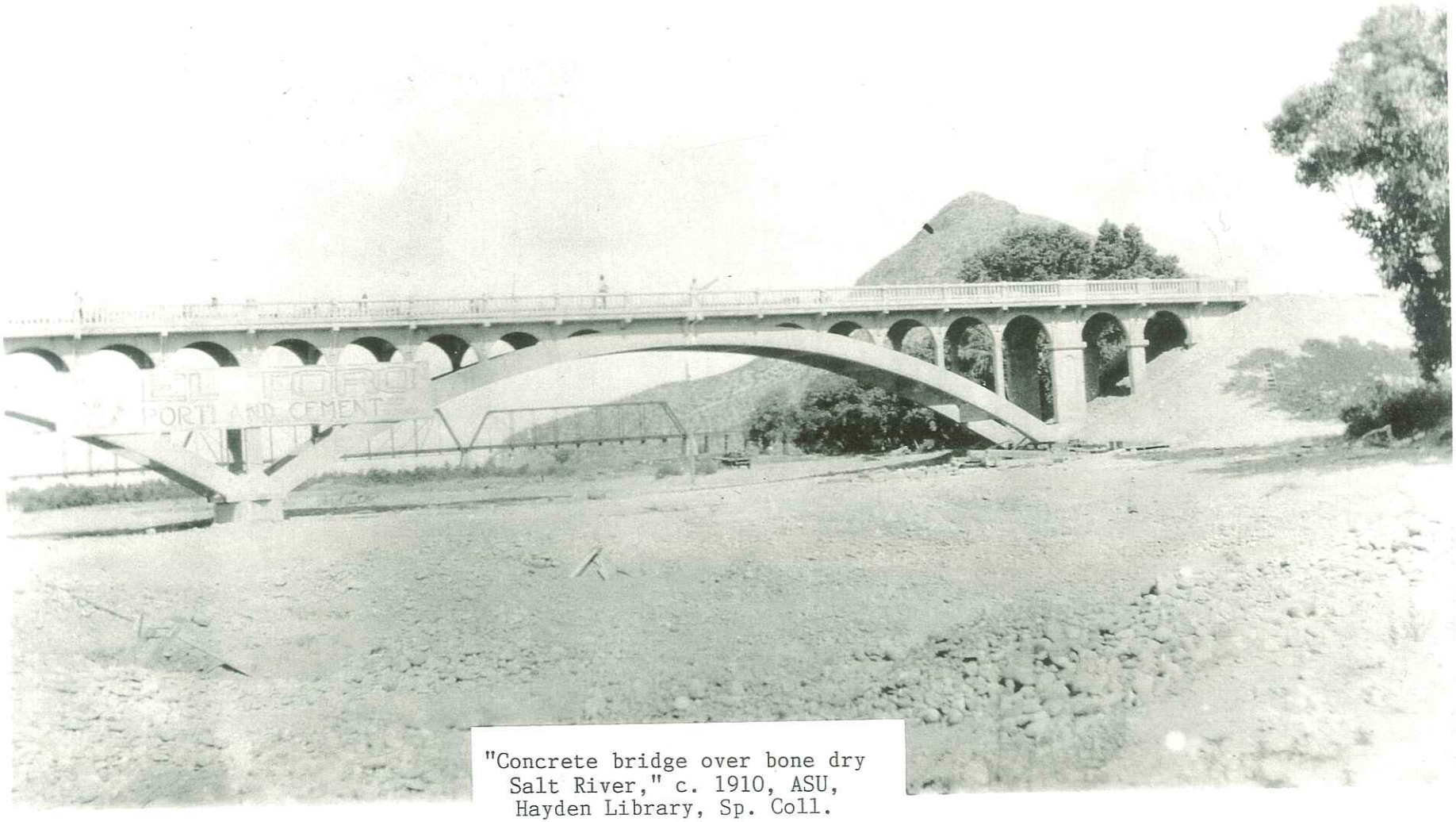
"Salt River, Tempe, AZ, 'trickle of water in sandy bed,'" c. 1905, ASU, Hayden Library, Sp. Coll.

"Two cars being towed across
Salt River," c. 1910,
ASU, Hayden Library, Sp. Coll.

"Car stalled in Salt River
Tempe, AZ," 1915, ASU, Hayden
Library, Sp. Coll.



'Highway bridge over Salt, wagons in dry river bed," 1920, ASU, Hayden Library, Sp. Coll.



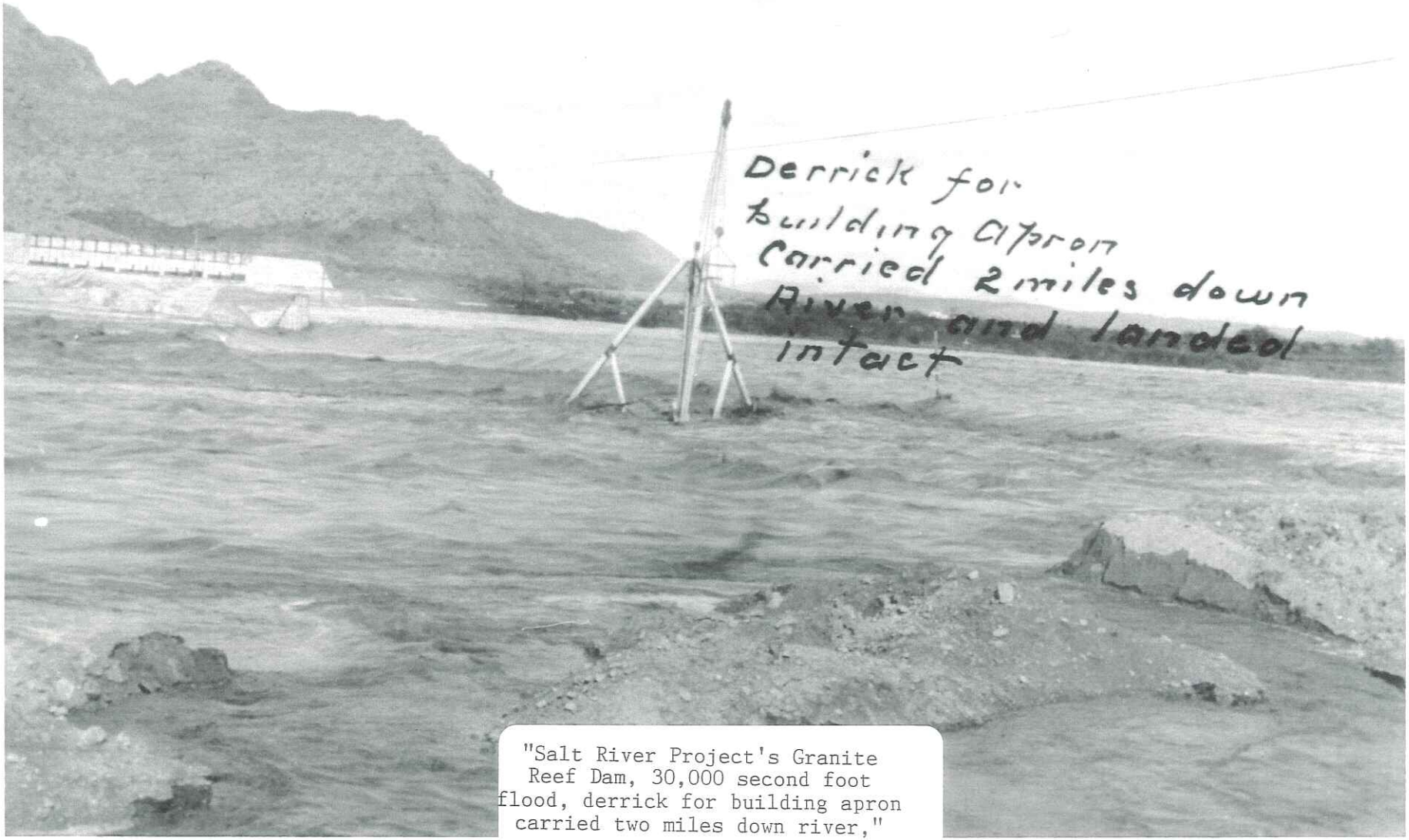
"Concrete bridge over bone dry Salt River," c. 1910, ASU, Hayden Library, Sp. Coll.

Salt River Project
Granite Reefs Dam
July 28, 08.

"Salt River Project's Granite Reef Dam," July 28, 1908, Salt River Project Archives

SRP

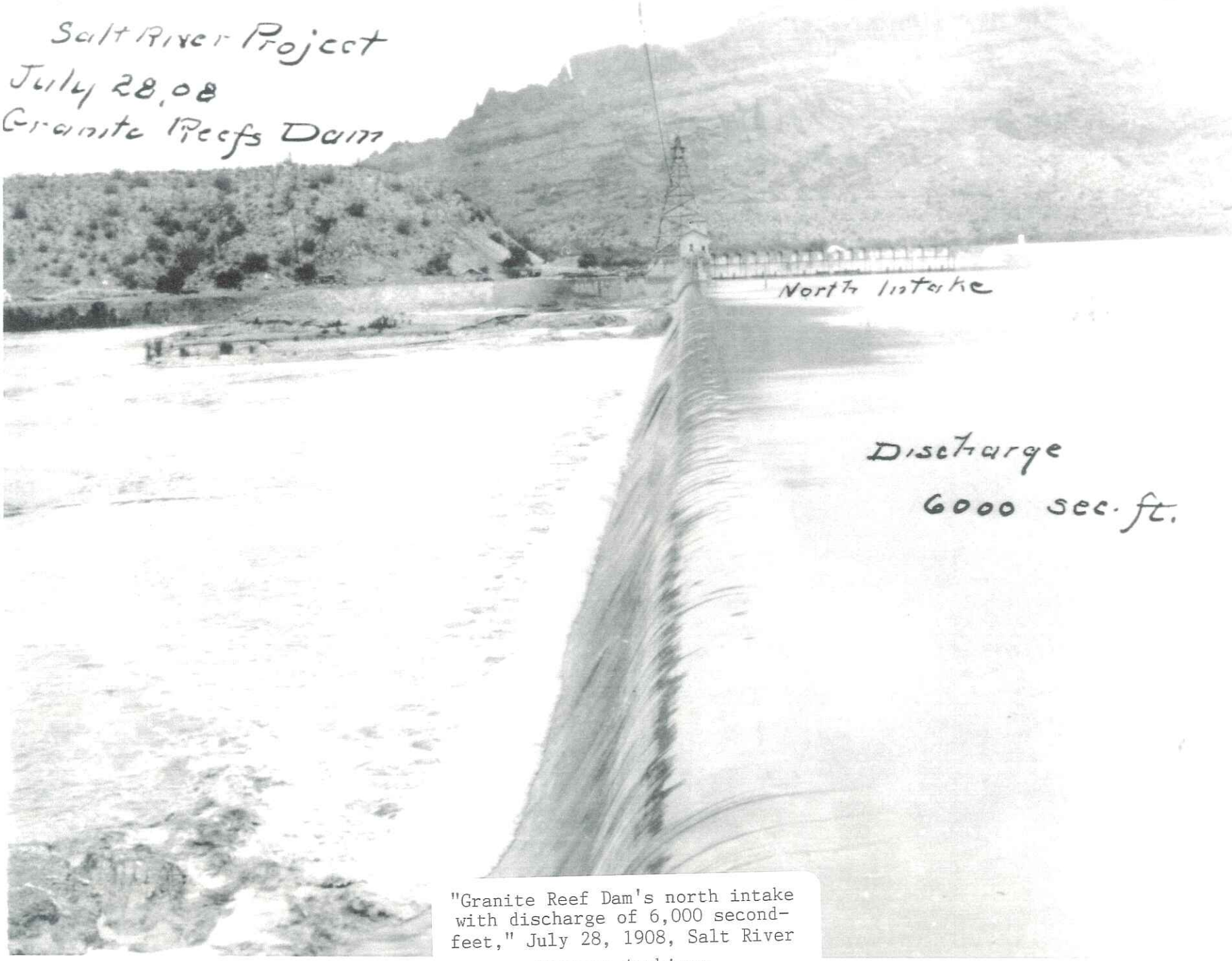
Salt River Project
Granite Reefs Dam
30 000 sec. ft. flood
Feb 4, 08.



"Salt River Project's Granite Reef Dam, 30,000 second foot flood, derrick for building apron carried two miles down river," Feb. 4, 1908, Salt River Project

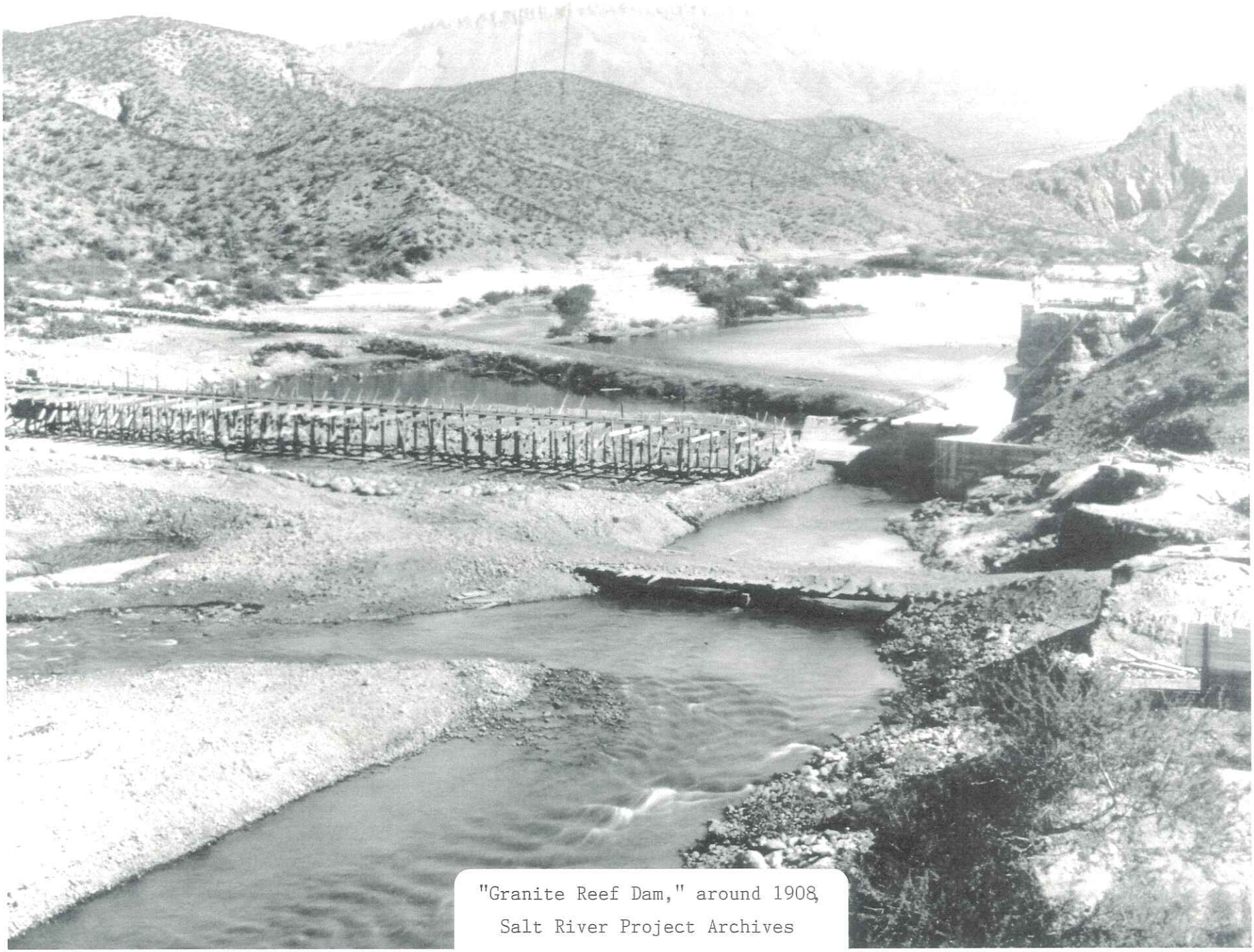
916

"Looking downstream from Granite Reef Dam, 30,000 second foot flood," Feb. 4, 1908, Salt River Project Archives



"Granite Reef Dam's north intake with discharge of 6,000 second-feet," July 28, 1908, Salt River Project Archives

812



"Granite Reef Dam," around 1908,
Salt River Project Archives

SUMMARY AND CONCLUSIONS

Since modern settlement began in the Salt River Valley in the mid-nineteenth century, there have been a multitude of documents created describing that stream. These cover a wide spectrum of published and unpublished sources, including federal and state (and territorial) materials, newspaper accounts, diaries, journals, reminiscences, and other archival records.

Some of the most important sources for ascertaining the nature of the Salt River prior to and at the time of Arizona's statehood in 1912 are survey field notes and plats created by U.S. government surveyors as they carried out their responsibilities mapping Arizona. Directed by manuals conveying precise instructions, surveyors were to make careful note of the region in which they were working, and they were provided with specific instructions about how to record the presence of navigable bodies of water. The area through which the Salt River flows below Granite Reef Dam and the confluence with the Gila River was fully surveyed in 1868, and resurveys were done for sections of the river in 1888, 1899, and 1910-1911. Significantly, although these surveys were undertaken by different parties at different times and under various seasonal conditions, none of the federal surveyors indicated in his field notes or on the related plats that the Salt River was navigable. On the contrary, their field notes and plats illustrated a stream that varied enormously in flow, that had a constantly changing channel, and that sank into the bed in places only to reemerge slightly downstream. Moreover, the notes and plats contain

references to roads parallelling the Salt, suggesting that transportation was carried out on land and not on the river.

Supporting the U.S. government surveys' determination that the Salt River was not navigable are federal government homestead patents, U.S. grants to Arizona, and Arizona's disposition of those lands. Over two hundred twenty-five patents were issued by the U.S. Government Land Office to parcels of land through which the Salt River or its bed ran. In every single case when these patents were formalized, the United States made no effort to deny title to the applicants based on a possible claim of ownership due to Arizona's sovereignty. In addition, in some cases the patent files that accompanied the applications made it clear that what the prospective homesteader wanted was the actual bed of the river itself. Furthermore, when lands were granted to Arizona through which the Salt River flowed, the state made no effort to obtain in-lieu selections for the acreage covered by the stream's bed -- as it would have been entitled to do had the Salt River been navigable at the time of statehood. And, when Arizona subsequently disposed of lands it had acquired from the federal government through which the Salt River ran, the state made no indication that it was withholding the bed of the river due to the public's interest.

The federal and state grant and patenting process is significant in relation to determining the Salt River's navigability because with so many different parcels and transfers of land involved, a large number of parties ultimately reached the

same conclusion -- that the Salt River was not navigable. Each applicant who requested land through which the river flowed implicitly asserted the river's non-navigability; each federal official approving a homestead application or grant to Arizona reached the same implicit conclusion, as did each state authority who sold Arizona's federally-granted lands. Not only did many individuals all indicate the same finding with regard to the Salt River's non-navigability, but they did so over a lengthy span of time, and their actions covered a large and diverse geographic area.

Further strengthening the finding that the Salt River was not navigable in 1912 are other published and unpublished records of the U.S. government. Records of the U.S. Reclamation Service, the Geological Survey, and the Department of Agriculture all described a stream that was extremely erratic in flows, unreliable in relation to channels, subject to severe floods, blocked by obstacles (both natural and man-made), prone to extensive seepage losses, and potentially dangerous. While the duties of the Reclamation Service, the Geological Survey, and the Department of Agriculture brought them most directly into contact with the Salt River, records generated by other federal agencies (notably, the Indian Service) substantiated these conclusions.

Newspapers also support the idea that the Salt was not navigable at statehood. While there were stories in the Phoenix-area press noting boating on the river, those articles emphasized how unusual such activities were, not how regularly they happened.

Moreover, the press stressed that roads and railroads carried commerce in the Salt River region, not the stream itself. And, of course, the newspapers took note of the tremendously destructive Salt River floods and how those altered the channel and surrounding landscape.

Much like the press, explorers' journals, personal reminiscences, private engineering reports and correspondence, other historical documents, and more recent historical studies all reached the same conclusion regarding the lack of navigability of the Salt River. Indeed, the Arizona Territorial Legislature, as one of its first acts in 1865, declared that the only stream in Arizona that was navigable was the Colorado, and Karen Smith, historian of the Salt River Project, declared in her seminal study of that federal undertaking that the Phoenix area had never had any port on a navigable body of water.

From this wealth of information, covering a huge array of documentary sources, only one conclusion can be reached: The Salt River was not navigable on or before February 14, 1912.

APPENDIX A -- UNPUBLISHED DOCUMENTS -- STATE ARCHIVES AND AGENCIES

ARIZONA STATE UNIVERSITY

FILE TITLE: Maricopa County Superior Court -- Nels Benson v. J Allison & . . . Others
COLLECTION: Hancock Family Collection
LOCATION: box 2, file 16
ARCHIVE: Arizona Historical Foundation, Tempe

FILE TITLE: Irrigation and Agricultural Practice in Arizona (R.H. Forbes)
COLLECTION: Hancock Family Collection
LOCATION: Box 2, Folder 19
ARCHIVE: Arizona Historical Foundation, Tempe

FILE TITLE: File 224
COLLECTION: Salt River Valley Water Users Association
LOCATION: Folder 224
ARCHIVE: Arizona Historical Foundation, Tempe

FILE TITLE: "Speech of Hon. Carl Hayden, of Arizona, in the House of Representatives, Thursday, February 3, 1916"
COLLECTION: Carl Hayden Papers, Mss. 001
LOCATION: folder 11, box 653
ARCHIVE: Arizona State University, Tempe

FILE TITLE: Hurley v. Abbott file
COLLECTION: Charles H. Woolf Papers, Mss. 821
LOCATION: folder 9a
ARCHIVE: Arizona State University, Tempe

FILE TITLE: "The Heritage of the Salt River Valley"
COLLECTION: Dorothy Robinson Papers, Mss. 69
LOCATION: folder 69, box 11
ARCHIVE: Arizona State University, Tempe

FILE TITLE: "Argument and Brief of The Highland Land and Water Company, a defendant," in the Case of M. Wormser, et al. v. The Salt River Valley Canal Company
COLLECTION: Grace-Joseph Alexander Papers, Mss. 11
LOCATION: folder 11, box 21
ARCHIVE: Arizona State University, Tempe

FILE TITLE: "Arizona Newspapers, Salt River"
COLLECTION: Newspapers
LOCATION: none
ARCHIVE: Arizona State University, Tempe

ARIZONA STATE ARCHIVES

FILE TITLE: "Folder 124"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 4
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "Folder 136"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 4
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "RG 59, 1913-1919, 54: 368"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 39
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "RG 59, 1913-1919, 54: 369"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 39
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "RG 59, 1913-1919, 54: 371"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 39
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "Combined Flow, Salt and Verde Rivers"
COLLECTION: Water Commissioner of Maricopa County
LOCATION: Microfilm Roll 137.1.5
ARCHIVE: Arizona State Archives, Phoenix

SALT RIVER PROJECT ARCHIVES

FILE TITLE: "HAER No. AZ-16, Tempe Canal, South Side of Salt River, Tempe, Mesa and Phoenix"
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "HAER No. AZ-19, Arizona Canal"
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "HAER No. AZ-8, San Francisco Canal"
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Notice of Lack of Jurisdiction and Request for Termination of Proceedings"
COLLECTION: none
LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Photographs, Written Historical and Descriptive Data, Reduced Copies of Drawings"
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Salt River Project, Arizona - Project History, Year 1911"
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: (1988) "An Historical Analysis of the Salt River, 1830-1912"
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: (April-May, 1915) Water Power Utilization in Arizona, "Part I, Introduction" and "Salt River & Smaller Tributaries"
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: Patrick T. Hurley v. Charles F. Abbott
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: Water Power Development papers, Misc.
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: M. Wormser, et al. vs. The Salt Valley Canal Co., et al.
COLLECTION: Court cases
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Statement of the Average Monthly Discharge of Salt River (In Miner's Inches) for the Years 1895-1902"
COLLECTION: Lynch Files
LOCATION: No. 206
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Ap. 21, 1903 to Ap. 16, 1904; p. 2450-2699"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Arizona Republic & Gazette, Aug. 19, 1906 to March 24, 1909"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Feb. 14, 1902 to Ap. 20, 1903; p. 2200-2449"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Jan. 1912 to Nov. 1912"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Newsclips 2/1904 - 10/1906"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Newspapers-Indexed, Selected Articles"
COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Accident" through "Distribution of Water"
COLLECTION: Zarbin Newspaper Collection (Alphabetical)
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Diversions" through "River"
COLLECTION: Zarbin Newspaper Collection (Alphabetical)
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Roads" through "Watershed"
COLLECTION: Zarbin Newspaper Collection (Alphabetical)
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

APPENDIX B -- UNPUBLISHED DOCUMENTS FROM FEDERAL AGENCIES, FEDERAL ARCHIVES, AND MISCELLANEOUS ARCHIVES

U.S. NATIONAL ARCHIVES, DENVER

FILE TITLE: "Annual Report of Operation and Maintenance for the Agricultural Year 1914-1915"
COLLECTION: Record Group 115
LOCATION: Engineering and Research Center Project Histories, 1911-1991, Box 158
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "History of the Project for the Calendar Year 1912"
COLLECTION: Record Group 115
LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "History of the Project for the Calendar Year 1913"
COLLECTION: Record Group 115
LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "History of the Project for the Calendar Year 1914"
COLLECTION: Record Group 115
LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "History of the Project for the Calendar Year 1915"
COLLECTION: Record Group 115
LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "Salt River Project, Arizona, Project History Year 1911"
COLLECTION: Record Group 115
LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "Salt River Project, Final History (to 1916)"
COLLECTION: Record Group 115
LOCATION: Engineering and Research Center Project Histories, 1911-1991, Box 142
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "Salt River Project-Annual Project History, 1916"
COLLECTION: Record Group 115

LOCATION: Engineering and Research Center Project Histories, 1911-1991, Box 142
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "Box No. 494"
COLLECTION: Record Group 115, Entry 10
LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "757-D1 Cooperation with Office of Indian Affairs. Gila River & Pima Ind. Res. Thru 1905."
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "118 SALT RIVER PROJECT. Settlement of Water Rights Thru 1913 118"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "118 SALT RIVER PROJECT. Settlement of Water Rights, 1914 thru June 1919 118"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "261 SALT RIVER PROJECT. Salt River Valley WUA, Thru May, 1903 261"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "27 SALT RIVER, Authorities for Construction."
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "305-15 SALT RIVER PROJECT. Misc. Water Supply for Lands of M.E. Braddock 305-15"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "54-B SALT RIVER. Lease of Water General 1911 Thru 1913 54-B"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "54-B3 SALT RIVER. Repayments: Corres. re: Furnishing Flood Waters to Water Users 54-B3"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineer Reports, January 1, 1907 - December 31, 1912."
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineers Reports, January 1, 1913 - December 31, 1913"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineers Reports, January 1, 1914 - December 31, 1914."
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Board of Survey Reports. 544-D"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Classification of Lands, Soil Surveys 559"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Corres. Re Board of Survey 544-D"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Corres. Re Board of Survey. Jan. 1, 1916 to 544-D"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Water Appropriations"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER. Acquisition of Lands. ARIZONA WATER CO. JAN. 1906 THRU"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER. Payments under Public Notice INDIAN LANDS 559-A1-"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "Salt River. Acquisition of Lands, Appropriators Canal Co."
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "Salt River. Acquisition of Lands. ARIZONA WATER CO. THRU 1905."
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

U.S. BUREAU OF LAND MANAGEMENT, PHOENIX

FILE TITLE: U.S. General Land Office Surveyor's Maps and Field Notes, Township 1 North, Range 1 East
COLLECTION: none
LOCATION: none
ARCHIVE: U.S. Bureau of Land Management, Arizona State Office, Phoenix

FILE TITLE: U.S. Land Office Surveyor's Field Notes, Township 1 North, Range 2 East
COLLECTION: none
LOCATION: none
ARCHIVE: U.S. Bureau of Land Management, Arizona State Office, Phoenix

FILE TITLE: U.S. Land Office Surveyor's Field Notes, Township 1 North, Range 3 East
COLLECTION: none
LOCATION: none
ARCHIVE: U.S. Bureau of Land Management, Arizona State Office, Phoenix

FILE TITLE: U.S. Land Office Surveyor's Field Notes, Township 1 North, Range 4 East
COLLECTION: none
LOCATION: none

ARCHIVE: U.S. Bureau of Land Management, Arizona State Office, Phoenix

FILE TITLE: U.S. General Land Office Surveyor's Plat and Field Notes, Township 1 North, Range 5 East
COLLECTION: none
LOCATION: none
ARCHIVE: U.S. Bureau of Land Management, Arizona State Office, Phoenix

FILE TITLE: U.S. Land Office Surveyor's Field Notes, Township 2 North, Range 5 East
COLLECTION: none
LOCATION: none
ARCHIVE: U.S. Bureau of Land Management, Arizona State Office, Phoenix

FILE TITLE: U.S. Land Office Surveyor's Field Notes, Township 2 North, Range 6 East
COLLECTION: none
LOCATION: none
ARCHIVE: U.S. Bureau of Land Management, Arizona State Office, Phoenix

U.S. NATIONAL ARCHIVES, WASHINGTON

FILE TITLE: "Reclamation Bureau, Salt River Project, Withdrawals & Restorations, March 4, 1908 to March 18, 1913"
COLLECTION: Record Group 48, Records of the Office of the Secretary of the Interior
LOCATION: Box 1648, Central Classified File, 1907-1936, 8-3, Salt River Sentinel"
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Reclamation Service, Salt River Project, Contracts, General, from April 22, 1907 to January 20, 1910"
COLLECTION: Record Group 48, Records of the Office of the Secretary of the Interior
LOCATION: Box 1644, Central Classified File, 1907-1936, 8-3, Salt River C-F
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Reclamation Service, Salt River Project, General, September 28, 1907 to June 10, 1911"
COLLECTION: Record Group 48, Records of the Office of the Secretary of the Interior
LOCATION: Box 1645, Central Classified File, 1907-1936, 8-3, Salt River, Gen.-R.
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Rio Grande, Rouge Canyon, Sacramento Valley, Saint Mary's River, Salt River"

COLLECTION: Record Group 48, Records of the Office of the Secretary of the Interior
LOCATION: Box 41, Records Relating to Specific Reclamation Projects, 1889-1907, Entry 631
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: Homestead Patent file for 350306, George F. Turner
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 362147, William J. Galbraith
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 381661, Thomas Rain
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 405842, Albert B. Harper
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 434353, Rawghlie C. Stanford
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 442932, George J. Awrey
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 442935, George W. Pike
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 444070, Manuel B. Gonzales
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 465160, John S. King
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 469157, Feliciano Gutierez

COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 470908, Delbert H. Thornton
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 489965, May Caulkins Cook
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 495328, Samuel Mahan
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 503185, Dennis M. Thornesberry
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 518079, George T. Kimbell
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 567440, John E. Clem
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 588981, James T. Littleton
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 591465, Margaret J. Dorn
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 607405, Charles Edwin Kirkpatrick
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 704051, Ira Jasper Richards

COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 725338, Thomas J. Parry
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Homestead Patent file for 728752, Orlando Merrill
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: Private Exchange Patent file for 1131653, Robert E. Jameson
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: Serial Land Patents
ARCHIVE: U.S. National Archives, Washington D.C.

FILE TITLE: "2868-16, 341, Part 3"
COLLECTION: Record Group 75, Bureau of Indian Affairs
LOCATION: Classified Files, 1907-1939, Pima, 89495-10-339 to 16721-10-341 Pt. 2
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Report on Underground Water Investigations Near Maricopa, Arizona, October, 1914."
COLLECTION: Record Group 75, Bureau of Indian Affairs
LOCATION: Classified Files, 1907-1939, Pima, 2868-16-341 Pts. 6 to 8
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "6629-12 Camp McDowell, File No. 341"
COLLECTION: Record Group 75, Bureau of Indian Affairs, Classification Files, 1907-1939, Salt River
LOCATION: Box 64268-20-321 - 97689-16-341
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Suit File, Sec. 26316-1912(?)"
COLLECTION: Record Group 75, Bureau of Indian Affairs, Classification Files, 1907-1939, Salt River
LOCATION: Box 64268-20-321 - 97689-16-341
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: illegible
COLLECTION: Record Group 75, Bureau of Indian Affairs, Classification Files, 1907-1939, Salt River
LOCATION: Box 64268-20-321 - 97689-16-341
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Report and Est, Irrigation System, Salt River, Jan. 17, 1917"
COLLECTION: Record Group 75, Entry 657, Bureau of Indian Affairs, Reports and Related Records, 1891-1946, Arizona: San Carlos Project, Salt River-Verde, 1910-41. Supplementary report on water Rights, Salt River Indian Res. to Brief to Buckeye Irrigation Co.
LOCATION: Box 49
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Report, Water Rights, Salt River Indian Reservation, Arizona"
COLLECTION: Record Group 75, Entry 657, Bureau of Indian Affairs, Reports and Related Records, 1891-1946, Arizona: San Carlos Project, Salt River-Verde, 1910-41. Supplementary report on water Rights, Salt River Indian Res. to Brief to Buckeye Irrigation Co.
LOCATION: Box 48
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: Surveyor's Contracts
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: none
ARCHIVE: U.S. National Archives, Washington, D.C.

WATER RESOURCES CENTER ARCHIVES, BERKELEY

FILE TITLE: An Economic Survey of Salt River Valley Project in Maricopa County, Arizona (1929)
COLLECTION: none
LOCATION: G 3562 E9
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: The Committee of Sixteen to the Salt River Valley Water User's Association
COLLECTION: none
LOCATION: none
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: 1500 Years of Irrigation History
COLLECTION: none
LOCATION: G 3562 G7
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: Address of Hon. Joseph H. Kibbey Delivered Before 15th National Irrigation Congress at Sacramento, CA., 09/04/1907
COLLECTION: none
LOCATION: G 3562 C7
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: U.S. Bureau of Reclamation, Salt River Valley Project, 1914-1915, Mead #30
COLLECTION: Elwood Mead Collection
LOCATION: 30
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: Report Upon the Development and Distribution of the Water Resources of Salt River Valley, Arizona
COLLECTION: Joseph B. Lippincott Collection
LOCATION: 52-2
ARCHIVE: Water Resources Center Archives, Berkeley

THE BANCROFT LIBRARY, BERKELEY

FILE TITLE: 38 c
COLLECTION: David Myrick Collection
LOCATION: MSS 68
ARCHIVE: Bancroft Library

APPENDIX C -- FEDERAL AND STATE PATENTS

FEDERAL PATENTS

LOCATION: Township 1N, Range 1E, Section 25
PATENT NUMBER: HE 1038964
DATE: 07/23/1930
PATENTEE: Jim Samson Hart

LOCATION: Township 1N, Range 1E, Section 25
PATENT NUMBER: CE 838
DATE: 01/11/1892
PATENTEE: Frederick P. Noack

LOCATION: Township 1N, Range 1E, Section 25
PATENT NUMBER: TC 31
DATE: 04/27/1898
PATENTEE: Silas M. Ivy

LOCATION: Township 1N, Range 1E, Section 25
PATENT NUMBER: CE PAT 704051
DATE: 08/29/1919
PATENTEE: Ira Jasper Richards

LOCATION: Township 1N, Range 1E, Section 25
PATENT NUMBER: HE 444070
DATE: 11/21/1914
PATENTEE: Manuel V. Gonzales

LOCATION: Township 1N, Range 1E, Section 25
PATENT NUMBER: HE 362147
DATE: 10/27/1913
PATENTEE: William J. Galbraith

LOCATION: Township 1N, Range 1E, Section 26
PATENT NUMBER: CE PAT 690
DATE: 10/16/1891
PATENTEE: Robert Whiteside

LOCATION: Township 1N, Range 1E, Section 26
PATENT NUMBER: CE PAT 967
DATE: 12/09/1892
PATENTEE: John W. Ambrose

LOCATION: Township 1N, Range 1E, Section 31
PATENT NUMBER: Rec. & PP Pat 02-73-0060
DATE: 05/11/1973
PATENTEE: State of Arizona

LOCATION: Township 1N, Range 1E, Section 31
PATENT NUMBER: HE 1072365
DATE: 09/26/1934

PATENTEE: Benjamin E. Cramer

LOCATION: Township 1N, Range 1E, Section 31
PATENT NUMBER: CE PAT 477253
DATE: 06/08/1915
PATENTEE: William E. Kay

LOCATION: Township 1N, Range 1E, Section 32
PATENT NUMBER: State School Pa 02-63-0148
DATE: 06/14/1963
PATENTEE: State of Arizona

LOCATION: Township 1N, Range 1E, Section 32
PATENT NUMBER: HE 265
DATE: 11/09/1891
PATENTEE: William F. Fickas

LOCATION: Township 1N, Range 1E, Section 33
PATENT NUMBER: Public Sale 1135780
DATE: 07/08/1952
PATENTEE: William J. Inke

LOCATION: Township 1N, Range 1E, Section 33
PATENT NUMBER: ITP 818474
DATE: 08/08/1921
PATENTEE: Henry Kavoca

LOCATION: Township 1N, Range 1E, Section 33
PATENT NUMBER: HE 861655
DATE: 05/03/1922
PATENTEE: Robert B. Stevens

LOCATION: Township 1N, Range 1E, Section 33
PATENT NUMBER: ITP 825315
DATE: 09/24/1921
PATENTEE: John Innie

LOCATION: Township 1N, Range 1E, Section 33
PATENT NUMBER: ITP 818309
DATE: 08/08/1921
PATENTEE: Samuel King

LOCATION: Township 1N, Range 1E, Section 34
PATENT NUMBER: ITP 818433
DATE: 08/08/1921
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 34
PATENT NUMBER: ITP 825149
DATE: 09/24/1921
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 34
PATENT NUMBER: ITP 825315
DATE: 09/24/1921
PATENTEE: John Innis

LOCATION: Township 1N, Range 1E, Section 34
PATENT NUMBER: CE PAT 1045
DATE: 04/07/1894
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 34
PATENT NUMBER: HE 602
DATE: 03/15/1894
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 34
PATENT NUMBER: ITP 818279
DATE: 08/08/1921
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 34
PATENT NUMBER: PS PAT 1129455
DATE: 07/14/1950
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 34
PATENT NUMBER: ITP 818477
DATE: 08/08/1921
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 35
PATENT NUMBER: HE 304938
DATE: 12/14/1912
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 35
PATENT NUMBER: HE 1044611
DATE: 03/06/1931
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 35
PATENT NUMBER: PS PAT 1126939
DATE: 08/04/1949
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 35
PATENT NUMBER: PS PAT 1129523
DATE: 07/26/1950
PATENTEE:

LOCATION: Township 1N, Range 1E, Section 35

PATENT NUMBER: HE 1037
DATE:
PATENTEE: Unknown

LOCATION: Township 1N, Range 1E, Section 35
PATENT NUMBER: ITP 1095744
DATE:
PATENTEE: Unknown

LOCATION: Township 1N, Range 2E, Section 20
PATENT NUMBER: TC PAT 6
DATE: 03/03/1893
PATENTEE: Henry E. Slosser

LOCATION: Township 1N, Range 2E, Section 20
PATENT NUMBER: HE 567440
DATE: 02/14/1917
PATENTEE: John E. Clem

LOCATION: Township 1N, Range 2E, Section 21
PATENT NUMBER: CE PAT 709
DATE: 10/16/1891
PATENTEE: James Keating

LOCATION: Township 1N, Range 2E, Section 21
PATENT NUMBER: HE 1074
DATE: 06/25/1901
PATENTEE: Emil Marquardt

LOCATION: Township 1N, Range 2E, Section 21
PATENT NUMBER: CE PAT 79
DATE: 05/31/1884
PATENTEE: Charles F. Bland

LOCATION: Township 1N, Range 2E, Section 21
PATENT NUMBER: CE PAT 542272
DATE: 08/14/1916
PATENTEE: Hugo J. Kroulik

LOCATION: Township 1N, Range 2E, Section 21
PATENT NUMBER: CE PAT 124
DATE: 05/31/1884
PATENTEE:

LOCATION: Township 1N, Range 2E, Section 22
PATENT NUMBER: CE PAT 542272
DATE: 08/14/1916
PATENTEE: Hugo J. Kroulik

LOCATION: Township 1N, Range 2E, Section 22
PATENT NUMBER: CE PAT 1000918
DATE: 04/28/1927

PATENTEE: Harry E. Cook

LOCATION: Township 1N, Range 2E, Section 22
PATENT NUMBER: HE 750177
DATE: 05/20/1920
PATENTEE: Ernest Hall

LOCATION: Township 1N, Range 2E, Section 22
PATENT NUMBER: CE PAT 257
DATE: 07/31/1888
PATENTEE: George U. Collins

LOCATION: Township 1N, Range 2E, Section 22
PATENT NUMBER: CE PAT 192
DATE: 10/19/1883
PATENTEE:

LOCATION: Township 1N, Range 2E, Section 23
PATENT NUMBER: CE PAT 783
DATE: 02/19/1895
PATENTEE: Augustus Redemill

LOCATION: Township 1N, Range 2E, Section 23
PATENT NUMBER: HE 111
DATE: 05/09/1907
PATENTEE: Joseph Severin

LOCATION: Township 1N, Range 2E, Section 23
PATENT NUMBER: ACT OF CONG PAT 832934
DATE: 11/18/1921
PATENTEE:

LOCATION: Township 1N, Range 2E, Section 23
PATENT NUMBER: HE 677876
DATE: 05/16/1919
PATENTEE: William H. Stilwell

LOCATION: Township 1N, Range 2E, Section 24
PATENT NUMBER: HE 678
DATE: 05/22/1895
PATENTEE: Thomas L. Short

LOCATION: Township 1N, Range 2E, Section 24
PATENT NUMBER: CE PAT 718513
DATE: 11/11/1919
PATENTEE:

LOCATION: Township 1N, Range 2E, Section 24
PATENT NUMBER: HE 607405
DATE: 11/12/1917
PATENTEE: Charles Edwin Kirkpatrick

LOCATION: Township 1N, Range 2E, Section 24
PATENT NUMBER: CE PAT 470908
DATE: 05/01/1915
PATENTEE: Delbert H. Thornton

LOCATION: Township 1N, Range 2E, Section 24
PATENT NUMBER: HE 653
DATE: 11/22/1894
PATENTEE:

LOCATION: Township 1N, Range 2E, Section 25
PATENT NUMBER: CE 450
DATE:
PATENTEE:

LOCATION: Township 1N, Range 2E, Section 26
PATENT NUMBER: HE 1072
DATE: 06/25/1901
PATENTEE: Unknown

LOCATION: Township 1N, Range 2E, Section 26
PATENT NUMBER: HE 1044
DATE:
PATENTEE:

LOCATION: Township 1N, Range 2E, Section 27
PATENT NUMBER: CE PAT 542
DATE: 05/10/1895
PATENTEE: Frank A. Phillips

LOCATION: Township 1N, Range 2E, Section 28
PATENT NUMBER: HE 521
DATE: 10/17/1892
PATENTEE: Millie Washburn

LOCATION: Township 1N, Range 2E, Section 28
PATENT NUMBER: CE PAT 775
DATE: 11/09/1891
PATENTEE: Alundio R. Leon

LOCATION: Township 1N, Range 2E, Section 28
PATENT NUMBER: HE 654182
DATE: 11/21/1918
PATENTEE: Francisco Yriarta

LOCATION: Township 1N, Range 2E, Section 29
PATENT NUMBER: HE 1019648
DATE: 10/03/1928
PATENTEE: Burt Scriven

LOCATION: Township 1N, Range 2E, Section 29
PATENT NUMBER: CE PAT 966

DATE: 04/12/1893
PATENTEE: Wesley McKee

LOCATION: Township 1N, Range 2E, Section 29
PATENT NUMBER: MIN 02-74-0021
DATE: 11/29/1973
PATENTEE: Alfred Norman Verrue

LOCATION: Township 1N, Range 2E, Section 29
PATENT NUMBER: HE 1017744
DATE: 07/24/1928
PATENTEE:

LOCATION: Township 1N, Range 2E, Section 29
PATENT NUMBER: CE PAT 479
DATE: 07/15/1890
PATENTEE: Charles Fox

LOCATION: Township 1N, Range 2E, Section 29
PATENT NUMBER: CE PAT 775
DATE: 11/09/1891
PATENTEE:

LOCATION: Township 1N, Range 2E, Section 29
PATENT NUMBER: PX PAT 1131653
DATE: 04/13/1951
PATENTEE: Robert E. Jameson

LOCATION: Township 1N, Range 2E, Section 30
PATENT NUMBER: CE PAT 218
DATE: 10/30/1875
PATENTEE: Antonio Lopez

LOCATION: Township 1N, Range 2E, Section 30
PATENT NUMBER: HE 1003405
DATE: 06/02/1927
PATENTEE: John James O'Shields

LOCATION: Township 1N, Range 2E, Section 30
PATENT NUMBER: HE 1121
DATE: 12/17/1901
PATENTEE: Cleotilde Zuniga

LOCATION: Township 1N, Range 2E, Section 30
PATENT NUMBER: HE 148
DATE: 09/06/1890
PATENTEE: Silas M. Ivy

LOCATION: Township 1N, Range 3E, Section 13
PATENT NUMBER: HE 974
DATE: 02/14/1900
PATENTEE: Ambrose Skinner

LOCATION: Township 1N, Range 3E, Section 13
PATENT NUMBER: HE 624553
DATE: 04/11/1918
PATENTEE: Francis M. Gordon

LOCATION: Township 1N, Range 3E, Section 13
PATENT NUMBER: HE 470
DATE: 04/16/1892
PATENTEE: Thomas R. Stewart

LOCATION: Township 1N, Range 3E, Section 13
PATENT NUMBER: HE 766
DATE: 12/22/1896
PATENTEE: Carlos Melendres

LOCATION: Township 1N, Range 3E, Section 13
PATENT NUMBER: AIRPORT PAT 02-85-0043
DATE: 01/09/1985
PATENTEE: City of Phoenix

LOCATION: Township 1N, Range 3E, Section 13
PATENT NUMBER: AIRPORT PAT 02-70-0085
DATE: 05/18/1970
PATENTEE: City of Phoenix

LOCATION: Township 1N, Range 3E, Section 13
PATENT NUMBER: AIRPORT PAT 02-68-0037
DATE: 01/12/1968
PATENTEE: City of Phoenix

LOCATION: Township 1N, Range 3E, Section 14
PATENT NUMBER: CE PAT 11
DATE: 04/10/1874
PATENTEE: Gordon A. Wilson

LOCATION: Township 1N, Range 3E, Section 14
PATENT NUMBER: CE PAT 736
DATE: 10/16/1891
PATENTEE: Martin Gold

LOCATION: Township 1N, Range 3E, Section 14
PATENT NUMBER: HE 69
DATE: 05/20/1885
PATENTEE: Sarah A. Edgar

LOCATION: Township 1N, Range 3E, Section 15
PATENT NUMBER: HE 475
DATE: 06/30/1892
PATENTEE: Catalina C. de Dominges

LOCATION: Township 1N, Range 3E, Section 15
PATENT NUMBER: CE PAT 9

DATE: 04/10/1874
PATENTEE: Michael Wormser

LOCATION: Township 1N, Range 3E, Section 15
PATENT NUMBER: HE 434353
DATE: 10/08/1914
PATENTEE: Rawhlie C. Stanford

LOCATION: Township 1N, Range 3E, Section 15
PATENT NUMBER: CE PAT 1041285
DATE: 10/15/1930
PATENTEE:

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: STATE SCH. PAT 02-63-0151
DATE: 06/21/1963
PATENTEE: State of Arizona

LOCATION: Township 1N, Range 3E, Section 17
PATENT NUMBER: CE PAT 663
DATE: 10/16/1891
PATENTEE: Rufus E. Farrington

LOCATION: Township 1N, Range 3E, Section 17
PATENT NUMBER: CE PAT 849
DATE: 01/11/1892
PATENTEE: Edward Askren

LOCATION: Township 1N, Range 3E, Section 17
PATENT NUMBER: CE PAT 465160
DATE: 03/27/1915
PATENTEE: John S. King

LOCATION: Township 1N, Range 3E, Section 17
PATENT NUMBER: CE PAT 432
DATE: 10/20/1891
PATENTEE: Harry Green

LOCATION: Township 1N, Range 3E, Section 18
PATENT NUMBER: TC 5
DATE:
PATENTEE: Unknown

LOCATION: Township 1N, Range 3E, Section 18
PATENT NUMBER: CE PAT 635 1/2
DATE: 10/16/1891
PATENTEE: John T. Hord

LOCATION: Township 1N, Range 3E, Section 19
PATENT NUMBER: HE 442935
DATE: 11/16/1914
PATENTEE: George W. Pike

LOCATION: Township 1N, Range 3E, Section 19
PATENT NUMBER: HE 611742
DATE: 12/14/1917
PATENTEE: Lemuel J. Wilkerson

LOCATION: Township 1N, Range 3E, Section 19
PATENT NUMBER: HE 588981
DATE: 06/22/1917
PATENTEE: James T. Littleton

LOCATION: Township 1N, Range 3E, Section 19
PATENT NUMBER: HE 159
DATE: 09/06/1890
PATENTEE: Hijinio Bernal

LOCATION: Township 1N, Range 3E, Section 20
PATENT NUMBER: CE PAT 489965
DATE: 09/13/1915
PATENTEE: May Caulkins Cook

LOCATION: Township 1N, Range 3E, Section 20
PATENT NUMBER: CE PAT 495328
DATE: 10/25/1915
PATENTEE: Samuel Mahan

LOCATION: Township 1N, Range 3E, Section 20
PATENT NUMBER: CE PAT 9
DATE: 06/20/1882
PATENTEE:

LOCATION: Township 1N, Range 3E, Section 20
PATENT NUMBER: HE 1206
DATE: 10/10/1905
PATENTEE: Dolores D. Quijada

LOCATION: Township 1N, Range 3E, Section 20
PATENT NUMBER: HE 603
DATE: 06/15/1894
PATENTEE: Aniseto Quijada

LOCATION: Township 1N, Range 3E, Section 20
PATENT NUMBER: HE 972
DATE: 11/20/1899
PATENTEE: Charles C. Reed

LOCATION: Township 1N, Range 3E, Section 20
PATENT NUMBER: HE 381661
DATE: 01/30/1914
PATENTEE: Thomas Rain

LOCATION: Township 1N, Range 3E, Section 20
PATENT NUMBER: CE PAT 788

DATE: 03/27/1893
PATENTEE: Samuel Gentry

LOCATION: Township 1N, Range 3E, Section 21
PATENT NUMBER: HE 810311
DATE: 06/16/1921
PATENTEE: Harry Anderson

LOCATION: Township 1N, Range 3E, Section 21
PATENT NUMBER: HE 469157
DATE: 04/20/1915
PATENTEE: Feliciano Gutierez

LOCATION: Township 1N, Range 3E, Section 21
PATENT NUMBER: CE PAT 591465
DATE: 07/09/1917
PATENTEE: Margaret J. Dorn

LOCATION: Township 1N, Range 3E, Section 21
PATENT NUMBER: HE 1071555
DATE: 08/15/1934
PATENTEE: Stephen B. Rayburn

LOCATION: Township 1N, Range 3E, Section 21
PATENT NUMBER: HE 1327
DATE: 01/30/1905
PATENTEE: Eseiso (sp?) Quijada

LOCATION: Township 1N, Range 3E, Section 21
PATENT NUMBER: HE 112
DATE: 05/23/1888
PATENTEE:

LOCATION: Township 1N, Range 3E, Section 22
PATENT NUMBER: HE 659644
DATE: 01/16/1919
PATENTEE: Assad Romley

LOCATION: Township 1N, Range 3E, Section 22
PATENT NUMBER: HE 113
DATE: 06/29/1891
PATENTEE: Michael Wormser

LOCATION: Township 1N, Range 3E, Section 22
PATENT NUMBER: HE 6
DATE: 11/10/1879
PATENTEE:

LOCATION: Township 1N, Range 3E, Section 23
PATENT NUMBER: HE 659642
DATE: 01/16/1919
PATENTEE: Mercer A. Richardson

LOCATION: Township 1N, Range 3E, Section 23
PATENT NUMBER: CE PAT 442
DATE: 04/08/1891
PATENTEE: Jesus Gonzales Y. Baldes

LOCATION: Township 1N, Range 3E, Section 23
PATENT NUMBER: CE PAT 962
DATE: 05/16/1892
PATENTEE: Manuel Ortiz

LOCATION: Township 1N, Range 3E, Section 23
PATENT NUMBER: HE 846439
DATE: 02/01/1922
PATENTEE: Roy H. Hinton

LOCATION: Township 1N, Range 3N, Section 24
PATENT NUMBER: HE 624553
DATE: 04/11/1918
PATENTEE: Francis M. Gordon

LOCATION: Township 1N, Range 3E, Section 24
PATENT NUMBER: HE 878
DATE: 12/12/1898
PATENTEE: Juana Valdes de Miranda

LOCATION: Township 1N, Range 3E, Section 24
PATENT NUMBER: HE 52
DATE: 06/20/1884
PATENTEE: Jesus Gonzles Y. Baldes

LOCATION: Township 1N, Range 3E, Section 24
PATENT NUMBER: CE PAT 10
DATE: 08/15/1884
PATENTEE:

LOCATION: Township 1N, Range 3E, Section 30
PATENT NUMBER: CE 91
DATE:
PATENTEE: Unknown

LOCATION: Township 1N, Range 4E, Section 7
PATENT NUMBER: HE 730
DATE: 04/23/1896
PATENTEE: Robert John Barthels

LOCATION: Township 1N, Range 4E, Section 7
PATENT NUMBER: HE 729
DATE: 04/23/1896
PATENTEE: James D. Morrell

LOCATION: Township 1N, Range 4E, Section 7
PATENT NUMBER: CE PAT 460

DATE: 12/15/1890
PATENTEE: Albert A. Clauson

LOCATION: Township 1N, Range 4E, Section 8
PATENT NUMBER: HE 903199
DATE: 04/13/1923
PATENTEE: Edward B. Rives

LOCATION: Township 1N, Range 4E, Section 8
PATENT NUMBER: HE 1159
DATE: 08/29/1902
PATENTEE: George W. Barnard

LOCATION: Township 1N, Range 4E, Section 9
PATENT NUMBER: CE PAT 856
DATE: 11/16/1891
PATENTEE: Edgear H. Jones

LOCATION: Township 1N, Range 4E, Section 9
PATENT NUMBER: FX PAT 9189
DATE: 04/30/1906
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 10
PATENT NUMBER: ITP 988315
DATE: 11/02/1926
PATENTEE: Lack

LOCATION: Township 1N, Range 4E, Section 10
PATENT NUMBER: CE PAT 531
DATE: 01/11/1892
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 11
PATENT NUMBER: FX PAT 5530
DATE: 01/14/1904
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 11
PATENT NUMBER: DLE PAT 970644
DATE: 12/09/1925
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988327
DATE: 11/02/1926
PATENTEE: Molly Cheerless Osif

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988301
DATE: 11/02/1926
PATENTEE: Mary Anna Charley

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988332
DATE: 11/02/1926
PATENTEE: Henry Solanna

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988300
DATE: 11/02/1926
PATENTEE: Charley

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988306
DATE: 11/02/1926
PATENTEE: Jose Henry

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988313
DATE: 11/02/1926
PATENTEE: Jose Kisto

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988314
DATE: 11/02/1926
PATENTEE: Annie Kisto

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988334
DATE: 11/02/1926
PATENTEE: Jenny Too-um-cum

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988331
DATE: 11/02/1926
PATENTEE: Juan Chiago Solanna

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988326
DATE: 11/02/1926
PATENTEE: Analda Osif

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988297
DATE: 11/02/1926
PATENTEE: Louis Bee

LOCATION: Township 1N, Range 4E, Section 12
PATENT NUMBER: ITP 988333
DATE: 11/02/1926
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 13
PATENT NUMBER: CE PAT 503185

DATE: 12/11/1915
PATENTEE: Dennis Thornesberry

LOCATION: Township 1N, Range 4E, Section 13
PATENT NUMBER: HE 725338
DATE: 01/03/1920
PATENTEE: Thomas J. Parry

LOCATION: Township 1N, Range 4E, Section 13
PATENT NUMBER: HE 485
DATE: 08/27/1892
PATENTEE: Jesus Miranda

LOCATION: Township 1N, Range 4E, Section 13
PATENT NUMBER: SX PAT 1129548
DATE: 07/28/1950
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 13
PATENT NUMBER: HE 518079
DATE: 03/09/1916
PATENTEE: George T. Kimbell

LOCATION: Township 1N, Range 4E, Section 13
PATENT NUMBER: HE 212
DATE: 07/03/1890
PATENTEE: Manuel Gonzales

LOCATION: Township 1N, Range 4E, Section 14
PATENT NUMBER: TC PAT 10
DATE: 05/16/1893
PATENTEE: Pedro Sodillo

LOCATION: Township 1N, Range 4E, Section 14
PATENT NUMBER: CE PAT 614 1/2
DATE: 11/16/1891
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 14
PATENT NUMBER: CE PAT 531
DATE: 01/11/1892
PATENTEE: Stephen Stanley

LOCATION: Township 1N, Range 4E, Section 14
PATENT NUMBER: HE 725338
DATE: 01/03/1920
PATENTEE: Thomas J. Parry

LOCATION: Township 1N, Range 4E, Section 14
PATENT NUMBER: PATENT SX 02-92-0015
DATE: 03/30/1992
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 14
PATENT NUMBER: HE 749235
DATE: 05/14/1920
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 14
PATENT NUMBER: HE 22
DATE: 01/20/1883
PATENTEE: Charles Trumbull Hayden

LOCATION: Township 1N, Range 4E, Section 15
PATENT NUMBER: MIN 1151612
DATE: 04/15/1955
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 15
PATENT NUMBER: HE 1455
DATE: 02/28/1906
PATENTEE:

LOCATION: Township 1N, Range 4E, Section 15
PATENT NUMBER: CE PAT 532
DATE: 01/11/1892
PATENTEE: Francis B. Austin

LOCATION: Township 1N, Range 4E, Section 15
PATENT NUMBER: CE PAT 50
DATE: 10/20/1875
PATENTEE: Charles Trumbull Hayden

LOCATION: Township 1N, Range 4E, Section 16
PATENT NUMBER: STATE SCHOOL PA 02-63-0154
DATE: 06/25/1963
PATENTEE: State of Arizona

LOCATION: Township 1N, Range 4E, Section 17
PATENT NUMBER: HE 720
DATE: 02/06/1896
PATENTEE: Juan M. Gonzales

LOCATION: Township 1N, Range 4E, Section 17
PATENT NUMBER: HE 242
DATE:
PATENTEE: Unknown

LOCATION: Township 1N, Range 4E, Section 18
PATENT NUMBER: CE PAT 638 1/4
DATE: 10/20/1891
PATENTEE: Felis Gallardo

LOCATION: Township 1N, Range 4E, Section 18
PATENT NUMBER: AIRPORT PAT 1218854

DATE: 03/15/1961
PATENTEE: City of Phoenix

LOCATION: Township 1N, Range 4E, Section 18
PATENT NUMBER: AIRPORT PAT 02-85-0043
DATE: 01/09/1985
PATENTEE: City of Phoenix

LOCATION: Township 1N, Range 4E, Section 18
PATENT NUMBER: HE 683043
DATE: 06/05/1919
PATENTEE: Charles R. Hill

LOCATION: Township 1N, Range 4E, Section 18
PATENT NUMBER: AIRPORT PAT 02-70-0085
DATE: 05/18/1970
PATENTEE: City of Phoenix

LOCATION: Township 1N, Range 4E, Section 18
PATENT NUMBER: HE 442932
DATE: 11/16/1914
PATENTEE: George J. Awrey

LOCATION: Township 1N, Range 4E, Section 18
PATENT NUMBER: DLE PAT 836145
DATE: 12/01/1921
PATENTEE: George K. Wood

LOCATION: Township 1N, Range 5E, Section 3
PATENT NUMBER: RHE 728752
DATE: 01/20/1920
PATENTEE: Orlando Merrill

LOCATION: Township 1N, Range 5E, Section 3
PATENT NUMBER: HE 405842
DATE: 05/15/1914
PATENTEE: Albert B. Harper

LOCATION: Township 1N, Range 5E, Section 3
PATENT NUMBER: CE 554
DATE: 06/13/1891
PATENTEE: Syrina Steele

LOCATION: Township 1N, Range 5E, Section 3
PATENT NUMBER: CE 1086
DATE: 08/02/1895
PATENTEE: Charles G. Shill

LOCATION: Township 1N, Range 5E, Section 3
PATENT NUMBER: HE 165
DATE: 09/06/1890
PATENTEE: Harvey J. Harper

LOCATION: Township 1N, Range 5E, Section 4
PATENT NUMBER: ITP 387213
DATE: 02/25/1914
PATENTEE: Miguel Helice

LOCATION: Township 1N, Range 5E, Section 4
PATENT NUMBER: ITP 387211
DATE: 02/25/1914
PATENTEE: Mollie Santo Helice

LOCATION: Township 1N, Range 5E, Section 4
PATENT NUMBER: ITP 387102
DATE: 02/25/1914
PATENTEE: Joseph Emerson

LOCATION: Township 1N, Range 5E, Section 4
PATENT NUMBER: ITP 387519
DATE: 02/25/1914
PATENTEE:

LOCATION: Township 1N, Range 5E, Section 4
PATENT NUMBER: ITP 387036
DATE: 02/25/1914
PATENTEE: Juan Vavages Burton

LOCATION: Township 1N, Range 5E, Section 4
PATENT NUMBER: HE 418
DATE: 11/16/1895
PATENTEE: William Schwarz

LOCATION: Township 1N, Range 5E, Section 4
PATENT NUMBER: HE 1108
DATE: 10/23/1901
PATENTEE: Elton E. Miller

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 988330
DATE: 11/02/1926
PATENTEE: Juana Rosa Soy

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387524
DATE: 02/25/1914
PATENTEE: Baptisto Soy

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387241
DATE: 02/25/1914
PATENTEE: Maggie Jefferson

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387018

DATE: 02/25/1914
PATENTEE: Eunice Bliss

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387404
DATE: 02/25/1914
PATENTEE: Juna Memson

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387326
DATE: 02/25/1914
PATENTEE: Francisco Lewis

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 910265
DATE: 06/27/1923
PATENTEE: Mary Johnson

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387166
DATE: 02/25/1914
PATENTEE: John Francisco

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387115
DATE: 02/25/1914
PATENTEE: Lucy Enos #2

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387256
DATE: 02/25/1914
PATENTEE: Richard Johnson

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387549
DATE: 02/25/1914
PATENTEE: Effie Taylor

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387585
DATE: 02/25/1914
PATENTEE: Manley Waypakie

LOCATION: Township 1N, Range 5E, Section 5
PATENT NUMBER: ITP 387447
DATE: 02/25/1914
PATENTEE: John Norris

LOCATION: Township 1N, Range 5E, Section 6
PATENT NUMBER: ITP 387458
DATE: 02/25/1914
PATENTEE:

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387561
DATE: 02/25/1914
PATENTEE: Too-um-cum

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 386990
DATE: 02/25/1914
PATENTEE: Alice Baptist

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387476
DATE: 02/25/1914
PATENTEE: Mary Ignacia Roy

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387192
DATE: 02/25/1914
PATENTEE: Louis Hanah

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387555
DATE: 02/25/1914
PATENTEE: Susan Thomas

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387351
DATE: 02/25/1914
PATENTEE: Manily Manuel

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 386992
DATE: 02/25/1914
PATENTEE: Fanny Baptist

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 386989
DATE: 02/25/1914
PATENTEE: John Baptist

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 386966
DATE: 02/25/1914
PATENTEE: Robert Anton

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387352
DATE: 02/25/1914
PATENTEE: Martina Manuel

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387480

DATE: 02/25/1914
PATENTEE: Mich Roy

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387222
DATE: 02/25/1914
PATENTEE: Ignacia

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387545
DATE: 02/25/1914
PATENTEE: Benjamin Taylor

LOCATION: Township 1N, Range 5E, Section 7
PATENT NUMBER: ITP 387193
DATE: 02/25/1914
PATENTEE: Josefa Hanah

LOCATION: Township 1N, Range 5E, Section 8
PATENT NUMBER: HE 160
DATE: 07/03/1890
PATENTEE: Robert B. Carley

LOCATION: Township 1N, Range 5E, Section 8
PATENT NUMBER: HE 981
DATE: 02/14/1900
PATENTEE: Hiram Gilbert

LOCATION: Township 1N, Range 5E, Section 8
PATENT NUMBER: MIN 02-82-0006
DATE: 12/11/1981
PATENTEE:

LOCATION: Township 1N, Range 5E, Section 8
PATENT NUMBER: MIN 02-82-0005
DATE: 12/11/1981
PATENTEE:

LOCATION: Township 1N, Range 5E, Section 8
PATENT NUMBER: MIN 02-82-0007
DATE: 12/11/1981
PATENTEE:

LOCATION: Township 1N, Range 5E, Section 8
PATENT NUMBER: CE PAT 1146
DATE: 04/23/1896
PATENTEE:

LOCATION: Township 1N, Range 5E, Section 8
PATENT NUMBER: HE 873498
DATE: 07/21/1922
PATENTEE: William W. Wood

LOCATION: Township 1N, Range 5E, Section 8
PATENT NUMBER: HE 66
DATE: 05/20/1885
PATENTEE:

LOCATION: Township 1N, Range 5E, Section 9
PATENT NUMBER: MIN PAT 02-83-0046
DATE: 06/13/1983
PATENTEE:

LOCATION: Township 1N, Range 5E, Section 9
PATENT NUMBER: CE PAT 994
DATE: 01/21/1893
PATENTEE:

LOCATION: Township 1N, Range 5E, Section 18
PATENT NUMBER: CE 939
DATE: 06/25/1892
PATENTEE: John D. Spooner

LOCATION: Township 1N, Range 5E, Section 18
PATENT NUMBER: HE 1064960
DATE: 07/06/1933
PATENTEE: Ferdinand C. Smith

LOCATION: Township 1N, Range 5E, Section 18
PATENT NUMBER: HE 350306
DATE: 08/14/1913
PATENTEE: George F. Turner

LOCATION: Township 1N, Range 5E, Section 18
PATENT NUMBER: HE 518079
DATE: 03/09/1916
PATENTEE: George T. Kimbell

LOCATION: Township 1N, Range 5E, Section 18
PATENT NUMBER: CE 935
DATE: 06/25/1892
PATENTEE: Boon Lewis

LOCATION: Township 1N, Range 5E, Section 18
PATENT NUMBER: CE 88
DATE: 11/10/1877
PATENTEE: Nathaniel Sharp

LOCATION: Township 2N, Range 5E, Section 25
PATENT NUMBER: ITP 1229038
DATE: 02/14/1963
PATENTEE: Eleanor Kavoka Lewis

LOCATION: Township 2N, Range 5E, Section 25
PATENT NUMBER: ITP 878689

DATE: 09/07/1922
PATENTEE: James Kistova

LOCATION: Township 2N, Range 5E, Section 25
PATENT NUMBER: ITP 387622
DATE: 02/25/1914
PATENTEE: Henry Panso

LOCATION: Township 2N, Range 5E, Section 25
PATENT NUMBER: ITP 878660
DATE: 09/07/1922
PATENTEE: Joe Hice

LOCATION: Township 2N, Range 5E, Section 25
PATENT NUMBER: ITP 988341
DATE: 11/02/1926
PATENTEE: Joseph Gates

LOCATION: Township 2N, Range 5E, Section 25
PATENT NUMBER: 878690
DATE: 09/07/1922
PATENTEE: Manuella Kistova

LOCATION: Township 2N, Range 5E, Section 25
PATENT NUMBER: ITP 387639
DATE: 02/25/1914
PATENTEE: Harry Washington

LOCATION: Township 2N, Range 5E, Section 25
PATENT NUMBER: ITP 988362
DATE: 11/02/1926
PATENTEE: Waller Miles

LOCATION: Township 2N, Range 5E, Section 26
PATENT NUMBER: ITP 387446
DATE: 02/25/1914
PATENTEE: Chester Nelson

LOCATION: Township 2N, Range 5E, Section 26
PATENT NUMBER: ITP 387503
DATE: 02/25/1914
PATENTEE:

LOCATION: Township 2N, Range 5E, Section 26
PATENT NUMBER: ITP 1066697
DATE: 10/26/1933
PATENTEE: Louisa Santeo

LOCATION: Township 2N, Range 5E, Section 26
PATENT NUMBER: ITP 387626
DATE: 02/25/1914
PATENTEE: William Phillips

LOCATION: Township 2N, Range 5E, Section 26
PATENT NUMBER: ITP 988357
DATE: 11/02/1926
PATENTEE: Ivy Phillips

LOCATION: Township 2N, Range 5E, Section 27
PATENT NUMBER: ITP 387397
DATE: 02/25/1914
PATENTEE:

LOCATION: Township 2N, Range 5E, Section 33
PATENT NUMBER: ITP 387367
DATE: 02/25/1914
PATENTEE: Edith Manuel

LOCATION: Township 2N, Range 5E, Section 33
PATENT NUMBER: ITP 387365
DATE: 02/25/1914
PATENTEE: Joseph Manuel

LOCATION: Township 2N, Range 5E, Section 33
PATENT NUMBER: ITP 387505
DATE: 02/25/1914
PATENTEE: Lucy Santo

LOCATION: Township 2N, Range 5E, Section 33
PATENT NUMBER: ITP 387368
DATE: 02/25/1914
PATENTEE: Agnes Manuel

LOCATION: Township 2N, Range 5E, Section 34
PATENT NUMBER: ITP 387339
DATE: 02/25/1914
PATENTEE: Siblin Logie

LOCATION: Township 2N, Range 5E, Section 34
PATENT NUMBER: ITP 387419
DATE: 02/25/1914
PATENTEE: Ida Moore

LOCATION: Township 2N, Range 5E, Section 34
PATENT NUMBER: ITP 988316
DATE: 11/02/1926
PATENTEE: Stella Logie

LOCATION: Township 2N, Range 5E, Section 34
PATENT NUMBER: CE PAT 558
DATE: 08/24/1896
PATENTEE: Lovina V. Davis

LOCATION: Township 2N, Range 5E, Section 35
PATENT NUMBER: ITP 878622

DATE: 09/07/1922
PATENTEE: Howard Chiago

LOCATION: Township 2N, Range 5E, Section 35
PATENT NUMBER: ITP 988351
DATE: 11/02/1926
PATENTEE: Wilford Juan

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 387632
DATE: 02/25/1914
PATENTEE: Margaret Smith

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 988349
DATE: 11/02/1926
PATENTEE: Sadie Juan

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 387630
DATE: 02/25/1914
PATENTEE: Fanny Smith

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 387620
DATE: 02/25/1914
PATENTEE: Evelina Miles

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 387631
DATE: 02/25/1914
PATENTEE: Guy Smith

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 988348
DATE: 11/02/1926
PATENTEE: Domingo Jose Juan

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 988350
DATE: 11/02/1926
PATENTEE: Henry Juan

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 387629
DATE: 02/25/1914
PATENTEE: Violet Smith

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 387619
DATE: 02/25/1914
PATENTEE: Margaret Miles

LOCATION: Township 2N, Range 6E, Section 19
PATENT NUMBER: ITP 387618
DATE: 02/25/1914
PATENTEE: Nelson Miles

LOCATION: Township 2N, Range 6E, Section 29
PATENT NUMBER: RHE 700145
DATE:
PATENTEE: Unknown

LOCATION: Township 2N, Range 6E, Section 29
PATENT NUMBER: RHE 819510
DATE:
PATENTEE: Unknown

LOCATION: Township 2N, Range 6E, Section 30
PATENT NUMBER: RHE 700125
DATE: 07/23/1919
PATENTEE: Art Otto Pasley

LOCATION: Township 2N, Range 6E, Section 30
PATENT NUMBER: CE PAT 576
DATE: 10/16/1891
PATENTEE: Oscar Crismon

STATE PATENTS

LOCATION: Township 1N, Range 1 E, Section 34
PATENT NUMBER: "GF" 38861
DATE: 11/22/1946
PATENTEE: M.B. Cheney

LOCATION: Township 1N, Range 1E, Section 36
PATENT NUMBER: State School 662
DATE: 03/21/1923
PATENTEE: Eugene D. Goldman

LOCATION: Township 1N, Range 1E, Section 36
PATENT NUMBER: State School 659
DATE: 03/21/1923
PATENTEE: M.B. Harovitz

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: State School 1338
DATE: 12/13/1928
PATENTEE: Alfred Williams and Thomas J. Bishop

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: State School 1685
DATE: 11/03/1931
PATENTEE: Thomas E. Bonner

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: State School 5
DATE: 05/05/1916
PATENTEE: Ezra W. Thayer

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: State School 217
DATE: 09/23/1918
PATENTEE: Jean Orteig

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: Grant SL 2046
DATE: 10/13/1938
PATENTEE: Jean Orteig

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: Grant SL 2081
DATE: 03/20/1939
PATENTEE: Frank Luke

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: State School 218
DATE: 09/23/1918
PATENTEE: Jean Orteig

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: S 3998
DATE: 06/10/1947
PATENTEE: Epifanio Figueroa

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: State School 1394
DATE: 04/03/1929
PATENTEE: Agnes Hunt Parke

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: School Grant SL 1902
DATE: 11/06/1936
PATENTEE: Contractors Schmidt-Hitchcock

LOCATION: Township 1N, Range 3E, Section 16
PATENT NUMBER: State School 1686
DATE: 11/03/1931
PATENTEE: John Bonner

LOCATION: Township 1N, Range 4E, Section 16
PATENT NUMBER: S 1841
DATE: 10/01/1935
PATENTEE: City of Tempe

LOCATION: Township 1N, Range 4E, Section 16
PATENT NUMBER: Grant SL 2559
DATE: 06/29/1942
PATENTEE: E.M. White

LOCATION: Township 1N, Range 4E, Section 16
PATENT NUMBER: School 809
DATE: 03/23/1925
PATENTEE: J.M Perry

LOCATION: Township 1N, Range 4E, Section 16
PATENT NUMBER: School 1555
DATE: 03/14/1930
PATENTEE: Frank Luke

LOCATION: Township 1N, Range 4E, Section 16
PATENT NUMBER: School 650
DATE: 02/16/1923
PATENTEE: Frederick S. Stephen

LOCATION: Township 1N, Range 4E, Section 16
PATENT NUMBER: "S" 4007
DATE: 06/18/1947
PATENTEE: Pedro C. Celaya

LOCATION: Township 1N, Range 4E, Section 16
PATENT NUMBER: School 1426

DATE: 05/06/1929
PATENTEE: Southwestern Packing Company

LOCATION: Township 2N, Range 6E, Section 23
PATENT NUMBER: 031 54-98588-01
DATE: 07/03/1990
PATENTEE: Salt River Pima-Maricopa Indian Community

APPENDIX D -- PUBLISHED SOURCES

BOOKS, GOVERNMENT REPORTS, STATUTES, AND COURT CASES

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Myers, John. "The Salt's Navy Attests to a Once-Moist River," in Arizona Days and Ways (12/09/1956).

APPENDIX E -- VITA OF DOUGLAS R. LITTLEFIELD

Littlefield Research Associates
6207 Snake Road
Oakland, California 94611
Telephone: (510) 339-1017

EDUCATION:

Ph.D. American history. University of California, Los Angeles, 1987. Dissertation: "Interstate Water Conflicts, Compromises, and Compacts: The Rio Grande."

M.A. American history. University of Maryland, College Park, 1979. Master's thesis: "A History of the Potomac Company and Its Colonial Predecessors."

B.A. English literature. Brown University, 1972.

CONSULTING AND EXPERT WITNESS EXPERIENCE:

1995 - Present: Research historian and consultant for the Salt River Project (Arizona). Providing historical documentation and report on the commercial navigability of the Salt, Gila, and Verde rivers in 1912 for use in relation to hearings in front of the Arizona Navigable Stream Adjudication Commission.

1995 - Present: Research historian and consultant for Nebraska Department of Water Resources. Providing historical documentation and report on the history of Nebraska v. Wyoming, 325 U.S. 589 (1945), for use in present litigation between Nebraska and Wyoming over the apportionment of the waters of the North Platte River.

1993 - 1994: Research historian and consultant for Simms and Stein, attorneys specializing in water law in Santa Fe, New Mexico. Providing historical documentation and affidavit testimony for use in In re: the General Adjudication of All Rights to Use Water in the Big Horn River System and All Other Sources, State of Wyoming (presently on appeal to the Wyoming Supreme Court as Nos. 94-58 to 94-63).

1991 - Present: Research historian and consultant for Legal Counsel, Division of Water Resources, Kansas State Board of Agriculture. Providing historical documentation and report on water rights and history of apportionment of Republican River among Kansas, Nebraska, and Colorado.

1991 - 1993: Research historian and consultant for Carlsmith, Ball, Wichman, Murray, Case, Mukai & Ichiki, in Long Beach, California. Provided historical documentation and report for use in Nickel Enterprises v. State of California, Kern County Superior Court, Case No. 199557, regarding past uses of Kern River. Testified as an expert witness historian in this case for eleven days.

1989 - 1990: Research historian for Pacific Enterprises, Los Angeles, California. Directed historical research for and coauthored a corporate history of this southern California holding company entitled The Spirit of Enterprise: A History of Pacific Enterprises, 1867-1989 (1990).

1988 - 1989: Research historian and consultant for Water Defense Association, Roswell, New Mexico. Provided historical documentation on the history of water rights claims along the Bonito, Hondo, and Ruidoso rivers in southeastern New Mexico for use in State v. Lewis, Chaves County Cause Nos. 20294 & 22600, Consolidated.

1986 - 1990: Research historian and consultant for Legal Counsel, Division of Water Resources, Kansas State Board of Agriculture. Provided historical documentation and report on water rights and interstate apportionment of the Arkansas River between Kansas and Colorado for use in U.S. Supreme Court case, Kansas v. Colorado, October Term 1985, Original No. 105. Testified as an expert witness historian for twelve days.

1986 - 1989: Research historian and consultant for Legal Counsel, State Engineer Office, State of New Mexico. Provided historical documentation and report on water rights in the Carlsbad Irrigation District in southeastern New Mexico for use in State v. Lewis, Chaves County Cause Nos. 20294 & 22600, Consolidated.

1986 - 1987: Historical consultant for National Geographic Magazine. Advised editors on June 1987 article, "George Washington's Patowmack Canal."

1984 - 1986: Research historian and consultant for Legal Counsel, State Engineer Office, State of New Mexico. Provided historical documentation and report on the history of Rio Grande water rights and interstate apportionment disputes between New Mexico and Texas for use in El Paso v. Reynolds, U.S.D.C. Civ. No. 80-730-HB.

OTHER PROFESSIONAL EXPERIENCE:

January 1992 - 1994: Member of Board of Editors of Western Historical Quarterly.

1991 - 1995: Part-time lecturer, Department of History, California State University, Hayward. Taught survey courses on American history and California history.

1980 - 1984: Editorial Assistant, Pacific Historical Review. Edited scholarly articles and book reviews.

PUBLICATIONS:

Books:

The Spirit of Enterprise: A History of Pacific Enterprises, 1867-1989 (coauthor, 1990).

Articles:

"The Forensic Historian: Clio in Court," Western Historical Quarterly (1994).

"The Rio Grande Compact of 1929: A Truce in an Interstate River Apportionment War," Pacific Historical Review (1991).

"Eighteenth Century Plans to Clear the Potomac River: Technology, Expertise, and Labor in a Developing Nation," Virginia Magazine of History and Biography (1985).

"The Potomac Company: A Misadventure in Financing an Early American Internal Improvement Project," Business History Review (1984).

"Water Rights During the California Gold Rush: Conflicts over Economic Points of View," Western Historical Quarterly (1983).

"Maryland Sectionalism and the Development of the Potomac Route to the West, 1768-1826," Maryland Historian (1983).

Book Reviews:

David C. Frederick, Rugged Justice: The Ninth Circuit Court of Appeals and the American West, 1891-1941 (Berkeley: University of California Press, 1994), in Pacific Historical Review (forthcoming).

Daniel Tyler, The Last Water Hole in the West: The Colorado - Big Thompson Project and the Northern Colorado Water Conservancy District (Niwot, Colorado: University Press of Colorado, 1992), in Montana: The Magazine of Western History (1994).

Lloyd Burton, American Indian Water Rights and the Limits of Law (Lawrence: University Press of Kansas, 1991), in Journal of the West (1994).

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David J. Eaton and Michael Andersen, The State of the Rio Grande/Rio Bravo: A Study of Water Resource Issues Along the Texas/Mexico Border (Tucson: University of Arizona Press, 1987), in New Mexico Historical Review (1988).

Pat Kelley, River of Lost Dreams: Navigation on the Rio Grande (Lincoln: University of Nebraska Press, 1986), in Pacific Historical Review (1988).

Marc Reisner, Cadillac Desert: The American West and Its Disappearing Water (New York: Viking Penguin, Inc., 1986), in Environmental Review (1987).

Thomas F. Hahn, The Chesapeake and Ohio Canal: Pathway to the Nation's Capitol (Metuchen, N.J.: Scarecrow Press, Inc., 1984), in Business History Review (1987).

PROFESSIONAL AFFILIATIONS:

American Association for State and Local History, American Historical Association, California Committee for the Promotion of History, California Historical Society, California Map Society, National Council on Public History, Ninth Judicial Circuit Court Historical Society, Organization of American Historians, Western History Association, Western Council on Legal History.

APPENDIX F -- VITA OF JENNIFER HOLWEGER

Littlefield Research Associates
1523 Anza Street
San Francisco, CA 94118
(415) 752-3625

EDUCATION:

M.A. American History. University of California, Santa Barbara, 1995.

B.A. History and Political Science, University of California, Santa Barbara, with Honors, 1993.

AREAS OF CONCENTRATION IN GRADUATE STUDY:

American Environmental Policy, River Management, 20th Century America, Western Settlement, Agricultural Policy, Legal History from 1900-1940.

HISTORICAL CONSULTING EXPERIENCE:

1995-Present: Assistant research historian and consultant for the Salt River Project (Arizona). Determining the commercial navigability of the Salt River, Gila River, and Verde River at the time of statehood (1912) through historical documentation for use in hearings before the Arizona Navigable Stream Adjudication Commission.

1995-Present: Assistant research historian and consultant for Nebraska Department of Water Resources. Providing research on the history of Nebraska v. Wyoming, 325 U.S. 589 (1945), for use in present litigation between Nebraska and Wyoming over the apportionment of North Platte River waters.

TEACHING EXPERIENCE:

1994-1995: Teaching Assistant. Department of History, University of California, Santa Barbara. United States History, settlement-present. Incorporation of environmental history into mainstream history taught by professors.

OTHER RELATED WORK EXPERIENCE:

1995: Water Policy Researcher/Analyst. Environmental Policy Center, San Francisco. Responsible for researching local government policies dealing with water efficiency and water quality. Updated information on Center's Web site, followed trends in policy making and assisted local government clients in implementing policies suitable for their particular locality.

1992: Campaign Aide. Santa Barbara District Supervisor Bill Wallace. Responsible for schedulings, mailings, and public relations work with University students in successful 1992 campaign.

1990-1991: Reporter. UC Santa Barbara's Daily Nexus. Reported on the community's environmental issues. Specifically followed stories associated with Chevron's use of the Santa Barbara Channel.

1991: Political Journalist Intern. Cable News Network (CNN), Washington, D.C. Produced a weekly newsletter summarizing national news for producers. Responsible for following specific national campaigns and compiling updates.

CONFERENCES ATTENDED:

American Environmental Historians, "Gambling With Our Environment." March, 1995. Las Vegas.

SCHOLARLY WORKS:

In Name But Not in Practice: The Role of the Agrarian Myth in Western Water Development and State Building. Partial fulfillment for M.A. Degree.

Dam the Progressives: Multi-Purpose River Development, 1900-1914. Partial fulfillment for M.A. Degree.

BOOK REVIEWS:

William D. Rowley, Reclaiming the Arid West, The Career of Francis G. Newlands (Bloomington and Indianapolis: Indiana University Press, 1996), in Journal for the History of Technology (forthcoming).

INDEX

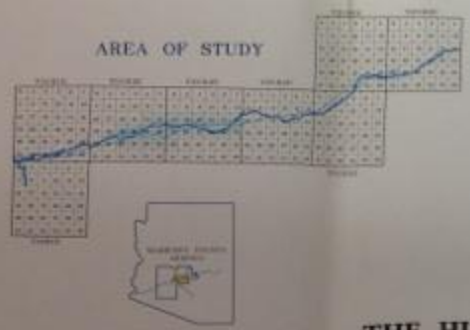

EXHIBIT 2
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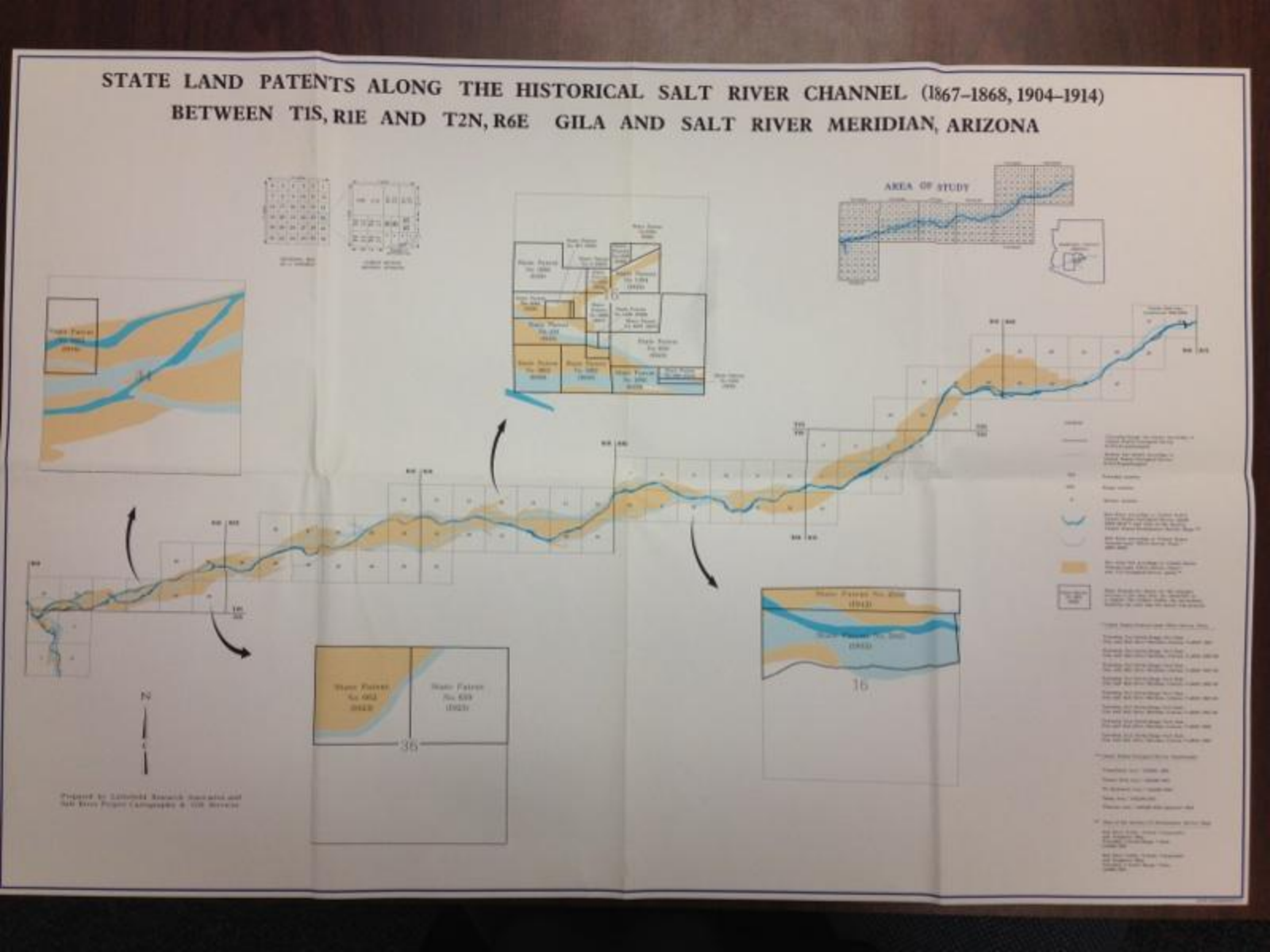
STATE LAND PATENTS ALONG THE HISTORICAL SALT RIVER CHANNEL (1867–1868, 1904–1914) BETWEEN T1S, R1E AND T2N, R6E GILA AND SALT RIVER MERIDIAN, ARIZONA



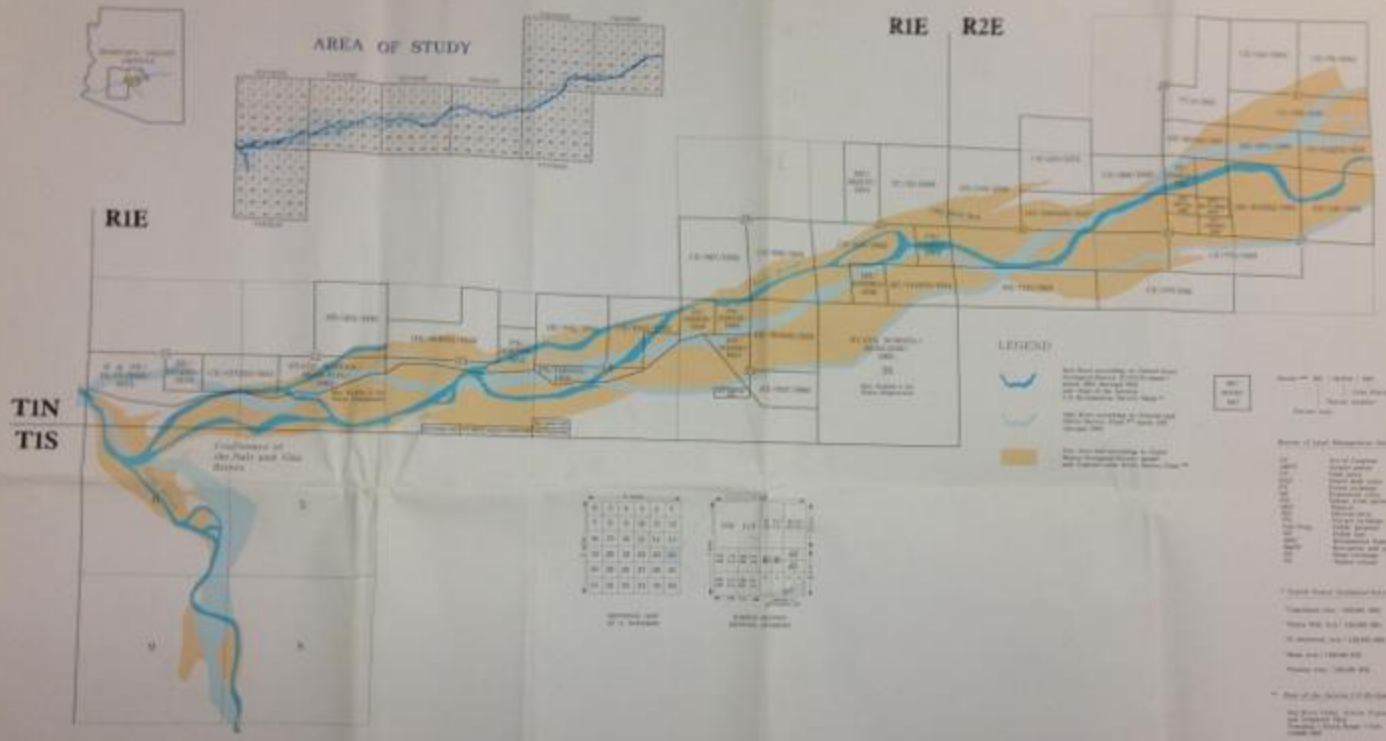


EXHIBIT 1
FEDERAL LAND PATENTS ALONG
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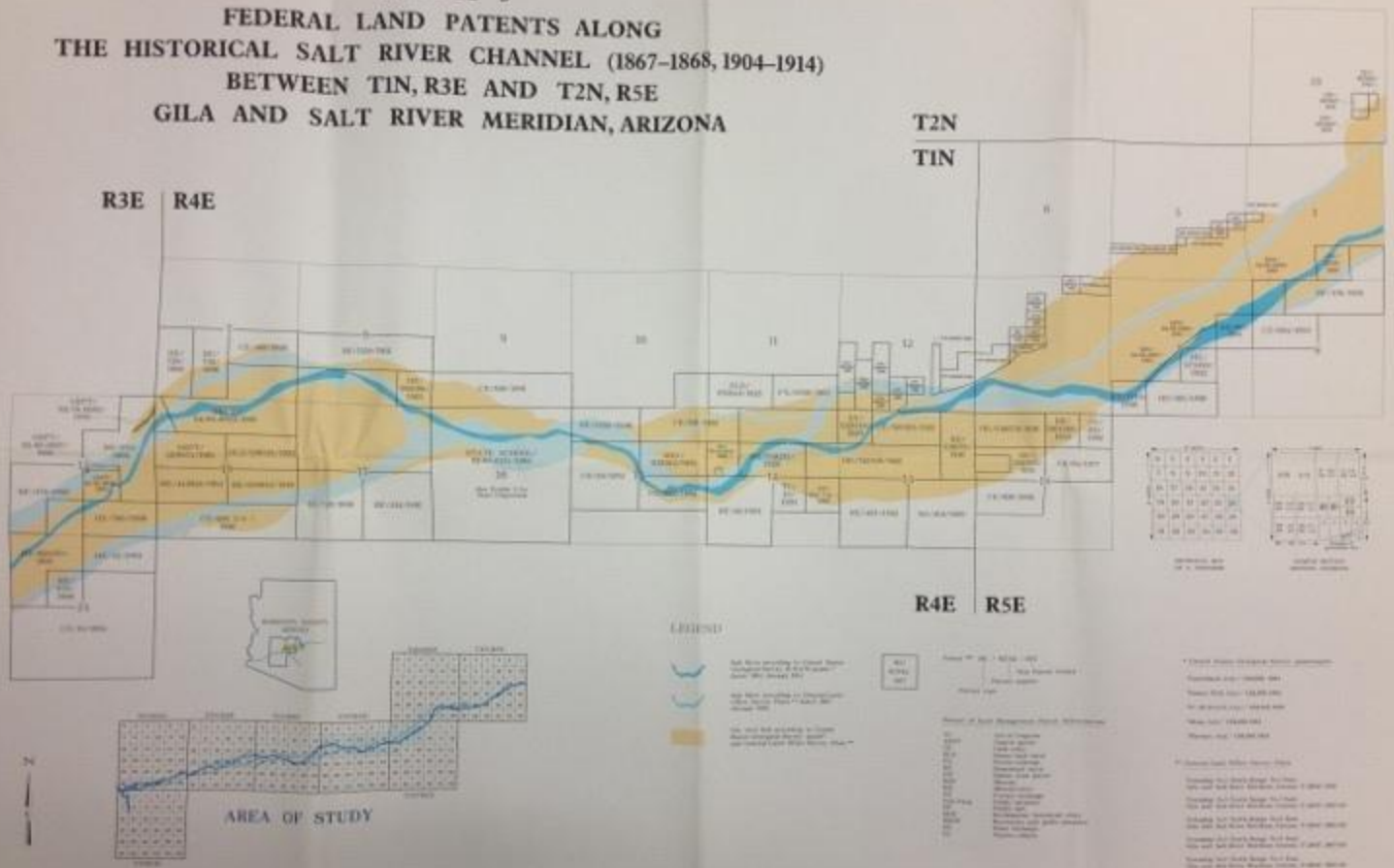
BETWEEN T1S, R1E AND T1N, R2E
GILA AND SALT RIVER MERIDIAN, ARIZONA

EXHIBIT 3
FEDERAL LAND PATENTS ALONG THE HISTORICAL SALT RIVER CHANNEL (1867–1868, 1904–1914) BETWEEN T1N, R3E AND T2N, R5E GILA AND SALT RIVER MERIDIAN, ARIZONA



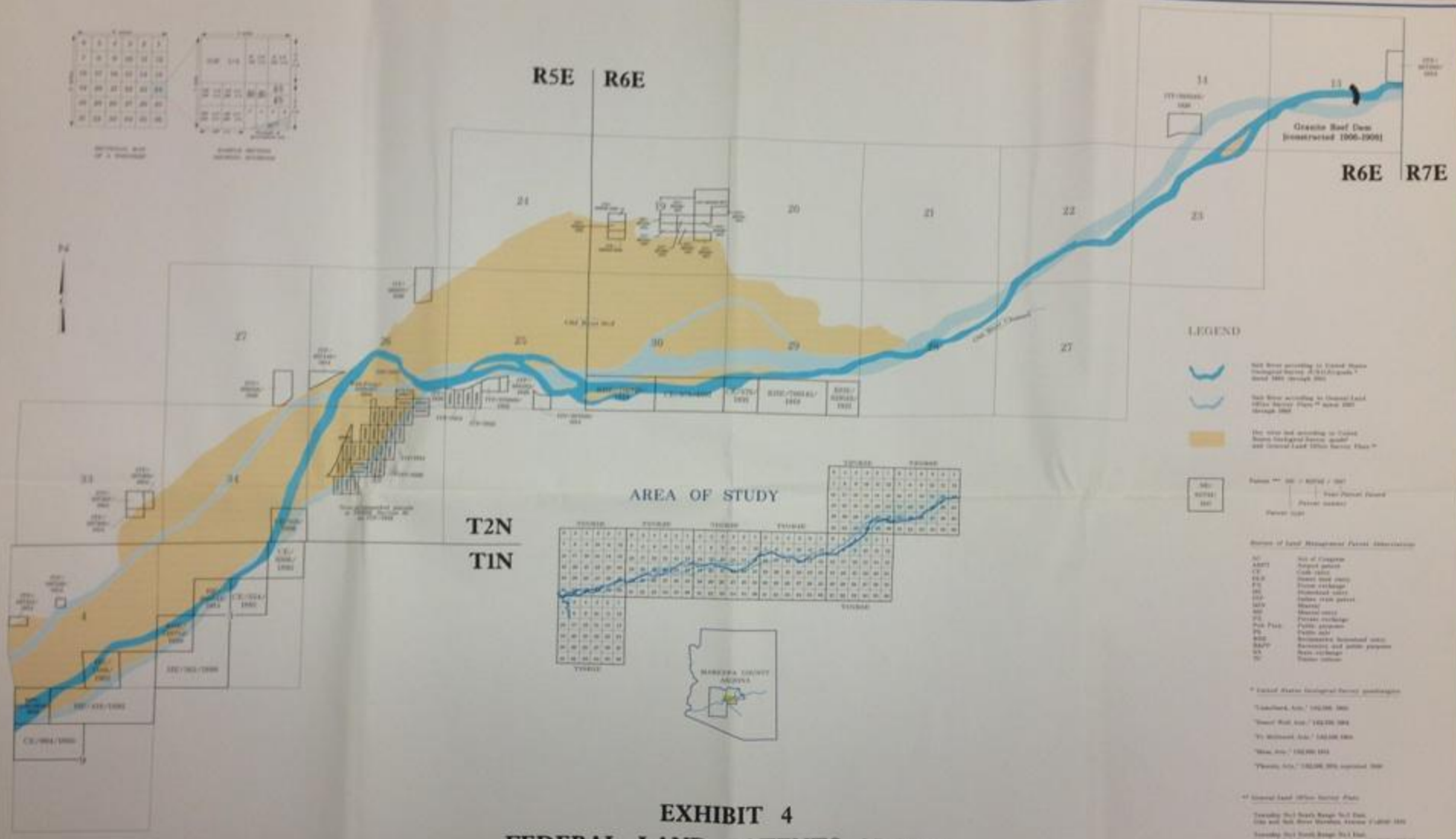


EXHIBIT 4
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Prepared by Littlefield Research Association and Salt River Project Cartographer & GIS Services