ASSESSMENT OF THE NAVIGABILITY OF THE GILA RIVER BETWEEN THE MOUTH OF THE SALT RIVER AND THE CONFLUENCE WITH THE COLORADO RIVER PRIOR TO AND ON THE DATE OF ARIZONA'S STATEHOOD, FEBRUARY 14, 1912

by

Douglas R. Littlefield, Ph.D.
Littlefield Historical Research
6207 Snake Road
Oakland, California 94611
510-339-1017

November 3, 2005

TABLE OF CONTENTS

MAPS, PHOTOS, AND ILLUSTRATIONS

EXECUTIVE SUMMARY

This report is a revised version of "Assessment of the Navigability of the Gila River from Its Confluence with the Salt River to Its Mouth on the Colorado River Prior to and on the Date of Arizona's Statehood, February 14, 1912," by Douglas R. Littlefield. The earlier report was dated April 24, 1998, and previously was submitted to the Arizona Navigable Stream Adjudication Commission. The purpose of this new report is to assess in greater detail the possible navigability (or lack thereof) of the Gila River between its confluence with the Salt River to its juncture with the Colorado on or before February 14, 1912 – the date Arizona became a state.

To make the evaluation of the Gila River's navigability in 1912, a wide array of published and unpublished documents and photographs were consulted (discussed in greater detail in the "Introduction" and listed in the footnotes and appendices). This survey of hundreds of primary and secondary sources yielded a wide spectrum of historical views of the Gila River, from U.S. Government surveys and reports, land settlement records created by the U.S. and Arizona authorities, explorers' journals, diaries, early pioneer reminiscences, historical photographs, newspaper accounts, and many other types of records.

Taken as a whole, these records illustrate that prior to and at the time of Arizona's statehood the Gila River was considered to be not navigable by virtually every contemporaneous observer. It is significant that cumulatively, hundreds of people made judgments concerning the Gila River's navigability – opinions spread over many years, different seasons, and over a large geographic area. The historical record demonstrates that the Gila River was erratic, subject to flooding and channel changes, blocked by obstacles (both natural and manmade), and diverted for irrigation needs. In short, the Gila River was not navigable on February 14, 1912.

INTRODUCTION

The determination of the ownership of the bed of a river or lake anywhere in the United States is related to the characteristics of that body of water at the time the region became a state. The historical basis for this legal doctrine stems from the original thirteen American colonies' relationship with the Crown of England. Over centuries, English common law had evolved to establish that the King owned the beds of navigable waterways in order to protect their accessibility for his subjects. This royal power had developed to prevent parties from building structures such as wharfs, docks, or mill dams that might interfere with boat traffic in rivers or streams. The beds of non-navigable waterways where transportation was not an issue, in turn, remained vested in adjacent landowners. This legal principle was well established long before the American Revolution, and it therefore applied to the English colonies in the new world as well as to lands within England. Following the end of the Revolution in 1783, the rights and duties of the Crown passed to the newly independent states by virtue of their sovereignty. This made the original thirteen American states the owners of the beds of navigable streams and lakes within their borders. Because new states enter the Union on the same basis as the original thirteen – a legal principle known as the "equal footing" doctrine – those new states become the owners of the beds of waterways within their borders that were navigable at the time of their statehood.

In Arizona's case, this "equal footing" tenet means that Arizona has a claim to sovereign property under any streams or lakes within the State that were navigable on February 14, 1912 – the date Arizona joined the Union.[1] If the watercourse was not navigable in 1912, ownership of

---

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

the bed remained in the United States Government's hands until lands adjacent to and under 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 body of water.

A. PURPOSE OF THIS REPORT, GEOGRAPHICAL LIMITS, AND PERIOD CONSIDERED

The purpose of this report is to examine the nature of the Gila River 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 navigable or susceptible of navigation. The time period covered by this report extends from the pre-statehood era to the years shortly after Arizona joined the Union. The geographic range is from the Gila River's confluence with the Salt River downstream to where the Gila flows into the Colorado River.

B. RESEARCH AND WRITING METHODOLOGY

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 Gila River. To locate all relevant sources, a preliminary list of terms and individuals' names initially was developed for searching many local, state, and national archives. The list was supplemented as research brought to light new topics and parties related to the Gila River. Since individual archives have different means of listing their holdings, the list was adapted to accommodate specific locations.

1. Arizona State University

Initial research was conducted at Arizona State University. The University's main library houses the Archives and Manuscript Division in the Luhrs Reading Room (which focuses on Arizona and Southwest history) in addition to the privately funded Arizona Historical

Foundation. Both archives contain excellent collections of source materials (published as well as unpublished) and extensive collections of books focusing on the history of Arizona. At Arizona State University, the computer on-line manuscript database, which contains file titles from each manuscript collection at the library, was searched. Printed finding aids also were reviewed. The preliminary searches yielded eleven unpublished manuscript collections of prominent citizens and early settlers in the Gila Basin including Phillip A. Bailey, Lloyd C. Henning, and Carl Hayden. The manuscripts in these collections provided eyewitness accounts of the Gila (such as descriptions of floods, the river's channel, and local activities taking place on or near the stream). The manuscript collections also yielded useful insights on the development of irrigation systems along the Gila, including reservoirs, diversion dams, and canals.

Arizona State University held a complete set of Arizona statutes. The laws were searched for legislation relevant to navigability and public land disposal.

2. Historical Arizona Newspapers

Additionally, historical Arizona newspapers were searched to obtain a sense of the activities occurring on the Gila River and for firsthand accounts of any important events. Many newspapers around the turn of the century provided booster-like stories intended to attract settlers to local communities. Such reports frequently noted transportation, mild weather, and other conveniences. Travel on the Gila River, therefore, certainly would have been celebrated in the area press had it occurred regularly and reliably. Newspapers searched include the *Arizona Weekly Gazette* (Phoenix, 1909-1914), the *Yuma Examiner* (1909-1913), and the *Arizona Sentinel* (Yuma, 1909-1915).

3. University of California, Berkeley

Also useful was the Water Resources Center Archives at the University of California, Berkeley. Although located in California, this library is one of the premier depositories for 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. The Water Resources Center Archives also holds many published U.S. 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 Gila River Valley) as well as the U.S. Reclamation Service *Annual Reports*.

The University of California, Berkeley, was also the site of research on boating around the time of Arizona's statehood. Published reports of the Commissioner of Corporations on Transportation by Water were reviewed to determine the extent of technology development for shallow watercraft by 1912. Also examined were records about boating on the Colorado River. This stream was a catalyst for advances in boating technology because of its swift current, shallow water, and frequently changing channel. Information on watercraft on the Colorado is useful to understand river boating throughout the West – including on the Gila – around the turn of the century.

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 of unpublished documents at the Bancroft relating to the Gila 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 Gila River.

4. U.S. Government Reports

Following research at the Bancroft Library and the Water Resources Center Archives, additional 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 Gila River Valley. These documents provided descriptions of the Gila at different points in time leading up to and shortly after Arizona's statehood. Some of the reports are specific to the Gila River, but much of the information found was contained in larger studies on Arizona and the West. In addition, a computer search was done of files compiled by the Congressional Information Services (CIS) to find Congressional documents, hearings, and reports relevant to the Gila River.

5. U.S. Bureau of Land Management (Phoenix)

In addition to the sources obtained at Arizona State University and the University of California, 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 Gila River around the time of statehood. The Bureau of Land Management holds the records of the original U.S. General Land Office surveys. These surveys were done to prepare the public domain for homesteading, and the survey records include original surveyors' plats and field notes. Since surveyors were required to "meander" all navigable bodies of water (record the banks' bends and turns by degree bearings) and to keep detailed notes of these meanders, survey documents are vital to understand the nature of the river at the time of survey.

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 U.S. Government disposed of the public lands in Arizona through which the Gila River flowed. From this material, any U.S. patent that either overlaid or bordered the Gila River was obtained to see if any distinction was made regarding the stream's bed and banks. Federal patents were critical in determining how the United States viewed the public lands in Arizona, including those containing watercourses. Eventually, a large number of U.S. patents were reviewed for this report. The U.S. National Archives in Washington, D.C., provided supporting paperwork for federal land patents such as applications and affidavits of witnesses. Federal patents and their files, combined with historical maps, were used to create Exhibits 2-5, which illustrate the location of all patents and federal land grants along the Gila River. Exhibits 2-5 are reproduced in Chapter II of this report.

6. Arizona Historical Society and other Phoenix-Area Archives and Agencies

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 additional rare State and Territorial government documents and manuscript collections. These materials include 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 Gila River granted to it by the U.S. 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 Gila 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 United States Government. Approximately fifty State patents were eventually reviewed. Exhibit 1A in Chapter II of this report illustrates the location of some of these State patents. The corresponding application files for the State patents were also obtained and reviewed where possible.

7. Salt River Project and U.S. National Archives (Washington, D.C.)

The Salt River Project Archives in Tempe was also a critical location for research. The material found at the Salt River Project Archives was 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 were searched, including those of 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. These records contain unpublished paperwork substantiating the conclusions gleaned from published Government documents.

8. U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

Further research was also undertaken at the Rocky Mountain Branch of the U.S. National Archives in Denver, Colorado. At this branch of the National Archives, the records of the U.S. Bureau of Reclamation were examined. These records are organized into two chronological periods, with the 1902-1919 group containing material most relevant to this study. These records provided a rich source of information from an agency directly involved in studying the Gila River around the time of statehood.

C. ORGANIZATION OF REMAINDER OF REPORT

Based on this extensive research, it became evident that the most important records dealing with the Gila River were U.S. General Land Office original surveys and patent records (both U.S. and State). Therefore, the next two sections of this report, Chapters I and II, deal with the significance of those documents. Other Government documents (both published and unpublished) will be discussed in Chapter III. Chapter IV is a review of miscellaneous documents (such as diaries, journals, and accounts of explorations) as well as press accounts and historical photographs. Chapter V contains a discussion of boats typically used on western rivers around the turn of the twentieth century. Following a general summary and conclusions, there are appendices containing sources consulted as well as the resume of Douglas R. Littlefield.

To facilitate reference throughout the main body of the report, footnotes run continuously rather than starting from number one in each chapter. In addition, footnotes have been repeated in their entirety where necessary for ease of reference.

CHAPTER I: U.S. GOVERNMENT HISTORICAL RECORDS – FEDERAL SURVEYS

One of the largest and most important groups of records created in relation to the Gila 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, U.S. officials were anxious to determine the value of the country's new lands. Moreover, they wanted to prepare the region for orderly occupation by American settlers to solidify control. To ready the new areas for homesteading and to record those lands' characteristics, the U.S. Government undertook formal surveys conducted by the General Land Office – the predecessor of today's U.S. Bureau of Land Management. Because those surveys were highly detailed, the original plats of the area near the Gila River and the related survey field notes contain a wealth of information about the nature of that stream.

A. 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 to direct surveyors in their work. To grasp the significance of these manuals in relation to navigability, it is important to understand the books' provisions and how they changed over time.

1. The 1851 *Manual*

The 1851 *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 was 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 *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 town at its center. Jefferson's ideas were first enacted into law in the *Land Ordinance of 1785*.[3] The first surveys under this legislation were done in 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.

---

[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).

[3] For details on the *Land Ordinance of 1785*, see Paul W. Gates, *History of Public Land Law Development* (Washington, D.C.: Zenger Publishing Co., Inc., 1968), pp. 59-74. Gates's seminal study of the history of public lands was undertaken by direction of Congress (78 Stat. 982), which in 1964 created the Public Land Law Review Commission. See ibid., pp. ii-iii, 807-814.

To establish township and range lines, a base line and meridian were chosen 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 the Salt and Gila rivers. That location had been chosen in 1865 by John A. Clark, Surveyor General of New Mexico Territory, to begin the Arizona surveys. The beginning marker originally had been established by the Mexican Boundary Commission in 1851 as 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.[4]

Using the Gila and Salt River Base and Meridian to start, federal surveyors ran township and range lines in Arizona by working their way gradually north and south to create township lines and east and west to establish ranges. The 36 blocks consisting of one-square-mile each were called townships (as distinct from township lines). Surveyors numbered the townships on the basis of how far north or south and east or west of the initial base and meridian they lay. 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 Gila River from its confluence with the Salt River downstream to its juncture with the Colorado River near Yuma, Arizona – the lands examined lie between township 1 north, range 1 west, and township 8 south, range 23 west.

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

---

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

acres, or one mile square. Due to the curvature of the earth and other factors, surveyors sometimes had to adjust slightly the sections along the western and northern edges of each township 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 section numbering then went east through section twelve. The remaining sections were numbered in the same "S" fashion until section thirty-six was reached in the extreme southeastern 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, irrigation ditches, or other prominent landmarks. Using their field notes, surveyors then were 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 and therefore are important in relation to any consideration of the Gila River's navigability or non-navigability. 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.[5]

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."[6] (Congress first passed legislation establishing that navigable waterways remain public highways in 1796 – a statute that led to the requirement that navigable rivers and lakes be meandered by federal surveyors – but that law did not specify what constituted navigability.)[7] Therefore, where township, range, section, or fractional section lines encountered bodies of water, witness posts were to be established if those watercourses 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:

---

[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. 438.

[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. 439. On the federal legislation mandating meanders of navigable bodies of water, see White, *A History of the Rectangular Survey System*, p. 30.

[7] *An Act Providing for the Sale of the Lands of the United States in the Territory Northwest of the River Ohio, and above the Mouth of Kentucky River*, 1 Stat. 464 (1796). The 1796 legislation is now codified at 43 U.S.C. §931.

> [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 rivers, lakes, or other bodies of water were to be done as follows:

> In cases of *navigable streams*, their width will be ascertained between *meander corners*, as set forth under the proper heading. [Emphases in original.][8]

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.[9]

Finally, as if these instructions were not specific enough, the 1851 *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.[10]

2. 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 Surveying Districts*

---

[8] *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.

[9] *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.

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

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.[11]

3. 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. 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*. Because surveys in Arizona began in 1868, it was this set of instructions that governed how bodies of water in the Territory were recorded.

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:

> Rivers not embraced in the class denominated "navigable" under the statute, 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 side (looking downstream) unless obstacles made it necessary to switch to the left bank.

---

[11] 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.

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.[12]

4. 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, 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, the 1881 *Instructions* told surveyors to use triangulation to establish the distance across 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, 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.[13]

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 directions provided that "[m]eander corners are established at all those points where the lines of the public

---

[12] *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.

[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), p. 516.

surveys intersect the banks of such rivers, bayous, lakes, or islands as are by law directed to be meandered."[14]

In terms of how meanders were to be carried out, the 1881 directions repeated the information from the 1855 *Manual* as well as the 1864 addition that rivers that were not navigable "under the 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.[15]

5. 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 also still were instructed to set a witness post on line at the edge of the non-navigable 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 1855, 1864, and 1881, the 1890 directions

---

[14] *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.

[15] *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.

also stated that for navigable bodies of water, meander posts were to be set where lines intersected these obstacles, and meanders were to be run following the course of the river.[16]

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 directions 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.][17]

In short, there had been two significant changes regarding what bodies of water should be meandered. The first was that meanders were to be done of waterways "as are by law directed to be meandered" (1881) or "embraced in the class denominated as 'navigable'" (1890). The second change as to what was to be meandered affected non-navigable streams. This change involved bodies of water used for "internal communication" (1881), where one bank was to be meandered, or streams more than three chains wide (1890), where both banks were to be meandered.

---

[16] *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.

[17] *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.

6. 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* had major changes in relation to which 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 another 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.)[18]

7. 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* and its 1894 predecessor regarding meandering. First, the 1902 *Manual* observed that the term "meander" had frequently been misapplied in the past by

---

[18] *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.

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.][19]

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.[20]

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

---

[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. 717.

[20] *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.

more or less than three chains wide, which should be meandered at ordinary high-water mark, as far as tide-water extends."[21]

B. 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.

C. U.S. GOVERNMENT SURVEYS IN THE GILA RIVER AREA

Prior to Arizona's statehood in 1912, various areas along the Gila River were surveyed and in some cases resurveyed, 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 generally did not have the responsibility to undertake meanders where necessary (unless their contracts covered both interior and exterior surveys, which was true in many cases), the field notes of the exterior surveys are of limited value to this report. Therefore, exterior surveys will not be discussed here. Instead, the field notes of interior surveys and resulting plats will be examined in detail for information regarding those surveyors' judgments and descriptions regarding the Gila River's navigability or non-navigability.

---

[21] *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.

The interiors of the townships through which the Gila River flows between the confluence with the Salt River and the juncture with the Colorado River were surveyed initially over a wide range of years, most of which were prior to statehood. Those surveys took place in 1868, 1871, 1874, 1877, 1878, 1882, 1883, 1890, 1910, and 1911. A resurvey of a part of one township was also undertaken in 1907. In addition, several townships were not surveyed until after Arizona's statehood on February 14, 1912. Those surveys took place in late 1912, 1915, and 1936. Because of the large number of different survey dates, cumulatively they were done according to the instructions of many of the survey manuals discussed above. Significantly, while there were nine U.S. Government surveyors who mapped the Gila between the Salt and Colorado rivers prior to 1912 and while those surveys were done under the instructions of many different survey manuals, all surveyors indicated in their field notes and plats that they did not consider the Gila River to be navigable.

Because of the importance of these initial federal surveys in relation to establishing the nature of the Gila River, they will be discussed in detail here. In general, the discussion will be in a down-river manner. In addition, while the field notes and plats for all townships along the Gila below the Salt River have been reviewed, most of the examples discussed in this report will be drawn from field notes and plats for areas covered by the detailed sample maps created for this report. Due to the length of the Gila River involved in this study, representative sampling was necessary to keep the discussion in manageable proportions. The location of the sample areas can be seen on the map in Exhibit 1, which is reproduced below. Exhibit 1 covers the Gila River from the mouth of the Salt River downstream to the Gila's confluence with the Colorado River, and the map shows in yellow the areas covered by this study in greater detail.

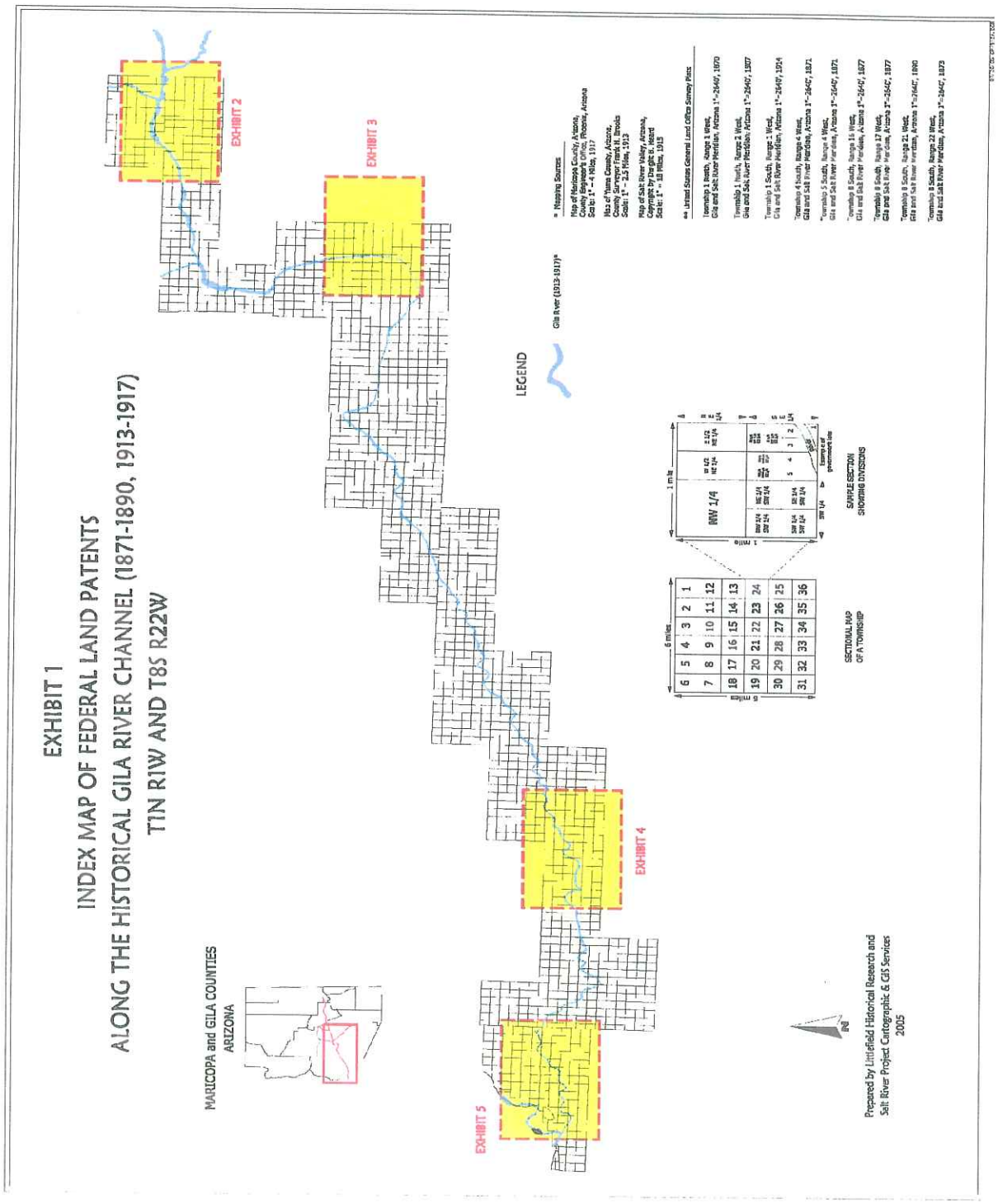


Exhibit 1, Index Map of Federal Land Patents along the Historical Gila River Channel (1871-1890, 1913-1917), T1N, R1W and T8S, R22W, Littlefield Historical Research and Salt River Project Cartographics, 2005

Exhibit 2 covers the area near where the Salt River meets the Gila. Exhibit 3 shows lands around Gila Bend on the Gila River. Exhibit 4 shows lands along the Gila River in the Mohawk Valley, and Exhibit 5 details the area at the juncture of the Gila and Colorado rivers near present-day Yuma, Arizona. Exhibits 2-5 are reproduced below.

Generally speaking, the sample areas in Exhibits 2-5 were chosen for this report because they had a relatively high density of original homestead patents – a factor that is important in relation to the discussion in Chapter II. With regard to the topic of this Chapter, although the study areas involve sampling along the river, nothing in the field notes and plats for townships outside the sample areas contradicts findings from plats and notes within the sample areas.

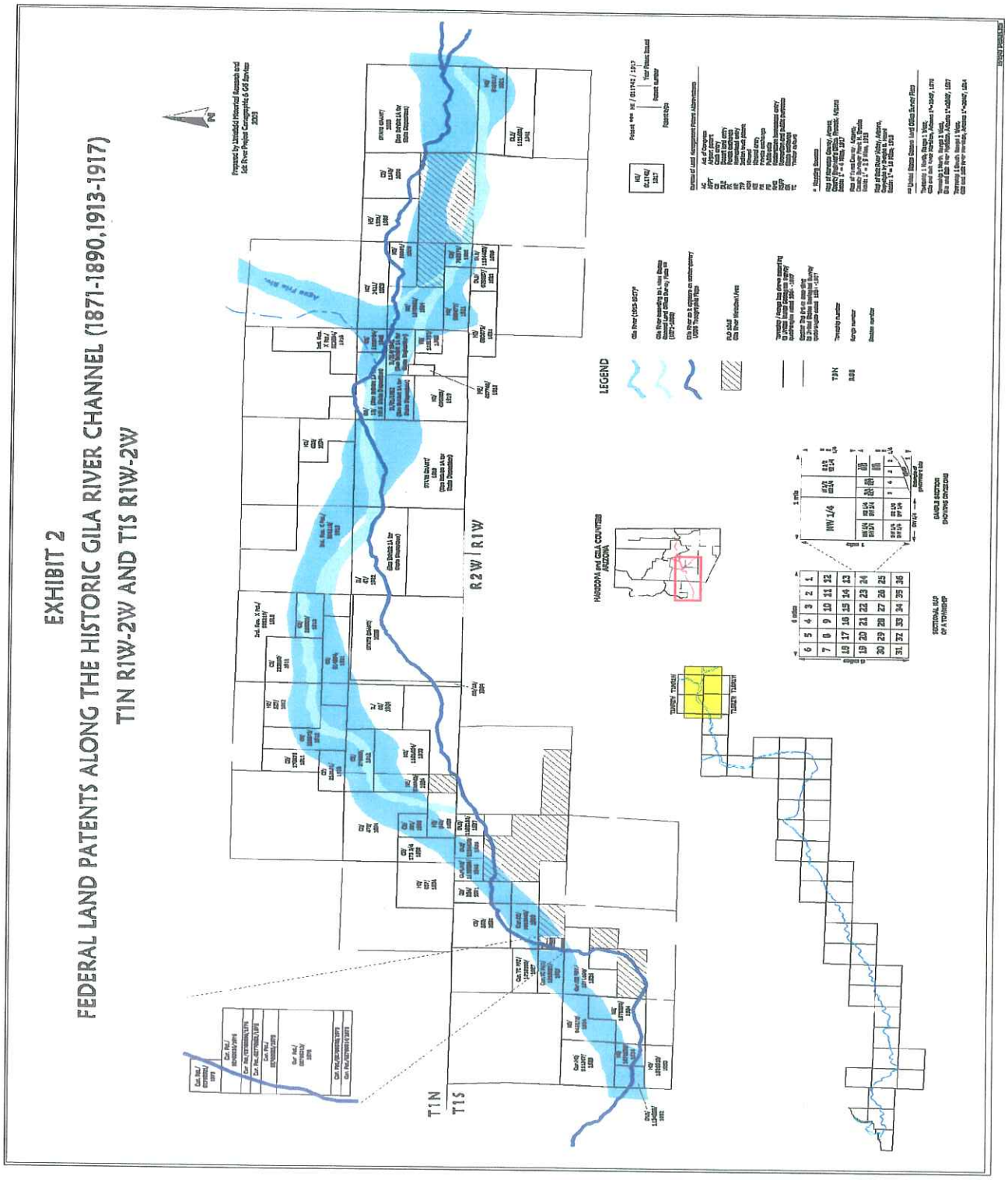


Exhibit 2, Map of Federal Land Patents along the Historic Gila River Channel (1871-1890, 1913-1917), T1N R1-2W and T1S R1-2W, Littlefield Historical Research and Salt River Project Cartographics, 2005

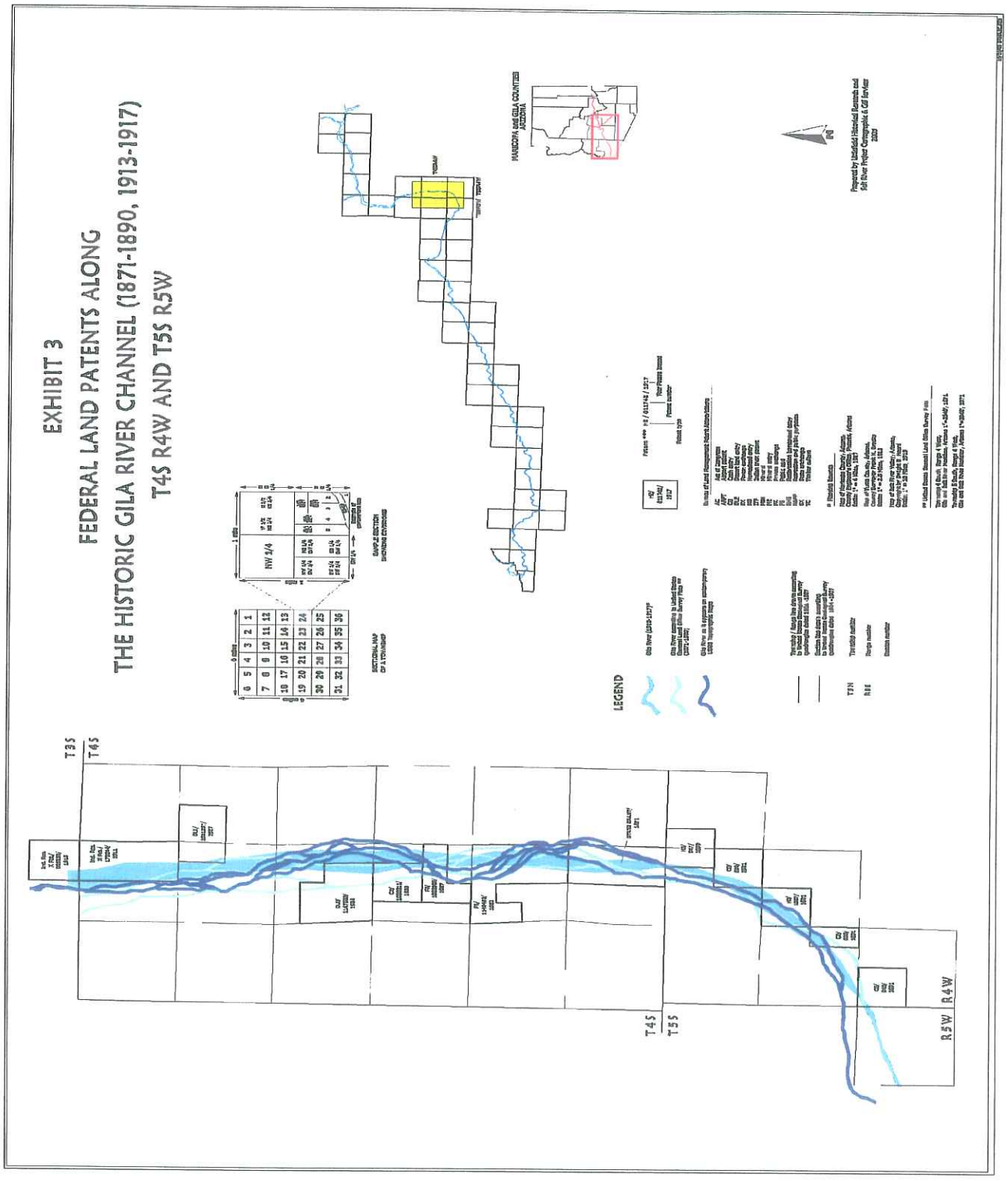


Exhibit 3, Map of Federal Land Patents along the Historic Gila River Channel (1871-1890, 1913-1917), T4S R4W and T5S R5W, Littlefield Historical Research and Salt River Project Cartographics, 2005

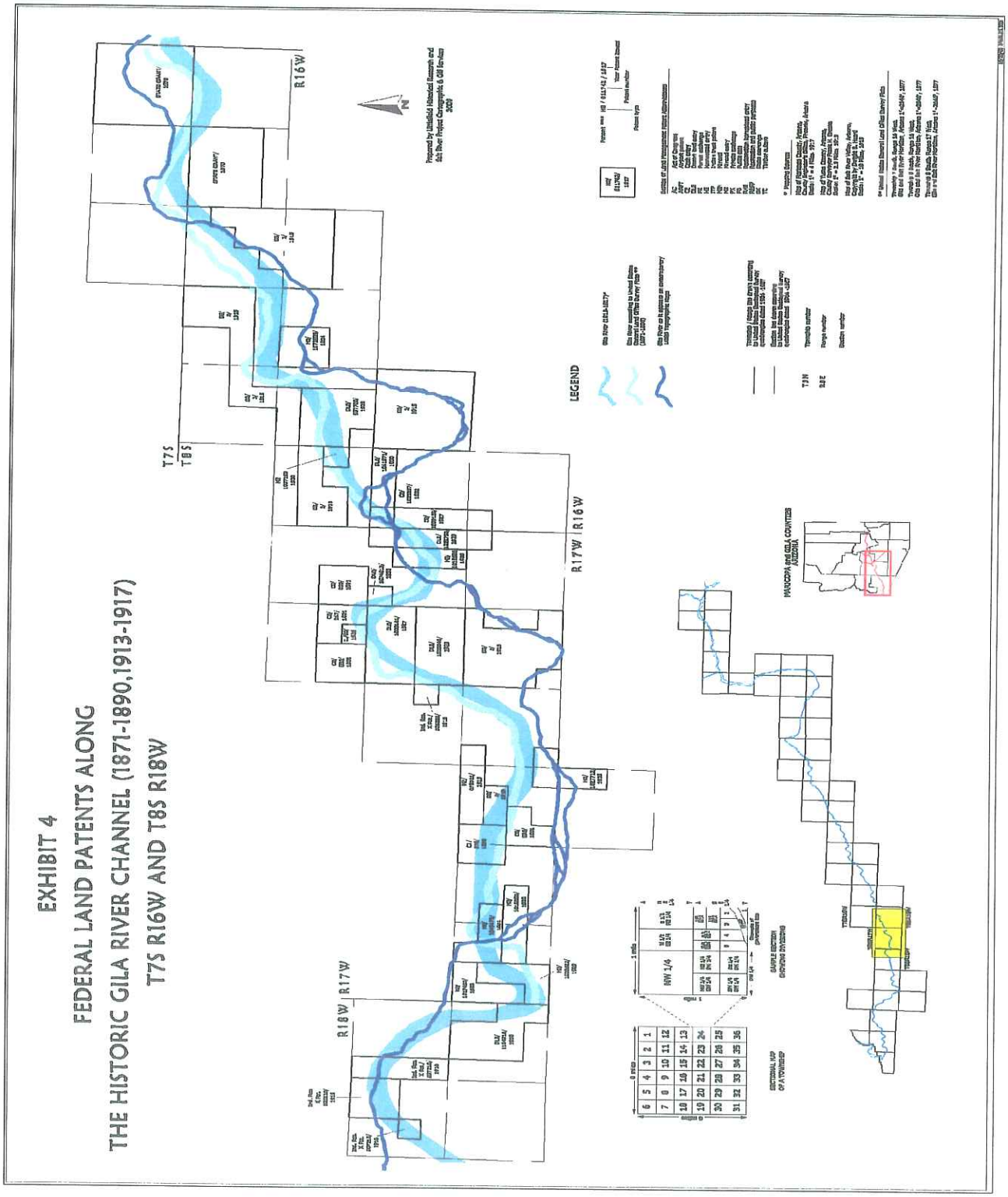


Exhibit 4, Map of Federal Land Patents along the Historic Gila River Channel (1871-1890, 1913-1917), T7S R16W and T8S R18W, Littlefield Historical Research and Salt River Project Cartographics, 2005

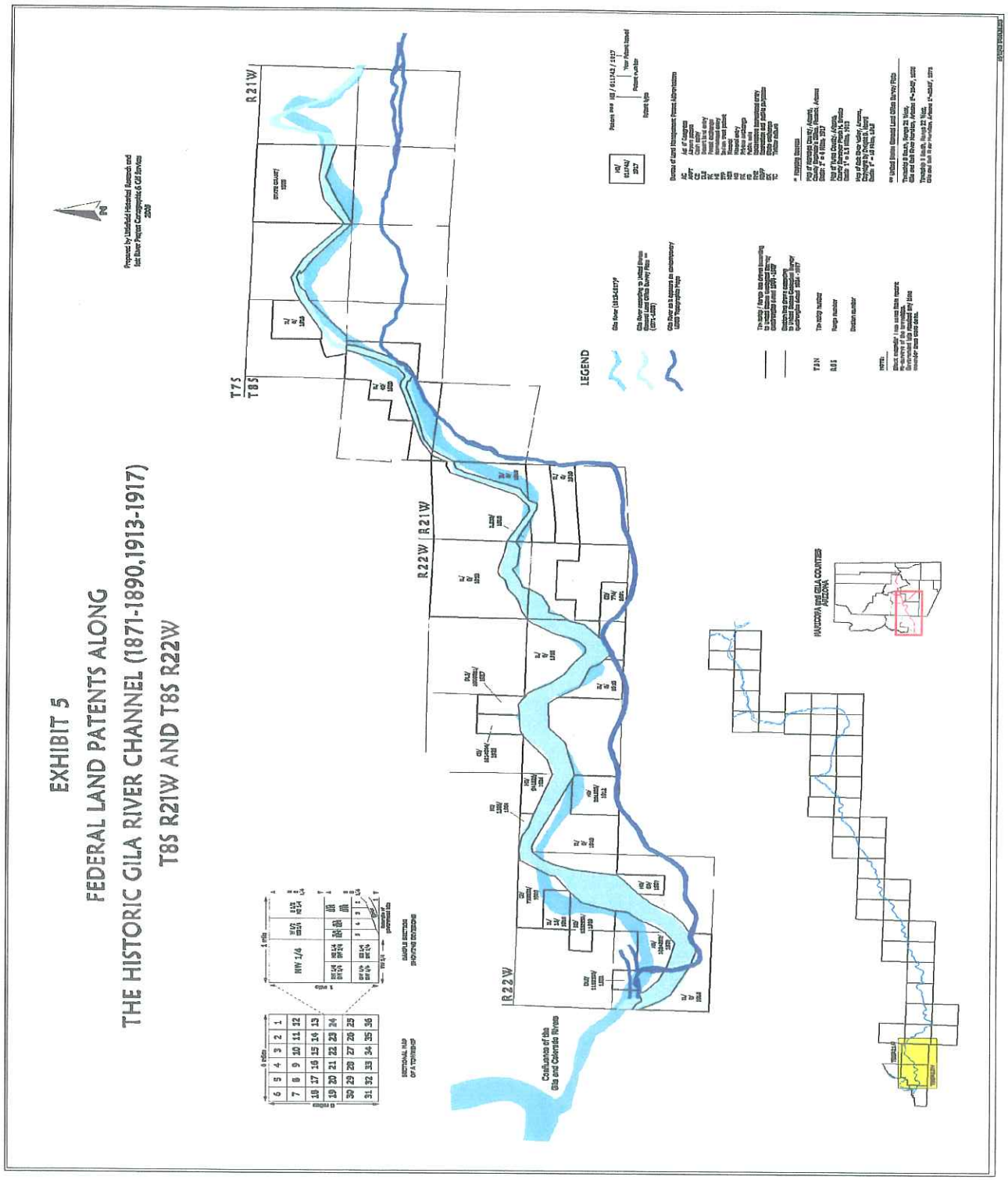


Exhibit 5, Map of Federal Land Patents along the Historic Gila River Channel (1871-1890, 1913-1917), T7S R21W and T8S R22W, Littlefield Historical Research and Salt River Project Cartographics, 2005

D. U.S. GOVERNMENT SURVEYS ALONG THE GILA RIVER (EXHIBIT 2)

Exhibit 2, the first sample area for discussion in this report with regard to U.S. Government surveys, covers parts of township 1 north, township 1 south, and ranges 1 and 2 west.

1. 1868 Interior Survey of Township 1 North, Range 1 West (Field Notes)

On June 22, 1868, G.P. Ingalls surveyed the interior subdivision lines of township 1 north, range 1 west. His field notes indicate that he encountered the Gila River on lines between sections 30 and 31, 31 and 32, 32 and 33, 33 and 34, and 34 and 35. (The places where Ingalls crossed the Gila along these lines can be seen on the plat, which is reproduced below.) As he crossed the Gila at each of these locations, he set no meander corners (as he would have been required to do under the 1864 surveying instructions had he considered the stream to be navigable). In addition to mentioning that the Gila had a rapid current and sandy bottom, he noted that "[i]t is a fine stream."[22]

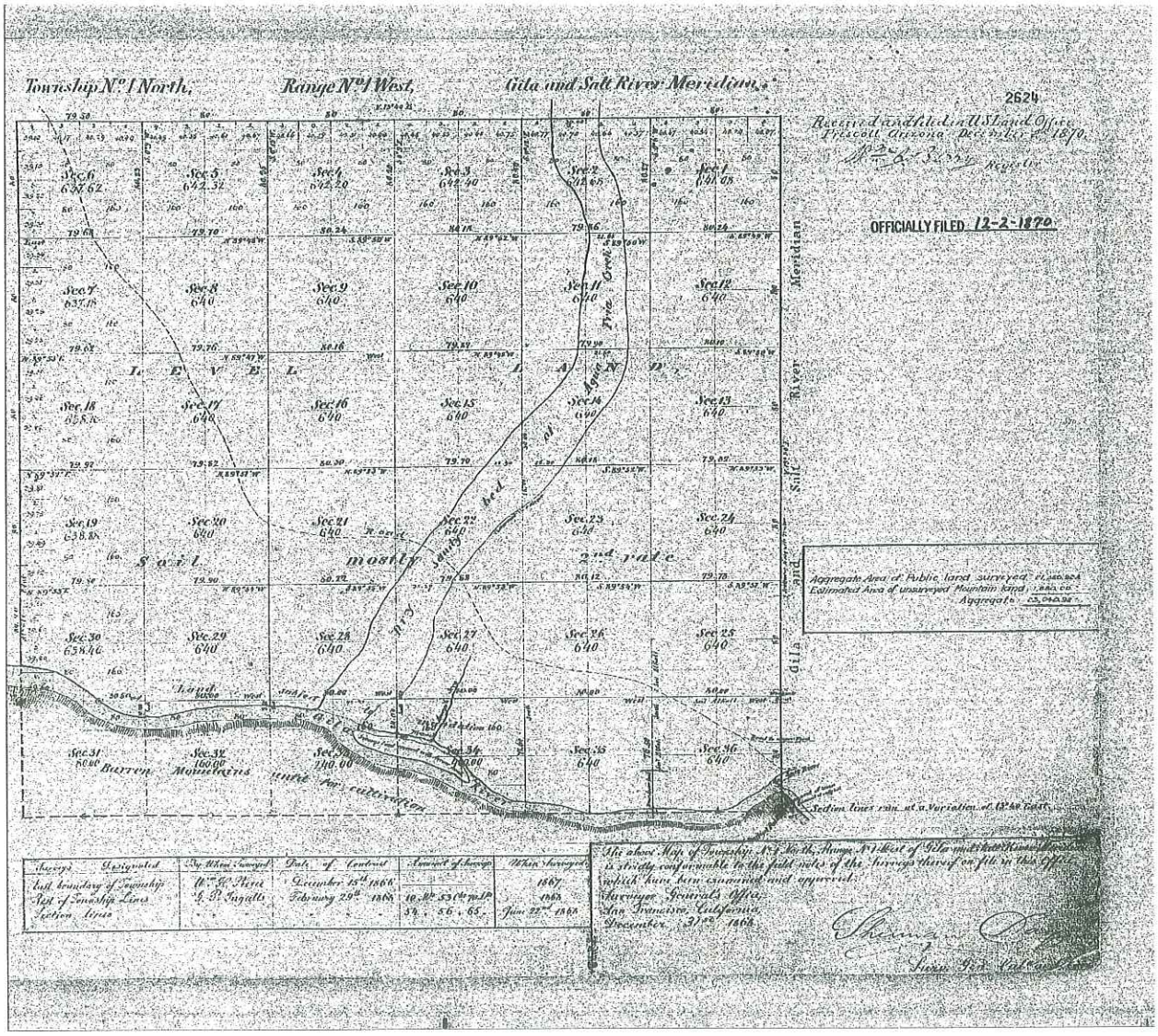
2. 1868 Interior Survey of Township 1 North, Range 1 West (Plat)

Ingalls's plat of township 1 north, range 1 west (approved by the Surveyor General on December 31, 1868 – see below), further confirms that he did not consider the Gila to be navigable. There are no meander lines on the plat, and in the box at the bottom of the plat identifying which surveyor had conducted various parts of the survey, there is no indication that

---

[22] "Field Notes of the Survey of Township 1 North, Range 1 West, Gila and Salt River Meridian," 1868, vol. R1, pp. 375-376, 387, 398, 408-409, 423, U.S. Bureau of Land Management, Phoenix, Arizona.

anyone had undertaken meander surveys. Moreover, there is no survey data recorded in the margin of the plat, as there would have been had meanders been done.[23]



Survey Plat of Township 1 North, Range 1 West, 1868, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

[23] Survey Plat of Township 1 North, Range 1 West, 1868, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona.

3. 1883 Interior Survey of Township 1 North, Range 2 West (Field Notes)

When R.C. Powers surveyed the interior subdivision lines of township 1 north, range 2 west in 1883, he gave no indication in the field notes that he considered the Gila River to be navigable. The Gila ran through the southeast corner of this township. When Powers crossed the river on the line between sections 25 and 26, he set no meander corners, but he indicated that the stream was characterized by "shallow water & rapid current." He made a similar observation about the river on the line between sections 34 and 35, but again set no meander corners. Finally, on the line between sections 26 and 35, he set no meander corners, but offered the description that the stream there had "deep water and low banks." In his general description of the township, Powers wrote: "This township is mostly good land and if the waters of the Gila River would be conducted in a ditch to the land for irrigation (which could be done with some expense) the land could be made very valuable and productive."[24]

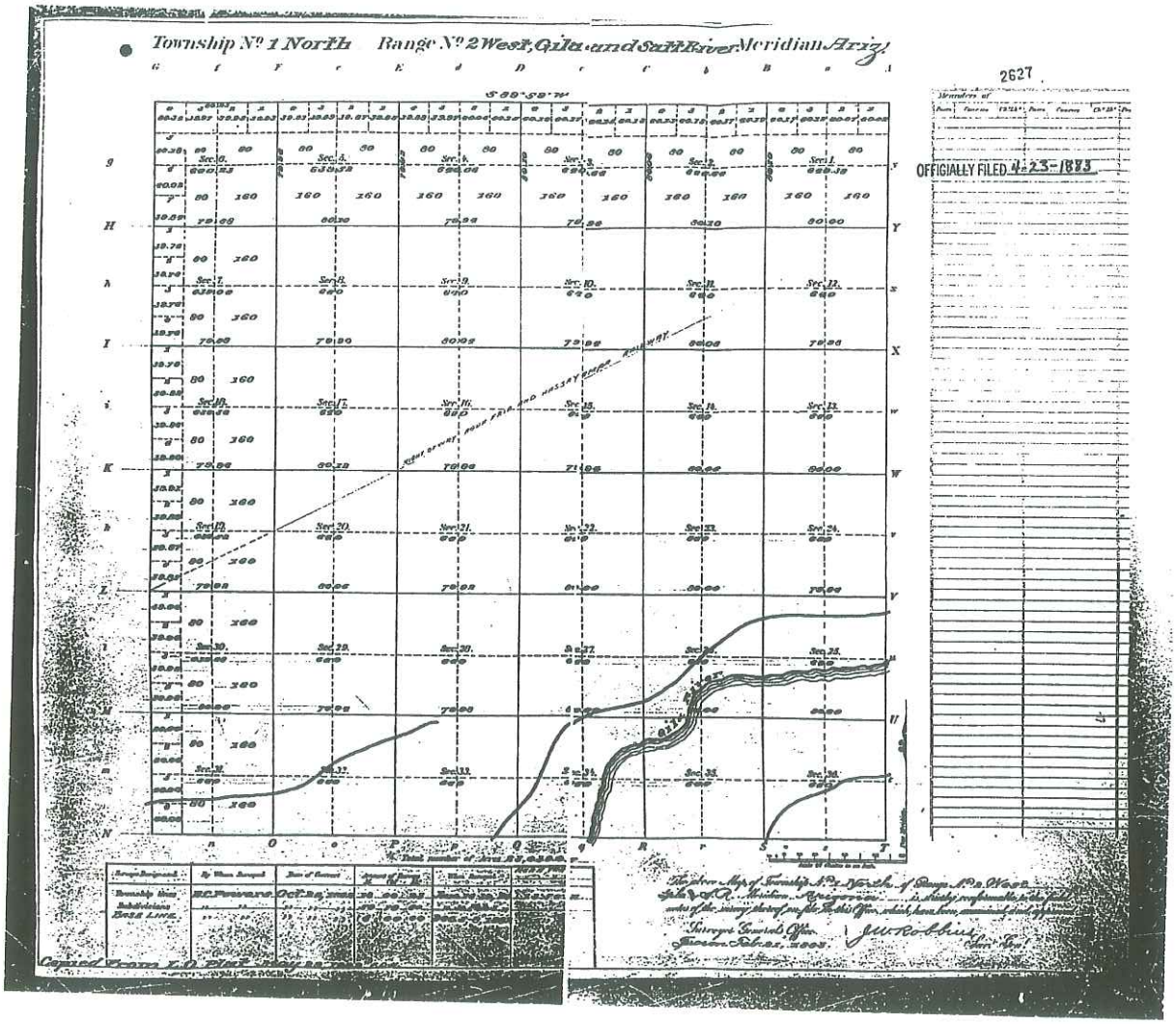
4. 1883 Interior Survey of Township 1 North, Range 2 West (Plat)

Like the field notes, the plat of township 1 north, range 2 west (see below), drawn by Powers, gives no suggestion that Powers thought the Gila was navigable. There are no meander lines along the Gila on the plat. No surveyor is identified on the plat as having undertaken meanders, and the box in the right margin labeled "meanders of" contains no entries for meander data. The plat does indicate, however, that roads ran parallel to the stream on both banks, suggesting that commerce was carried on in the valley by land and not by water.[25]

---

[24] "Survey Field Notes of Township 1 North, Range 2 West, Gila and Salt River Meridian," 1883, vol. R1006, pp. 7, 22-24, 92, U.S. Bureau of Land Management, Phoenix, Arizona.

[25] Survey Plat of Township 1 North, Range 2 West, Gila and Salt River Meridian, 1883, U.S. Bureau of Land Management, Phoenix, Arizona.



Survey Plat of Township 1 North, Range 2 West, 1883, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

5. 1907 Interior Resurvey of Township 1 North, Range 2 West (Field Notes)

Between May 29 and June 16, 1907, John F. Hesse resurveyed township 1 north, range 2 west. Nowhere in the field notes did he record any meander data. Hesse did, however, indicate that the stream was eighteen inches to two feet deep, and in his general description of the township, Hesse wrote that the soil was generally "1st. rate, and if supplied with water would

raise abundant crops. . . ." He added that "The southwestern cor. of the township is settled and is well watered by the Buckeye canal which runs through the township."[26]

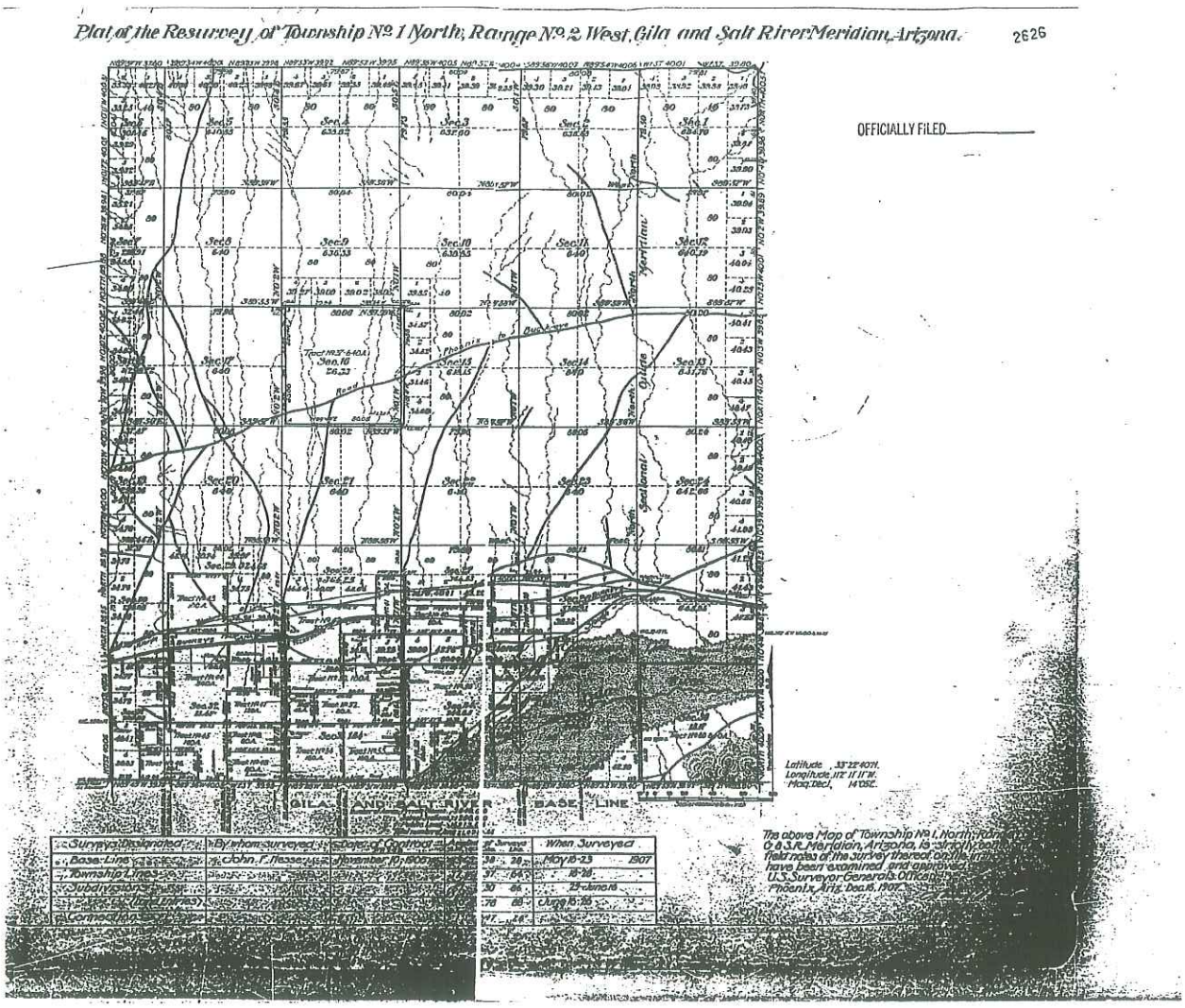
6. 1907 Interior Resurvey of Township 1 North, Range 2 West (Plat)

On the plat of the 1907 resurvey of this township (see below), Hesse drew no meander lines, and no surveyor is identified on the plat as having undertaken meanders. Moreover, no meander data appear in the margins of the plat. Roads on the plat parallel the river, and several irrigation ditches are shown, including the Buckeye Canal mentioned by Hesse.[27]

---

[26] "Resurvey Field Notes of Township 1 North, Range 2 West, Gila and Salt River Meridian," 1907, vol. R2055, pp. 105, 109, 133, U.S. Bureau of Land Management, Phoenix, Arizona.

[27] Resurvey Plat of Township 1 North, Range 2 West, Gila and Salt River Meridian, 1907, U.S. Bureau of Land Management, Phoenix, Arizona.



Plat of Resurvey of Township 1 North, Range 2 West, 1907, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

7. 1883 Interior Survey of Township 1 South, Range 2 West (Field Notes)

Moving down the Gila, R.C. Powers undertook the survey of the interior section lines for township 1 south, range 2 west, between January 11 and 15, 1883. In each encounter with the Gila River in this township, Powers treated the stream in his field notes as a non-navigable body of water. He set no meander posts at the edges of the stream where section lines intersected it, and he ran no meander lines along the stream. His only comment on the river was in the general

description of the township at the end of the notes, where he indicated that there was "plenty of water in the Gila River for irrigation."[28]

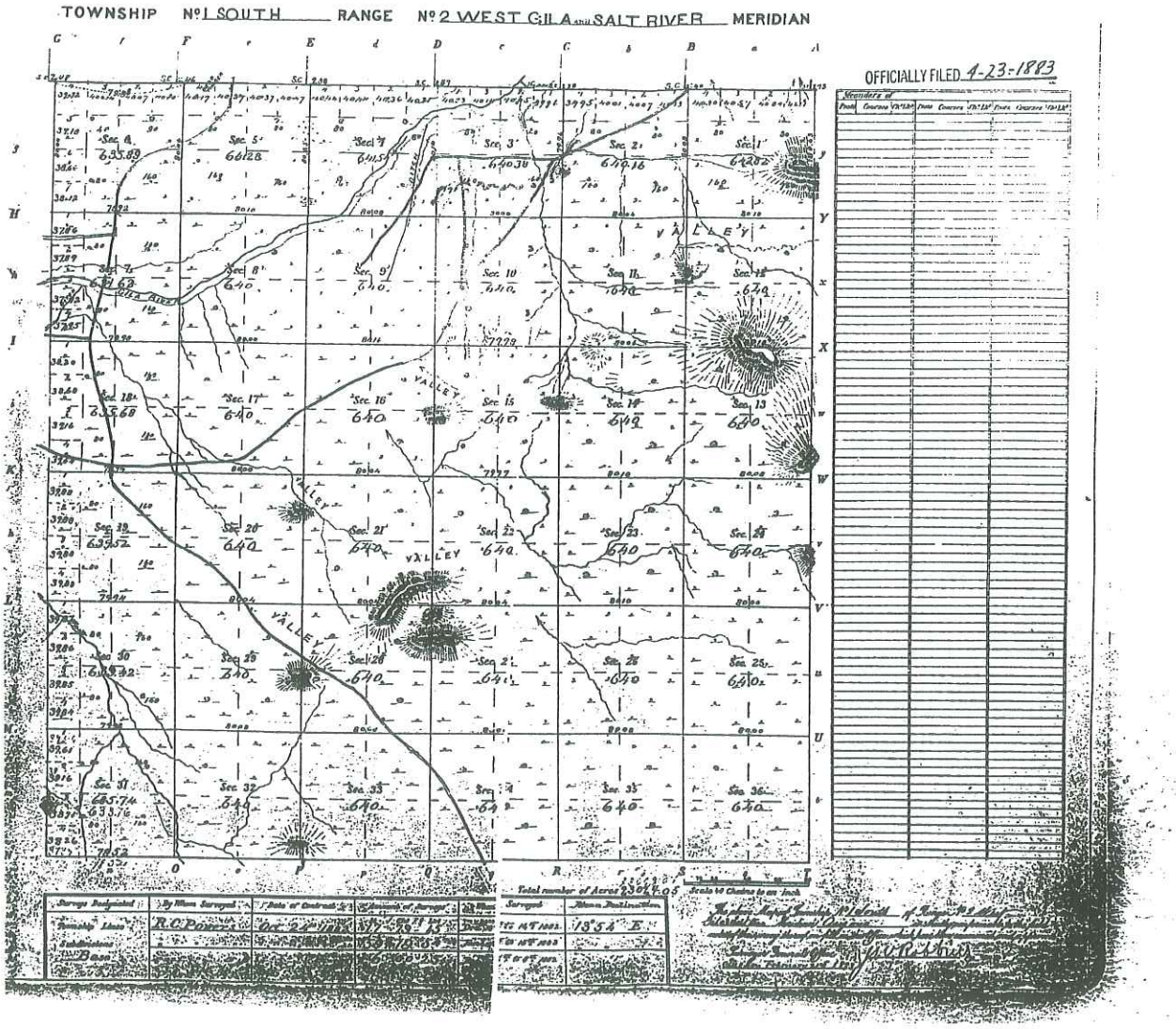
8. 1883 Interior Survey of Township 1 South, Range 2 West (Plat)

On February 21, 1883, Surveyor General J.W. Robbins approved the survey plat filed with his office of township 1 south, range 2 west (see below). Suggesting that Surveyor R.C. Powers did not consider the Gila to be navigable is the fact that no meander lines appear on the plat. Furthermore, in the right hand margin there is a blank table to record meander bearings of any navigable bodies of water, but no data are filled in. Other indicators on the plat that further suggest that the Gila was not navigable include a dam across the river and the presence of irrigation ditches. Moreover, a road roughly parallels the river on the south side.[29]

---

[28] "Field Notes of the Survey of Subdivision Lines of Township 1 South, Range 2 West, Gila and Salt River Meridian," 1883, vol. R1166, pp. 50, 65, 67, 89, and 97, with quotation at 97, U.S. Bureau of Land Management, Phoenix, Arizona.

[29] Survey Plat of Township 1 South, Range 2 West, Gila and Salt River Meridian, 1883, U.S. Bureau of Land Management, Phoenix, Arizona.



Survey Plat of Township 1 South, Range 2 West, 1883, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

E. U.S. GOVERNMENT SURVEYS ALONG THE GILA RIVER (EXHIBIT 3)

Moving downstream, the next area of focus for this report is covered in Exhibit 3 and encompasses parts of townships 3, 4, and 5 south, ranges 4 and 5 west.

1. 1871 Interior Survey of Township 4 South, Range 4 West (Field Notes and Plat)

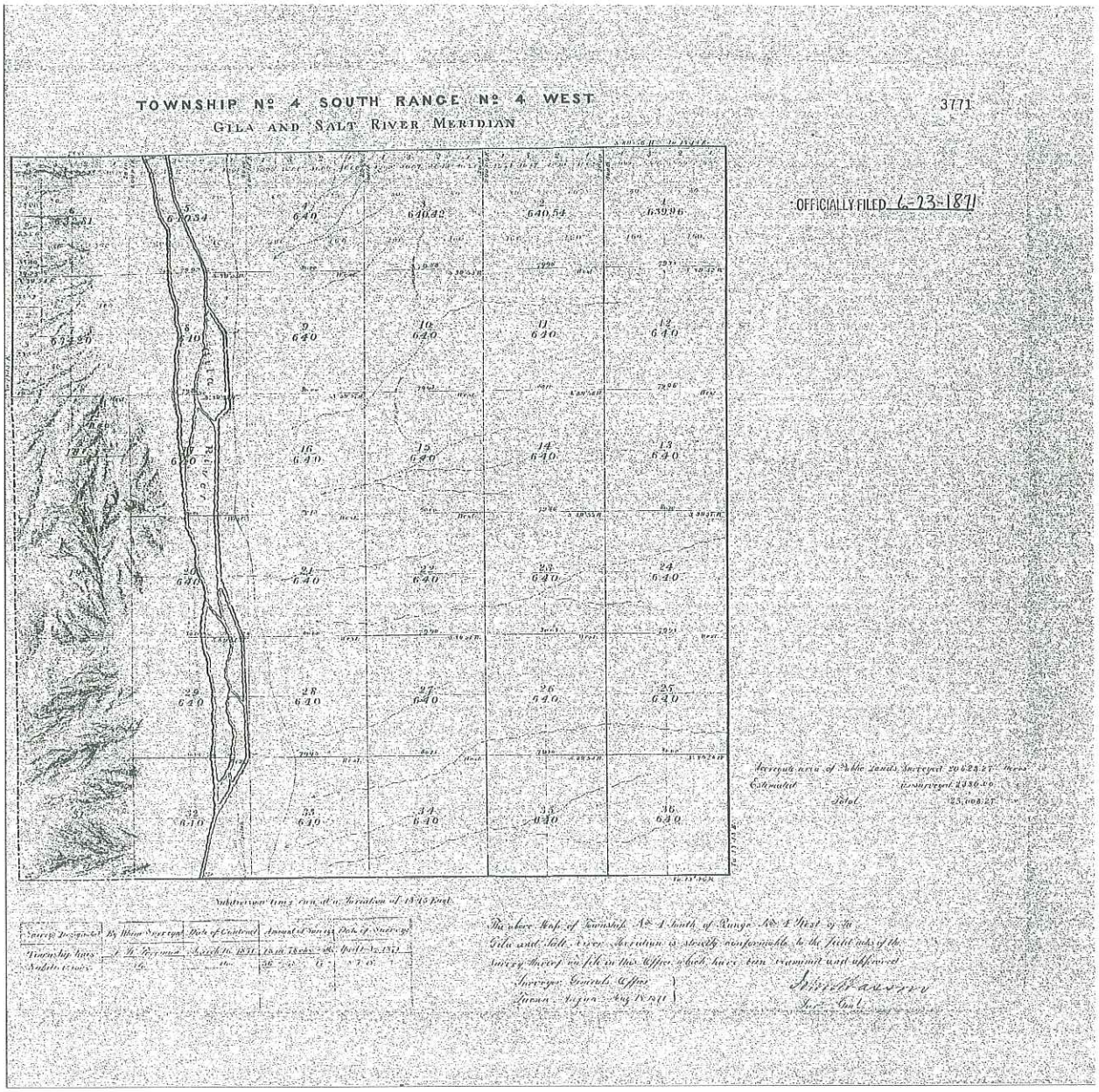
Solomon W. Foreman surveyed the interior subdivision lines of townships 4 and 5 south, range 4 west, between March 21 and April 15, 1871. In township 4 south, range 4 west, the Gila River flowed in several channels from north to south through sections 5, 8, 17, 20, 29, and 32, and Solomon recorded no meander bearings in the volume of field notes containing the details of this township's survey. Moreover, no meander data appear on the plat of the survey (reproduced below) and in the box on the plat identifying which surveyors accomplished various parts of the township's survey, there is no entry for a meander surveyor.[30]

The lack of meander data for the Gila River in this township is one indication that the Gila River was not navigable. Also, the fact that Foreman noted the presence of a road running parallel to the stream also suggests that the Gila River was not navigable.[31]

---

[30] Survey Plat of Township 4 South, Range 4 West, Gila and Salt River Meridian, 1871, U.S. Bureau of Land Management, Phoenix, Arizona.

[31] "Field Notes of the Survey of the Sub-division Lines in Township No. 4 South, Range No. 4 West, of Gila and Salt River Meridian," 1871, vol. 1161, pp. 49-52, 61-62, U.S. Bureau of Land Management, Phoenix, Arizona.



Survey Plat of Township 4 South, Range 4 West, 1871, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

2. 1871 Interior Survey of Township 5 South, Range 4 West (Field Notes and Plat)

Solomon Foreman also surveyed township 5 south, range 4 west, at about the same time he undertook survey work for the township discussed in the previous two paragraphs. In

township 5 south, range 4 west, the Gila coursed through sections 5, 7, 8, and 18, and in this township in each encounter with the Gila River, Foreman did set meander markers, but only on the left edges of the Gila (facing downstream). He also meandered that bank and recorded those meander details in his field notes, but not on the plat (see below for a copy of the plat).[32]

The reason for Foreman's use of meanders along one bank of the Gila can be seen best in conjunction with both his surveying instructions and the survey manual in use at the time, the 1864 version. First, with regard to his surveying instructions, Foreman had been directed on February 13, 1871, by John Hasson, U.S. Surveyor General for Arizona, to carry out this survey "in accordance with law and the Manual of printed Instructions by the General Land Office[.]" Hasson also told Foreman to bear "in mind the object of this work you are about to execute, is to accommodate actual settlers" who lived in the vicinity of Gila Bend. For this reason, Hasson added, "If in your judgment the Gila River should be meandered, you are hereby authorized and directed to do it, at the same time advising this office, in writing, the reasons therefor."[33]

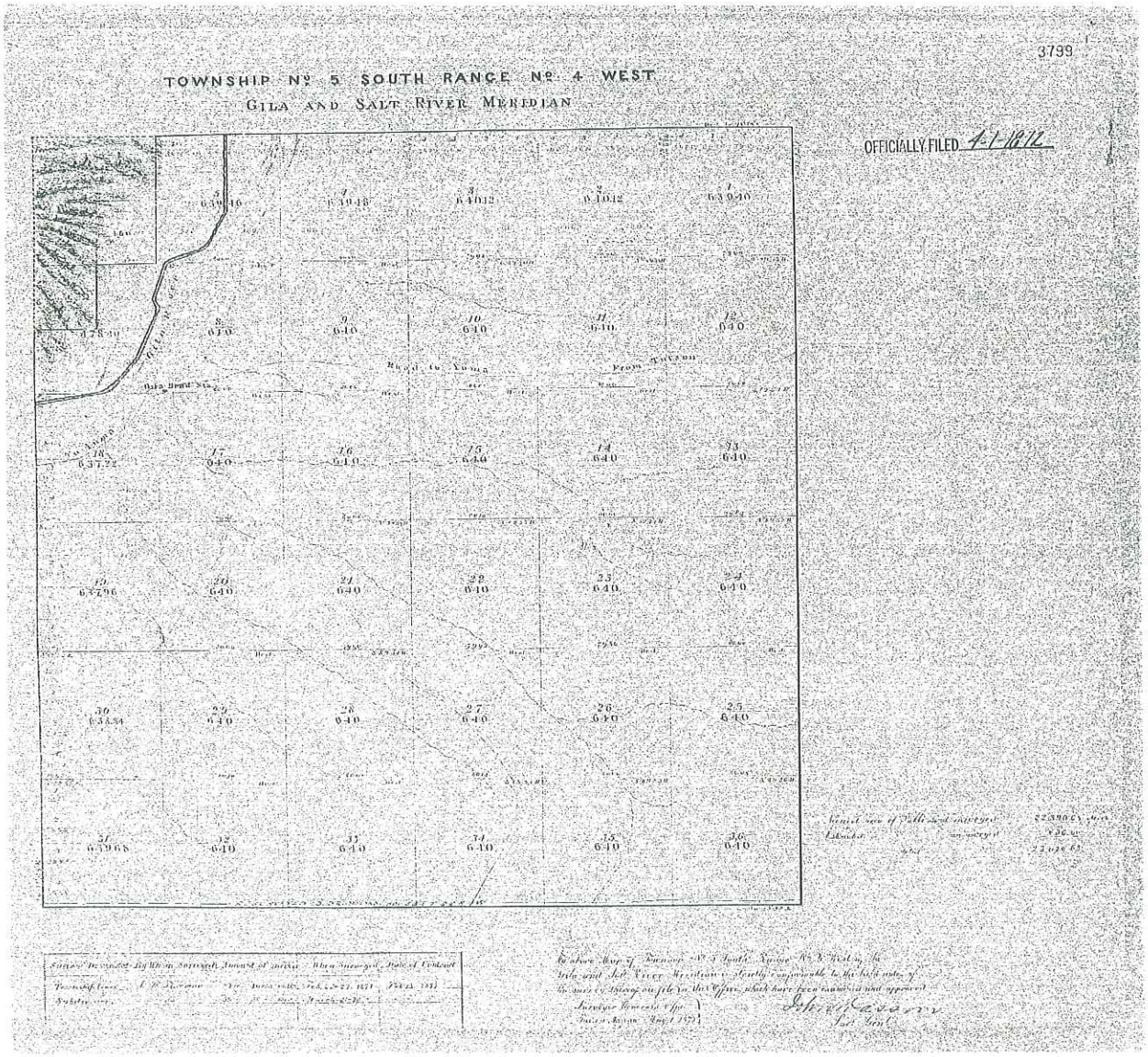
Foreman did, in fact, explain his one-bank meanders in his field notes as Hasson had instructed him to do. Even though setting meander corners on the right banks of "rivers not embraced in the class denominated 'navigable' under the statute, but which are well-defined natural arteries of internal communication, and have a uniform width" was required under the provisions of the 1864 surveying manual, Foreman explained in the meander section of the field notes for this township that "the reason for selecting the left bank for meanders is that all the lands of value are on the left bank[.]" He added that the lands on the right bank soon "pinched

---

[32] "Field Notes of the Survey of the Subdivision Lines of Township 5 S., Range 4 W., Gila and Salt River Meridian," 1871, pp. 56, 58, 60, 64-65, U.S. Bureau of Land Management, Phoenix, Arizona; Survey Plat of Township 5 South, Range 4 West, Gila and Salt River Meridian, 1871, ibid.

[33] U.S. Surveyor General for Arizona John Hasson to Solomon W. Foreman, Feb. 13, 1871, Letters Received from the Surveyors General of Public Land States, 1826-83, Arizona, 1863-76, box 2, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

out" due to the proximity of mountains. In other words, the only lands useful for farming were along the left bank, and for that reason, Foreman had meandered that bank as Hasson had told him to do.[34]



Survey Plat of Township 5 South, Range 4 West, 1871, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

---

[34] "Field Notes of the Survey of the Subdivision Lines of Township 5 S., Range 4 W., Gila and Salt River Meridian," 1871, pp. 56, 58, 60, 64-65, U.S. Bureau of Land Management, Phoenix, Arizona.

F. U.S. GOVERNMENT SURVEYS ALONG THE GILA RIVER (EXHIBIT 4)

The next sample area downstream encompasses parts of townships 7 and 8 south, and parts of ranges 16 to 18 west.

1. 1878 Interior Survey of Township 8 South, Range 16 West (Field Notes)

The interior subdivision lines of townships 7 and 8 south, range 16 west, were surveyed by John L. Harris between January 21 and 31, 1878. Because Gila River cut through only a small part of township 7 south, range 16 west, that township's survey will not be discussed here. Nevertheless, Harris's treatment of the Gila in both townships was similar and indicated a non-navigable river.

The field notes of Harris's survey of township 8 south, range 16 west, were approved by the Surveyor General on April 1, 1878. This survey was done under the terms of the 1864 federal surveying manual.

The Gila River cut through parts of sections 1, 2, 3, 4, 5, 9, 7, 8, and 18 in this township, and at each of these places, Harris set no meander posts. Instead, he measured across on line as the directions provided for non-navigable bodies of water. Moreover, Harris wrote no meander survey data in his field notes, and he also observed the presence of an old bank of the river – suggesting channel changes – along the south side of the stream. Finally, like surveyor Foreman

in 1871, Harris also recorded the presence of the road from Yuma to Tucson running roughly parallel to and south of the stream.[35]

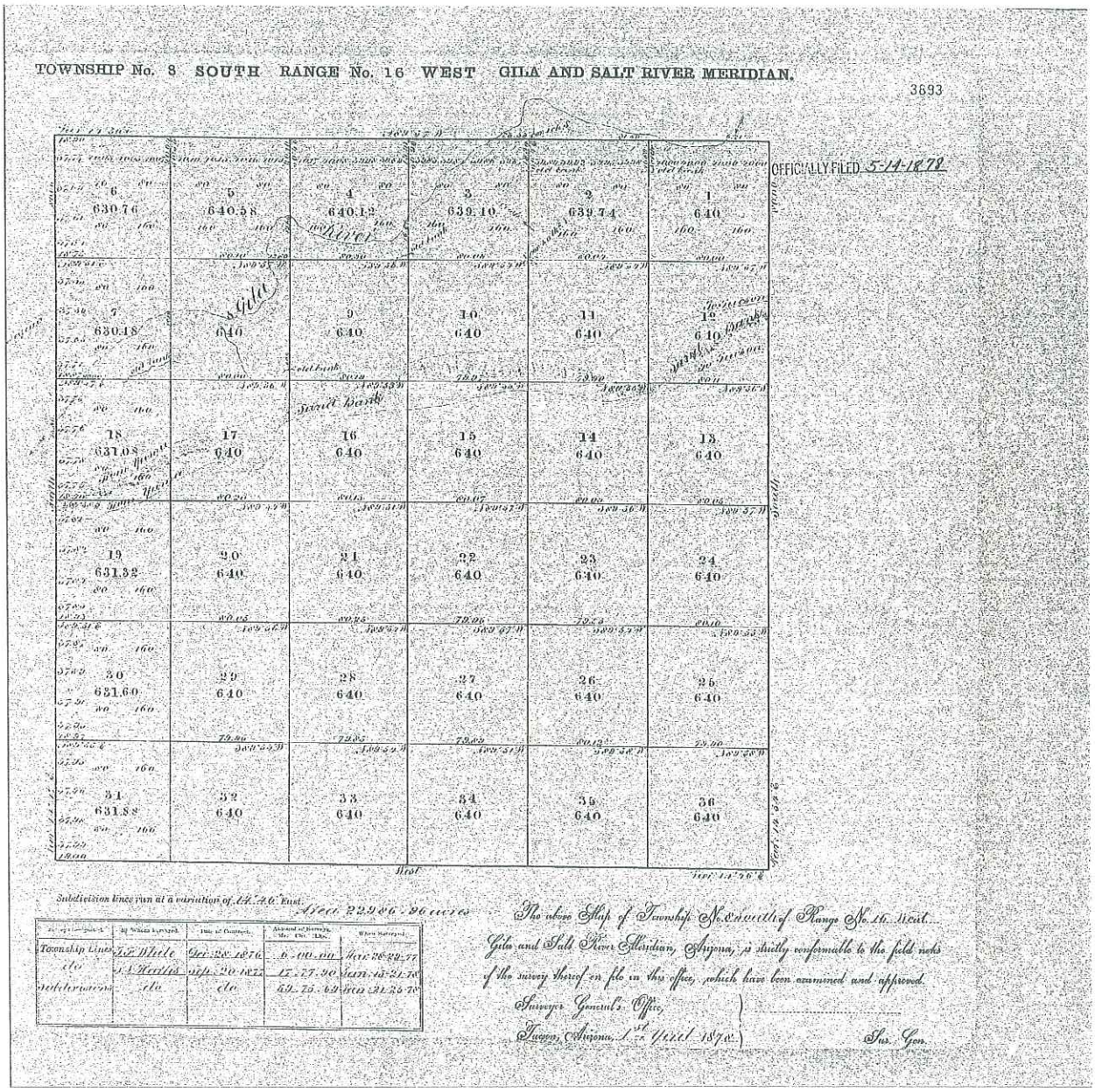
2. 1878 Interior Survey of Township 8 South, Range 16 West (Plat)

Harris's plat (see below) of township 8 south, range 16 west (which was approved by the Surveyor General on the same day as his field notes of the township) also indicated that Harris did not consider the Gila River to be navigable for several reasons. First, no meander data appear in the right margin, as it would have had Harris thought the river was navigable. Second, in the box at the bottom of the plat where surveyors and their respective surveys were listed, there are no entries for meander surveys. Third, the plat, like the field notes, clearly indicates that the road from Yuma to Tucson ran roughly parallel to the stream on its south side. Finally, Harris had drawn the "old bank" in at least five places where that feature crossed a section line. The presence of the old bank suggested that the stream had recently changed channel, suggesting its unreliability for commercial transport.[36]

---

[35] "Field Notes of the Subdivision Lines of Township 8 South, Range 16 West, Gila and Salt River Meridian," 1878, vol. 1171, pp. 11, 22, 33, 43, 44, 56-58, 61, U.S. Bureau of Land Management, Phoenix, Arizona.

[36] Survey Plat of Township 8 South, Range 16 West, Gila and Salt River Meridian, 1878, U.S. Bureau of Land Management, Phoenix, Arizona.



Survey Plat of Township 8 South, Range 16 West, 1878, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

3. 1878 Interior Survey of Township 8 South, Range 17 West (Field Notes)

Harris also surveyed the interior subdivision lines of township 8 south, range 17 west.

The field notes of this survey, which was done between February 7 and 11, 1878, were approved

by the Surveyor General on April 1, 1878. In this township, the Gila River crossed sections 13, 14, 11, 15, 22, 21, 20, and 19. At the lines between each of these sections, Harris set no meander posts. In addition, he wrote in his general description of the township that the Gila River's waters could be useful for irrigation. He gave no similar indication that shipping could be accomplished on the stream: "With the exception of some poor soil immediately along the river, and along a sand bank extending across the township just S. of the river, this entire township presents a surface of very rich soil, while the Gila river flowing through the center of the township contains an abundance of water which can be used for the irrigation of the lands in this township."[37]

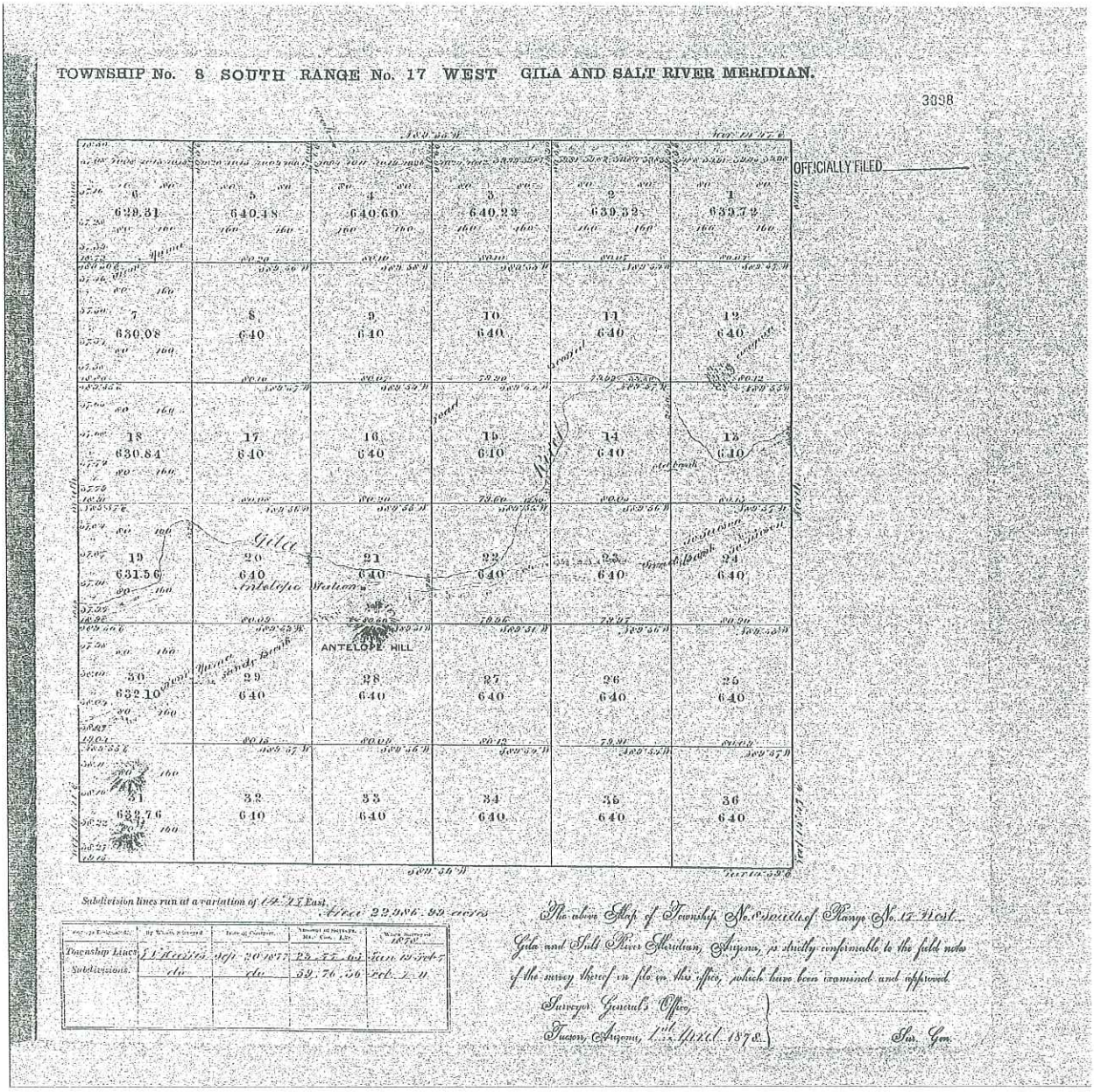
4. 1878 Interior Survey of Township 8 South, Range 17 West (Plat)

Like the field notes of township 8 south, range 17 west, several features of the plat of that township (see below) indicate that Harris did not consider the Gila to be navigable. First, there are no meander data in the right margin of the plat as there would have been had he considered the stream to be navigable. Second, there is no entry for any surveyor having done meander lines in the box recording who undertook what portion of the surveys of the township. Finally, the presence of two roads roughly paralleling the river – one to the north and the other to the south – suggested that the river was not used to carry commerce or people.[38]

---

[37] "Field Notes of the Subdivision Lines of Township 8 South, Range 17 West, Gila and Salt River Meridian," 1878, vol. 1172, pp. 1, 18, 19, 27, 28, 38, 51, and 61 (with quotation at 61), U.S. Bureau of Land Management, Phoenix, Arizona.

[38] Survey Plat of Township 8 South, Range 17 West, Gila and Salt River Meridian, 1878, U.S. Bureau of Land Management, Phoenix, Arizona.



Survey Plat of Township 8 South, Range 17 West, 1878, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

G. U.S. GOVERNMENT SURVEYS ALONG THE GILA RIVER (EXHIBIT 5)

Exhibit 5 covers parts of township 8 south, ranges 21 and 22 west, and is the most downstream sample area reviewed in this report. This Exhibit covers lands near Yuma, Arizona.

1. 1890 Interior Survey of Township 8 South, Range 21 West (Field Notes)

The next sample area downstream is township 8 south, range 21 west. The initial subdivision survey of this township was done between September 18 and October 4, 1890, by James H. Martineau using the new manual for surveying instructions that had been issued on January 1, 1890. The field notes of the survey were approved on December 19, 1890, by the Surveyor General.

The Gila River ran from east to west through parts of sections 1, 2, 3, 4, 9, 8, 17, 18, and 19, and at each place where Martineau encountered the Gila River on lines between these sections, he set meander corners on both banks. He observed that the Gila was in some places well over five chains wide, and in some places it was so deep that he was forced to swim to the other bank to continue running section lines. Despite these statements, Martineau clearly did not consider the Gila River to be navigable because he explained in his field notes that his setting of meander corners on both banks was consistent with the new January 1890 instructions directing surveyors to meander both banks of non-navigable bodies of water if on average they were more than three chains wide. Confirming the lack of navigability of the Gila, Martineau also noted the presence of the road from Yuma to Gila City and the Southern Pacific Railroad, both of which paralleled the stream.[39]

---

[39] "Field Notes of the Subdivision Lines and Meanders of Township 8 South, Range 21 West, Gila and Salt River Meridian," 1890, vol. 1213, pp. 34-35, 38-39, 44-46, 47, 49-54; vol. 1214, pp. 56-59, 62-64, U.S. Bureau of Land Management, Phoenix, Arizona.

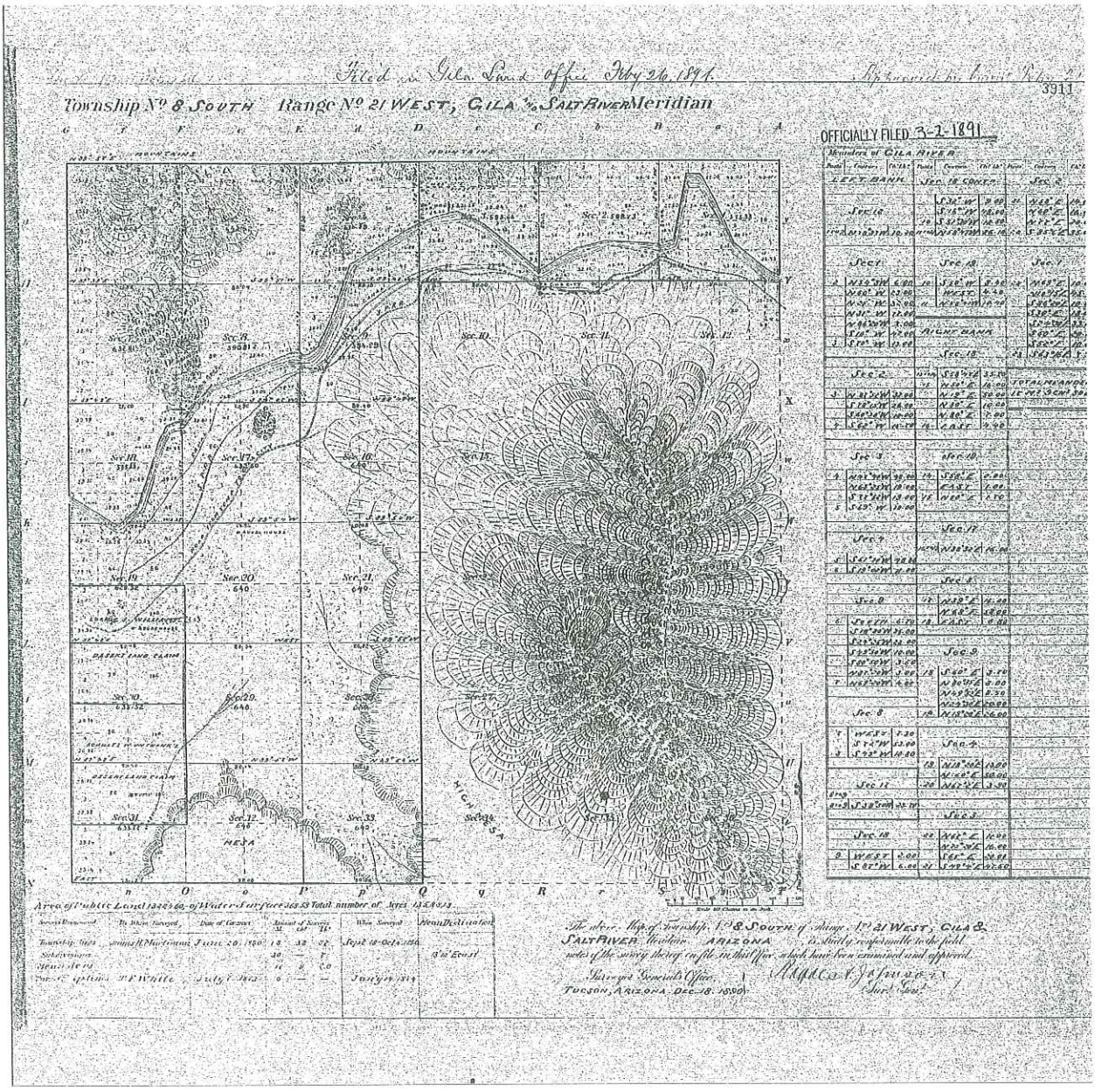
2. 1890 Interior Survey of Township 8 South, Range 21 West (Plat)

The plat of this township (see below), which was approved by the Surveyor General on December 18, 1890, clearly indicates that the Gila River had been meandered. Meander notes appear in the right margin of the plat labeled "Meanders of Gila River," and Martineau is identified as the meander surveyor in the box listing surveyors and the parts of the township survey they had undertaken. Moreover, meander lines are apparent on the plat itself. In addition, immediately below the plat is the notation that water surface area amounted to 368.58 acres (indicating acreage within the meander lines).

Nevertheless, Martineau noted the road from Yuma to Gila City (which he also recorded in the field notes), and on the plat that road ran parallel to the river on its north side, while the Southern Pacific Railroad was shown parallel to the river on the south side.[40] Both the road and railroad suggest that the principal means of transportation in the region was by land, not water.

---

[40] Survey Plat of Township 8 South, Range 21 West, Gila and Salt River Meridian, 1890, U.S. Bureau of Land Management, Phoenix, Arizona.



Survey Plat of Township 8 South, Range 21 West, 1890, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

3. 1874 Interior Survey of Township 8 South, Range 22 West (Field Notes)

The field notes of the 1874 survey of the next township downstream (township 8 south, range 22 west) corroborate that Martineau's meanders of the Gila had been done because the

stream was non-navigable and over three chains wide. Between February 26 and March 4, 1874, Theodore F. White surveyed the interior subdivision lines in township 8 south, range 22 west, and the field notes of that survey were approved on May 9, 1874, by the Surveyor General. The Gila River ran through the township from east to west, crossing parts of sections 13, 24, 23, 22, 15, 21, 20, 29, and 30.

In addition to running section lines, White meandered the Gila River, but not because he deemed it navigable. White's surveying instructions were those found in the 1864 manual, which called for meandering only one bank of non-navigable streams that served as routes for internal communication. Following those instructions, White had meandered the right bank in sections 21, 20, 29, and 30, and the left bank in sections 22, 23, 24, and 13. He indicated in his notes that he shifted from one bank to the other as the surveying instructions provided because of the difficulty in finishing the one-bank meander on the right bank.[41]

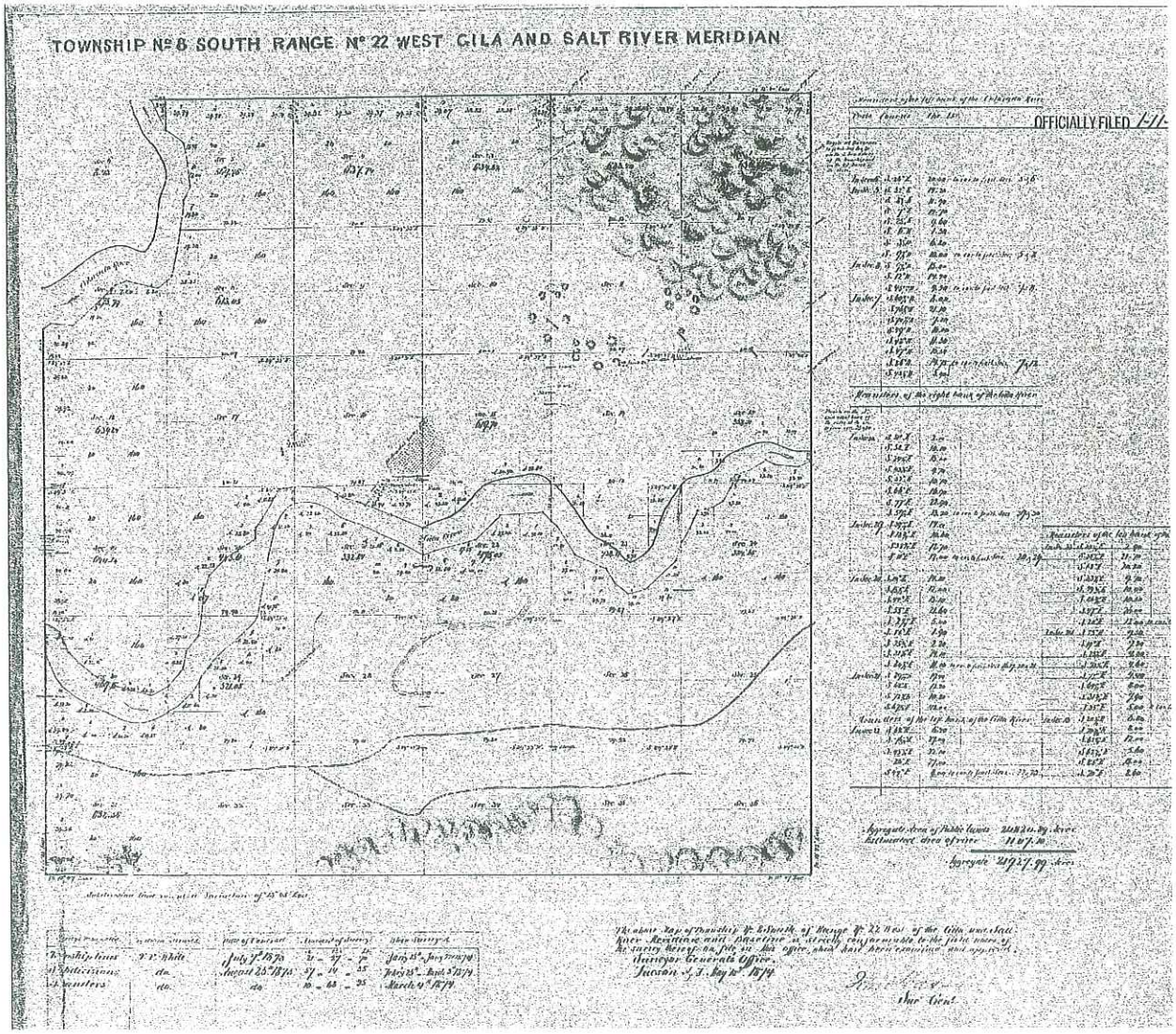
4. 1874 Interior Survey of Township 8 South, Range 22 West (Plat)

White's plat of township 8 south, range 22 west (see below), was approved on May 10, 1874, by the Surveyor General. Several features of this plat are noteworthy in relation to the question of the navigability of the Gila River. First and most obviously are the presence of meander data in the right margin of the plat and identification of White as the surveyor who had done meanders at the bottom of the plat. The meander data illustrated that only one bank was meandered in each section. The drawing of the river itself showed more rigid angular bends in

---

[41] "Field Notes of the Survey of the Subdivision Lines of Township 8 South, Range 22 West, Gila and Salt River Meridian," 1874, vol. 1174, pp. 5, 6, 16, 27-28, 38, 48-49, 60-62, U.S. Bureau of Land Management, Phoenix, Arizona.

the river's bank on one side where the meanders were conducted. In addition, a road ran paralleling the Gila to the south.[42]



Survey Plat of Township 8 South, Range 22 West, 1874, Gila and Salt River Meridian, U.S. Bureau of Land Management, Phoenix, Arizona

[42] Survey Plat of Township 8 South, Range 22 West, Gila and Salt River Meridian, 1874, U.S. Bureau of Land Management, Phoenix, Arizona.

H. U.S. GOVERNMENT SURVEYS ALONG THE GILA RIVER OUTSIDE EXHIBITS 2 TO 5

The survey field notes and plats of the sample areas discussed above clearly indicate that multiple surveyors – undertaking their surveys in different years and at disparate times of year – all reached the same conclusion that the Gila River was not navigable. Nothing in survey data from other townships along the Gila between the Salt and Colorado rivers contradicts these findings. Nevertheless, a few other examples from field notes and plats not on Exhibits 2-5 will underscore the unanimity among federal surveyors, whose work was done over many years and at differing times of year that the Gila was not navigable. These will be discussed in a down-river fashion.

1. 1871 Interior Survey of Township 5 South, Range 5 West (Field Notes)

Between March 4 and 11, 1871, Solomon W. Foreman surveyed the interior subdivision lines of township 5 south, range 5 west. The Gila River flowed westward through sections 13, 14, 15, 16, 9, 8, and 7 of this township. As Foreman ran the line north between sections 13 and 14, he first crossed the road to Yuma, running parallel to the Gila River. He then encountered the Gila at 67.80 chains, and he set a meander post on the left (south) bank of that stream. In addition, he observed that the "river runs west & has a smooth lively current. Water not too deep to cross on line." Reaching the right bank, Foreman set another corner, noting that the bank was "low on n. side & land subject to overflow."[43] He made similar observations and set posts (sometimes calling them meander posts and sometimes not) while running the lines between

---

[43] "Field Notes of the Survey of Township 5 South, Range 5 West, Gila and Salt River Base and Meridian," 1871, vol. 1164, p. 7, U.S. Bureau of Land Management, Phoenix, Arizona.

sections 14 and 15, 15 and 16, 16 and 9, 9 and 8, and 8 and 7. Foreman subsequently listed the meanders of the Gila in this township.[44]

Following the meander data, Foreman added what he called "explanations and description" for the township. In this part of the field notes, he observed that while he had set meander corners on both banks of the stream throughout the township where section lines crossed the Gila, he actually only had meandered the left bank. This was consistent with the 1864 surveying manual, which provided that non-navigable bodies of water were to be meandered if they were more than three chains wide and were well-defined routes for internal communication. Foreman explained:

> The lands north of the Gila River being almost worthless, on account of the low bottom land & the near approach of the mountains to the river & the banks on the south side being high & the lands superior quality, I deemed it best to meander the left bank of the river. The Gila is at times subject to very high freshets, and at all times even at a low stage of water as at present runs a volume of water equal to about 100,000 inches. It has a fall of about 20 feet to the mile in this township and flows over a sandy bottom and is fordable at nearly all points except in time of high water, when it becomes almost impassable for boats [to cross the river], which precludes men from owning farms lying on both sides of the river – hence the necessity for meandering the stream. The lands in this township south of the Gila is [sic] of very superior quality for agricultural purposes and can mostly be irigated [sic] from the river. A company is almost organized to construct an immense canal, beginning 20 miles above here and leading the water down & parallel to the river to a point some 12 miles below this township.[45]

2. 1871 Interior Survey of Township 5 South, Range 6 West (Field Notes)

Foreman also surveyed the subdivision lines of township 5 south, range 6 west, in 1871. The Gila River flowed through parts of sections 1 and 2 of this township, and as he had in his

---

[44] "Field Notes of the Survey of Township 5 South, Range 5 West, Gila and Salt River Base and Meridian," 1871, vol. 1164, pp. 16, 26, 39, 41, 56, 61-63, U.S. Bureau of Land Management, Phoenix, Arizona.

[45] "Field Notes of the Survey of Township 5 South, Range 5 West, Gila and Salt River Base and Meridian," 1871, vol. 1164, pp. 60-61, U.S. Bureau of Land Management, Phoenix, Arizona.

field notes of township 5 south, range 5 west, Foreman recorded meanders of the left bank of the stream in this township. He offered this explanation for meandering only the left bank: "Note: The left bank of the river is taken by me in preference to the right bank because the lands north of the Gila in this township are worthless."[46]

3. 1910 Interior Survey of Township 5 South, Range 8 West (Field Notes)

On December 14 and 15, 1910, John F. Hesse surveyed part of the interior subdivision lines of township 5 south, range 8 west. This was the first survey of any subdivision lines in this township, and it covered only sections 3 to 6. The Gila River ran through parts of sections 5, 6, and through a corner of unsurveyed section 7. The survey field notes were approved by the Surveyor General on April 12, 1911.

Hesse's notes indicated that while most of the Gila was dry, a small stream ran through its bed about seven inches deep. No meander notes appeared in these field notes, and the index diagram page, which showed where notes for various lines were in the volume, had a blank line where a meander note page would be listed. Hesse wrote in his general description of the township: "The Gila River runs through secs. 5 and 6, a small stream of water which sinks in the sand and rises again all along its course through these secs. The water is very brackish and not good for domestic purposes."[47]

---

[46] "Field Notes of the Survey of the Subdivision Lines of Township 5 South, Range 6 West, Gila and Salt River Base and Meridian," 1871, vol. 1156, p. 62, U.S. Bureau of Land Management, Phoenix, Arizona.

[47] "Field Notes of the Survey of the Subdivision Lines of Township 5 South, Range 8 West," 1911, vol. 2233, pp. 1-2, 60 (with quotation at 60), U.S. Bureau of Land Management, Phoenix, Arizona.

I. SUMMARY AND CONCLUSIONS REGARDING U.S. GOVERNMENT SURVEYS ALONG THE GILA 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 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 areas along the Gila River were 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 Gila River as being a non-navigable stream.

CHAPTER II: LAND PATENTS AND STATE GRANTS

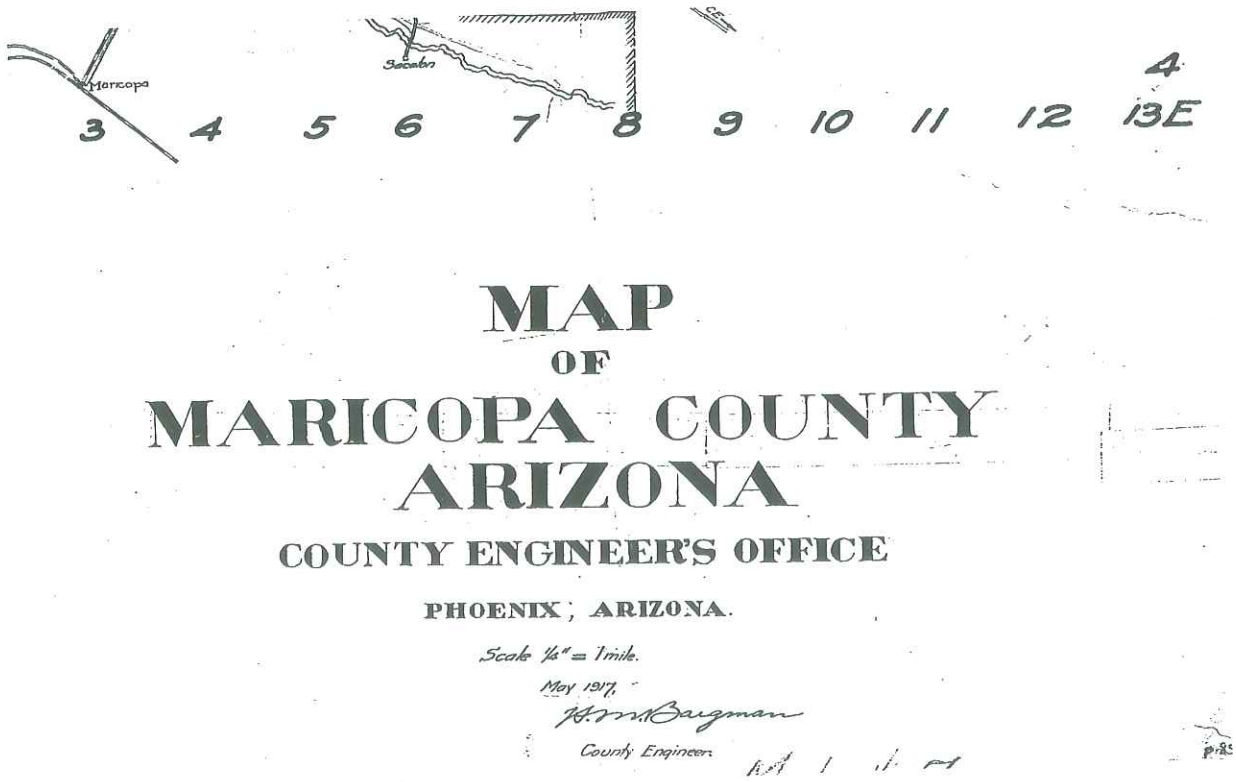
The U.S. Congress passed a variety of homestead laws in the middle-to-late nineteenth century designed to facilitate the settlement of newly acquired lands in the West. The laws resulted in thousands of federal patents being issued to settlers determined to establish homes and farms in the arid West.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

A. MAPS OF THE GILA RIVER REGION

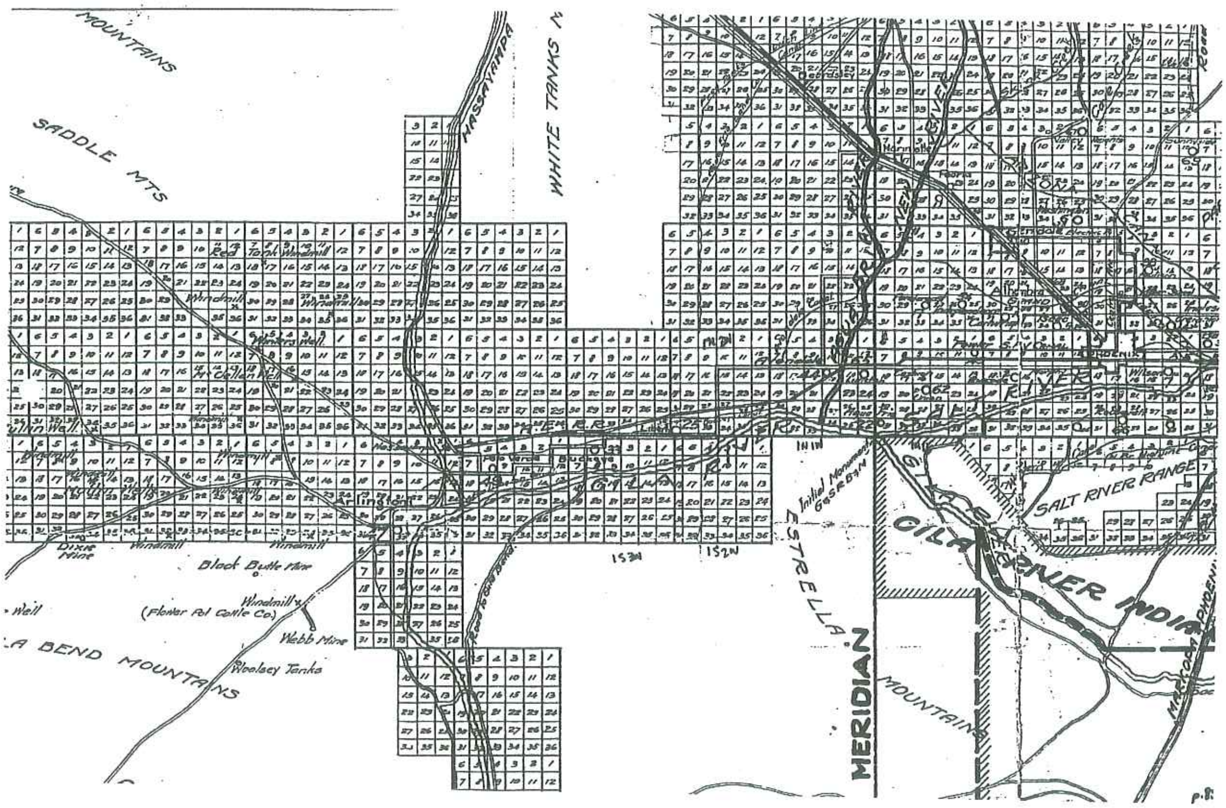
The U.S. Geological Survey – the agency known for creating the federal topographic maps for the entire United States – did not begin mapping the Gila River Basin until after Arizona's admission to the Union in 1912. U.S. Geological Survey topographic maps covering the Gila Basin below the Salt River on a scale of 1:100,000 – produced in the 1980s and 1990s – are reproduced in Chapter I. Other U.S. Geological Survey topographic maps on a scale of 1:24,000 covering the same area all date from the post-statehood era.

Prior to 1912, however, there were other detailed maps by other parties of the Gila River area between the Salt River and the Colorado River. As noted in Chapter I, the U.S. General Land Office conducted original surveys along the Gila beginning in 1868 to facilitate homesteading and to create accurate legal descriptions of property in the area. That agency's township plats cover large portions of the Gila River involved in this study, although not all are before Arizona's statehood. Other mapping of the region was undertaken by Maricopa and Yuma County Engineers and County Surveyors in the years around statehood. This work

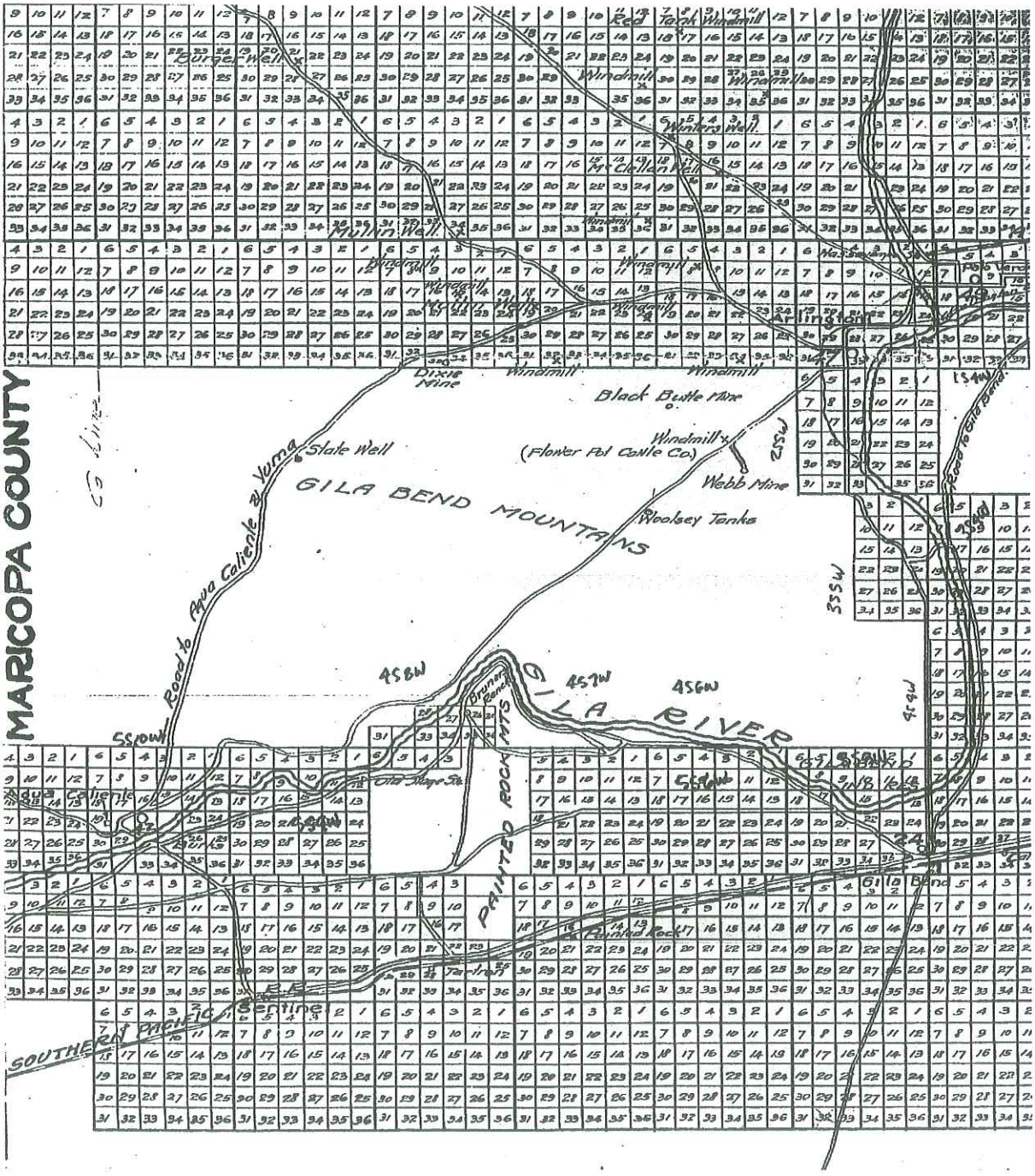
resulted in two maps: 1) "Map of Yuma County" by the County Surveyor, 1913; and 2) "Map of Maricopa County" by the County Engineer, 1917. (A third source, "Map of the Salt River Valley" drawn by Dwight B. Heard in 1915 was consulted for this report, but was unavailable for copying and inclusion in this report due to its size.) Portions of the 1913 Yuma County and 1917 Maricopa County maps have been reproduced below (each is in three segments). These maps were used to locate the geographic position of the Gila River as close to 1912 as possible on the Exhibit maps reproduced in Chapter I. The U.S. General Land Office survey plats were also utilized on the Exhibit maps to show the Gila's course when those maps were drawn. Comparing the General Land Office survey plats' location of the Gila to that of the 1913, 1915, and 1917 maps indicates a significant amount of channel change occurred over the years that would almost certainly have hindered navigation.



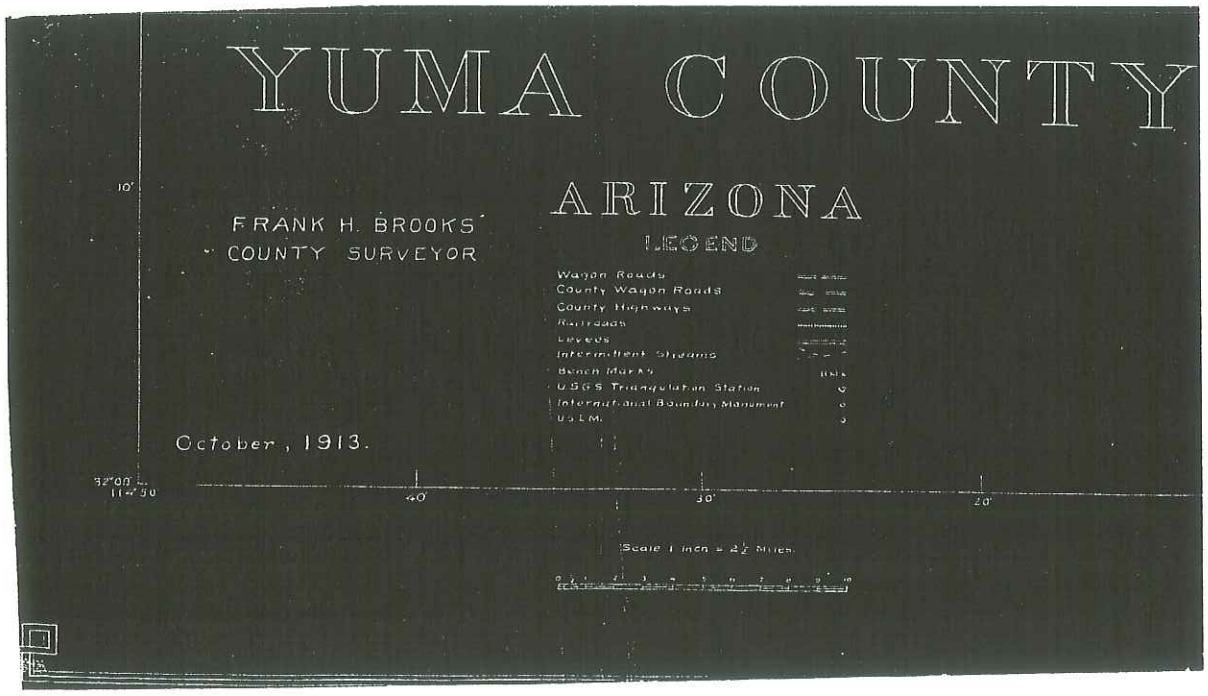
Title to "Map of Maricopa County, Arizona," County Engineer's Office, May 1917



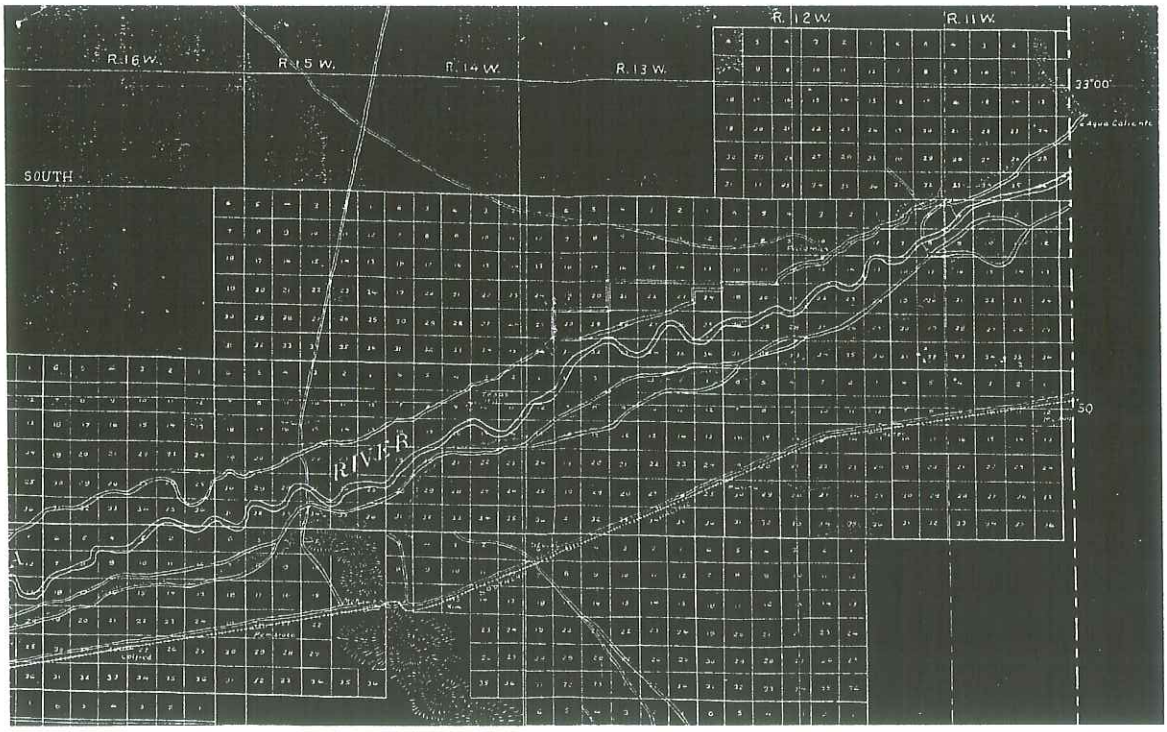
Portion of "Map of Maricopa County, Arizona" Showing Area near the Junction of the Gila and Salt Rivers Just West of Phoenix, County Engineer's Office, May 1917



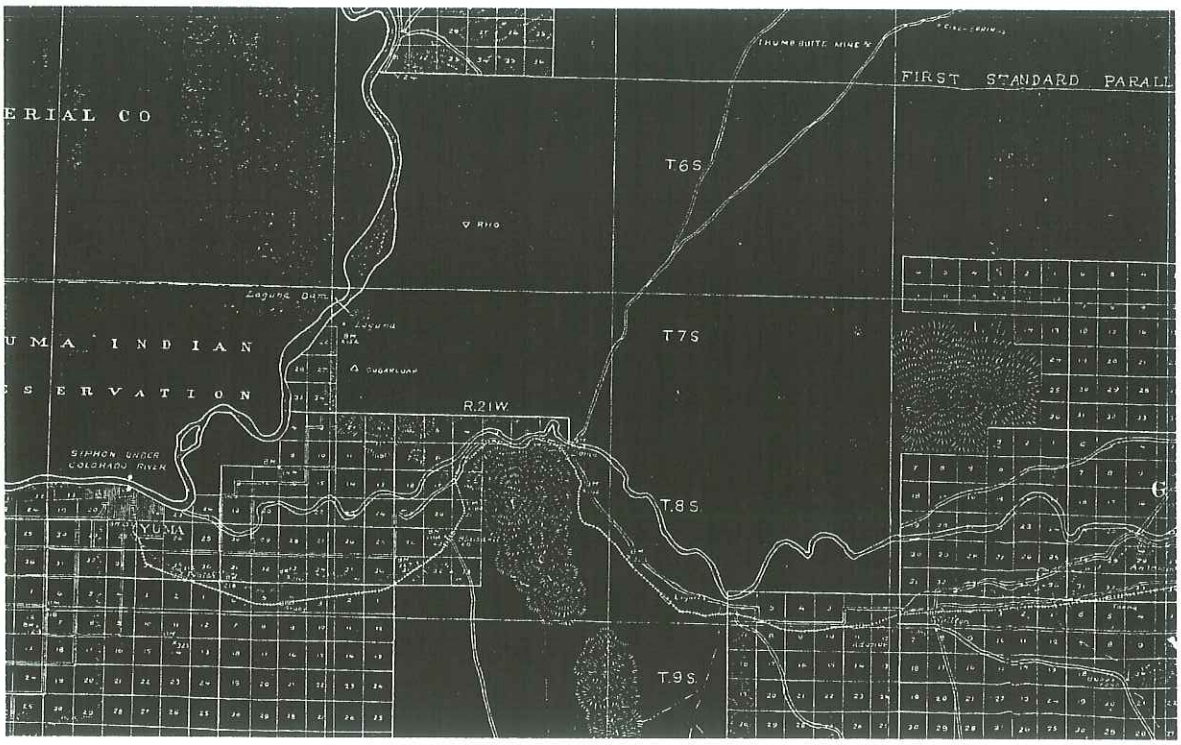
Portion of "Map of Maricopa County, Arizona" Showing along the Gila River near Gila Bend, County Engineer's Office, May 1917



Title to Map of "Yuma County, Arizona," Frank H. Brooks, County Surveyor, October 1913

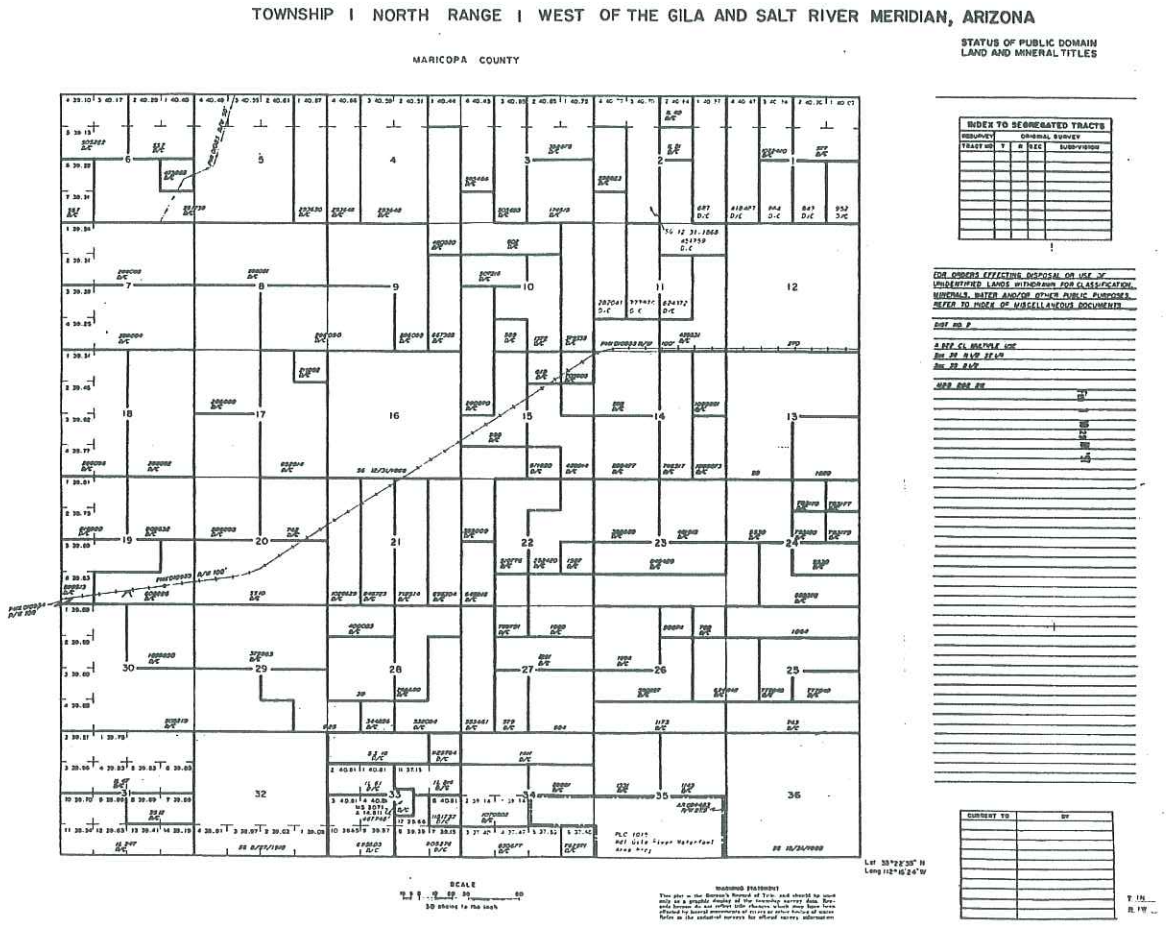


Second Portion of Map of "Yuma County, Arizona," Frank H. Brooks, County Surveyor, October 1913

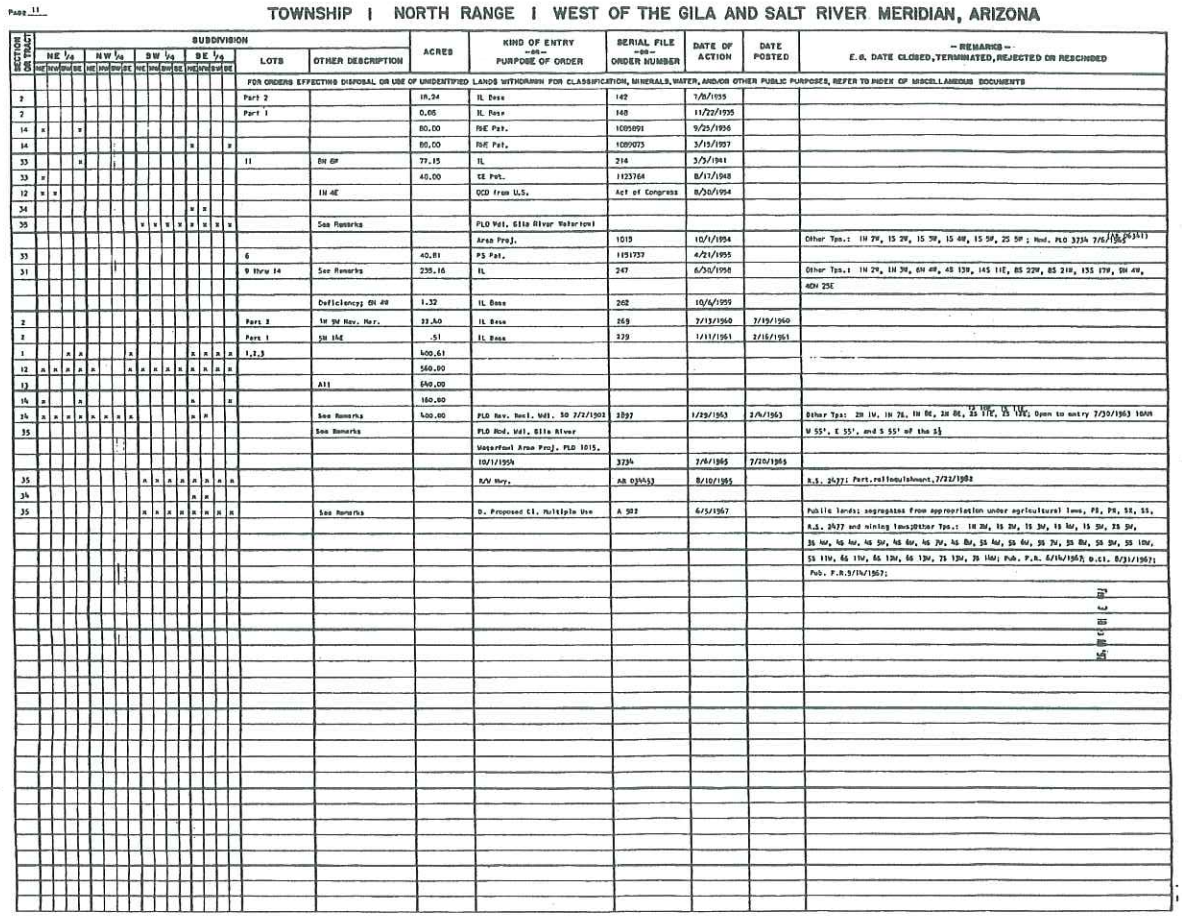


Portion of Map of "Yuma County, Arizona" near Confluence with the Colorado River, Frank H. Brooks, County Surveyor, October 1913

The U.S. Bureau of Land Management's Master Title Plats and Historical Indices were used to locate homestead patents in relation to the Gila River as it appeared on the U.S. General Land Office survey plats and the 1913, 1915, and 1917 maps (see below for examples of these documents). The Master Title Plats, which show how the U.S. Government has disposed of (or otherwise encumbered) the public domain, are township-by-township cartographic records of changes to the public domain; the Historical Indices contain the details on these changes.



Sample Master Title Plat to Lands in the Gila River Area, U.S. Bureau of Land Management, Phoenix, Arizona



Page 11

TOWNSHIP 1 NORTH RANGE 1 WEST 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
	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								
2		Part 2		19.34	IL Desa	142	7/8/1935		
2		Part 1		0.66	IL Desa	140	11/22/1935		
14	x x			80.00	RHE Pat.	1089092	9/25/1936		
14	x x			80.00	RHE Pat.	1089073	3/15/1937		
33	x	11	SW SW	77.15	IL	214	3/3/1941		
33	x			40.00	CE Pat.	1123764	8/17/1948		
12	x x		IN 4E		OCD from U.S.	Act of Congress	8/30/1954		
34	x x								
35	x x x x x x x x		See Remarks		FLO Wdl. Gila River Waterowl				
					Area Proj.	1010	10/1/1954		Other Tps.: IN 2W, IS 2W, IS 3W, IS 4W, IS 5W, 2S 5W; Mod. PLO 3234 7/6/1965
33		6		40.81	PS Pat.	1151732	4/21/1955		
31		9 thru 14	See Remarks	235.16	IL	247	6/30/1958		Other Tps.: IN 2W, IN 3W, 6N 4W, 4S 13W, 14S 11E, 8S 22W, 8S 21W, 13S 17W, 5N 4W, 4DN 2SE
			Deficiency SW 4W	1.32	IL Desa	262	10/6/1959		
2		Part 2	IN SW Nav. Mar.	33.40	IL Desa	269	7/13/1960	7/19/1960	
2		Part 1	SW 15E	.51	IL Desa	329	1/11/1961	2/15/1961	
1	x x	1,2,3		600.61					
12	x x x x x x x x x x x x			560.00					
13		All		640.00					
14	x x			160.00					
36	x x x x x x x x x x x x		See Remarks	600.00	PLO Rev. Rest. Wdl. 50 2/2/1903	3897	1/29/1963	2/6/1963	Other Tps: 2N 1W, 1N 2E, 1N 8E, 2N 8E, 2S 11E, 2S 12E, 1S 13E; Open to entry 7/30/1963 10AM
35			See Remarks		PLO Rod. Wdl. Gila River				W 55', E 55', and S 55' of the SE
					Waterfowl Area Proj. PLO 1015.				
					10/1/1954	3234	7/6/1965	7/20/1965	
35	x x x x x x x x x x x x				R/W Hwy.	AR 033453	8/10/1965		R.S. 2477: Part relinquishment, 7/22/1982
36	x x								
35	x x x x x x x x x x x x		See Remarks		D. Proposed Cl. Multiple Use	A 502	6/5/1967		Public lands segregated from appropriation under agricultural laws, PS, PR, SR, SS, R.S. 2477 and mining laws; Other Tps.: IN 2W, 1S 2W, 1S 3W, 1S 4W, 1S 5W, 2S 5W, 3S 1W, 3S 2W, 3S 3W, 3S 4W, 3S 5W, 3S 6W, 3S 7W, 3S 8W, 3S 9W, 3S 10W, 3S 11W, 4S 11W, 4S 12W, 4S 13W, 4S 12W, 7S 12W, 7S 11W; Pub. P.R. 6/14/1967; D.Cl. 8/31/1967; Pub. P.R.S/14/1967;

Sample Historical Index Page to Lands in the Gila River Area, U.S. Bureau of Land Management

The 1913, 1915, and 1917 historical maps, the U.S. General Land Office original survey plats, and the Bureau of Land Management's Master Title Plats were used to create Exhibits 1-5 in Chapter I. To draw those Exhibits, the river as shown on the historical maps was digitized by Salt River Project Cartographics using a GIS computer system. With this product, Littlefield Historical Research consulted the U.S. Bureau of Land Management's Master Title Plats and Historical Indices to place the federal patents upon the newly created maps. (For Exhibit 1A, which shows State patents, the same process was used with State plats created by the Arizona State Land Department – see later in this Chapter regarding State acquisition and disposition of

federally-granted lands.) Because of the length of the lower Gila River below the Salt River, Exhibits 2-5 show only portions of the stream. However, the patents which appear on these exhibits are representative of settlement patterns throughout the Gila River Basin below the Salt River.

B. 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 the U.S. Congress in the late nineteenth century 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.[48] The application would describe the land by township, range, and section, and within each six-hundred-forty-acre section by a fractional identification. For example, a typical one-hundred-sixty-acre parcel might be described as the northeast quarter of section 21, township 1 north, range 1 west, Gila and Salt River Base and Meridian. A forty-acre parcel might be the northwest quarter of the southeast quarter, and a twenty-acre parcel might be the west half of the southwest quarter of the southwest quarter.

Once the application had been filed, the settler was required to live on the land for a number of years and make various improvements. When the necessary time had elapsed, he or she could return to the land office with witnesses to file affidavits stating that homesteading requirements had been met. There, the settler would also complete any remaining paperwork

---

[48] The most important of these laws was *An Act of Secure Homesteads to Actual Settlers on the Public Domain*, 12 Stat. 392 (1862).

and make final payments. The affidavits and paperwork created a patent file that contained a great deal of information about the settler and the land he or she wanted to acquire.

These patent files are available at the National Archives in Washington, D.C., and those relating to the Gila River were used in the preparation of this report together with the actual patents themselves (obtained from the Bureau of Land Management in Phoenix). The applicant and witness affidavits typically described the parcel in question, the number of acres, the crops farmed, the improvements made, as well as other pertinent information (such as, for example, irrigation canals and diversion points). 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.

In relation to the Gila River, there were many patent applications filed for parcels in sections overlapping the stream between the eastern boundary of township 1 north, range 1 west, and the western boundary of township 8 south, range 22 west – the reach of the Gila involved in this study.

1. Significance of Patents to Gila River's Potential Navigability or Non-Navigability

Federal patents to private parties and the supporting files are important for several reasons in ascertaining the potential navigability of the Gila River around the time of Arizona's statehood. First, the patents indicate the total amount of land awarded by the United States. The acreage is significant because if the Gila River had been considered navigable, federal officials presumably would not have granted title to any land through which the river flowed. Instead, Arizona would have owned such land due to the State's sovereignty. As a result, a patent to a quarter section through which the stream ran would have been recorded as somewhat less than one-hundred-sixty acres (a full section is six-hundred-forty acres). In other words, land would

have been removed from the total acreage because of the stream's navigability. 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 an even division of a six-hundred-forty-acre section. Thus, 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."[49] While there are some government lots lying next to meandered portions of the very lowest reaches of the Gila, those lots were not created due to the stream's navigability. Instead, the lots were formed because of surveying instructions pertaining to meanders of non-navigable bodies of water (see Chapter I above).

Importantly, none of the federal patents that overlay the Gila River (regardless of their respective dates) contain any provisions for reserving the bed of the river to Arizona. There is also no evidence that Arizona, upon statehood, chose lands in lieu of those previously patented upon the river bed – which the State would have been entitled to do had the river been navigable. (In-lieu, or indemnity, selections were public domain lands chosen by a state or railroad to compensate for overlapping claims to state or railroad ownership elsewhere.)

Another reason why patents are important to help determine whether the Gila 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 Gila River or whether he used the river for

---

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

other purposes. Again, nothing in the supporting files suggests that the Gila River was navigable or that settlers used the stream for conveying commerce.

C. FEDERAL PATENTS IN EXHIBIT 2

This report will discuss representative federal patents along the Gila River between township 1 north, range 1 west, downstream to township 8 south, range 22 west, in relation to the Exhibit maps reproduced in Chapter I. While this section of the report does not include every township or every patent within the Gila River watershed to keep the discussion to manageable proportions, all patents in all townships for the watershed have, in fact, been reviewed. None contradicts the evidence presented here, and most of the Gila River patents considered in the following discussion are displayed on Exhibits 1 through 5. For the purposes of this discussion, representative patents and their files will be reviewed going downstream.

1. Federal Patents on the Gila River in Township 1 North, Range 1 West

This township lies directly west of the confluence of the Gila and Salt rivers, and it is the upstream-most segment of the Gila River covered in this study. The land in the area was quite fertile and therefore attracted many early homesteaders, among them Earl A. Watts. Watts applied for a homestead patent on December 17, 1929, for land lying in section 34. A favorable government report written on March 5, 1934, stated that the character of land was "[r]iver bottom alluvial soil seamed and hummocked throughout and covered with a dense growth of brush, and *along the many water courses*, with iron wood." (Emphasis added.) Those water courses included the Gila River. One of Watts' witnesses wrote on his final proof that the land was "[r]olling, *river running through.*" (Emphasis added.) Despite the fact that the river flowed through the land, Watts nonetheless received title to the entire tract, suggesting that the Gila

River was not considered navigable because none of the land was set aside due to the State of Arizona's sovereignty.[50]

Thomas D. Taylor also applied for a homestead patent in section 34 on December 16, 1918. On his final proof, Taylor wrote that only about thirty acres of the claim were capable of being farmed and that the "[b]alance of the land [is] *in the river*." (Emphasis added.) This information was repeated in the witness's affidavits, leaving no doubt that the claim lay in the river bed. Nonetheless, no acreage was reserved for the State of Arizona because of its sovereign rights.[51]

2. Federal Patents on the Gila River in Township 1 North, Range 2 West

Further downstream, the land along the Gila River became more densely settled. On June 11, 1919, Robert O. Gruwell applied for a homestead patent for land lying in sections 25 and 26 of township 1 north, range 2 west. On his final proof, Gruwell reported that only one hundred acres of the claim was cultivable and that the "balance [is] *river bed.*" (Emphasis added.) This information was repeated throughout the patent file, leaving no doubt that part of the parcel was indeed in the river bed. However, no land was reserved for the State of Arizona's sovereign rights to the bed and the banks of navigable streams.[52]

Other patented parcels through which the river flows exist in this township. However, because some of these patents were acquired under the *Desert Land Act* of 1877 and because that law had unique requirements that relate to the issue of navigability, patents acquired under that legislation are discussed separately below.

---

[50] Homestead Entry Patent File for 1070902, 1929, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[51] Homestead Entry Patent File for 762971, 1918, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[52] Homestead Entry Patent File for 814694, 1919, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

3. Federal Patents on the Gila River in Township 1 South, Range 2 West

In 1931 a substantial dispute over land occurred in section 8 of township 1 south, range 2 west. In this township, Walter R. Ford filed a homestead entry for land claimed by another individual. Though a controversy erupted over title to these lands (through which the Gila flowed), the State of Arizona was never a party to the dispute and never filed any protest over the fact that the U.S. was granting title to land that lay in the river bed. On July 25, 1931, the Chief of the field division of the U.S. General Land Office wrote to the Commissioner that "[t]he land involved being located about a mile and one-half south of Liberty, Arisona [sic], is situated, with the exception of the SE1/4NE1/4, *in the bed of the Gila River*." (Emphasis added.) He continued that "[t]he tract in dispute, namely – the SW1/4NW1/4 Sec. 8, with the exception of about ten acres thereof, is strictly speaking bottom land situated *in the bed of the Gila River* and does not show any evidence of having been cultivated within recent years." (Emphasis added.)[53]

Not only did the U.S. General Land Office acknowledge the presence of the river in the disputed parcel, but so too did Walter Ford's proof. It stated that the "surface is practically level except the river bottom. The river bottom is washed . . . 100 acres out of the 160 could be plowed – would be subject, of course, to the overflow of the river when it got up." While the title dispute was eventually settled in favor of Ford, no mention was ever made by the State of Arizona about the lands located in the river bed. Instead, Ford was granted title to the entire parcel, without any lands removed for the State, suggesting that the river was considered non-navigable.[54]

---

[53] Homestead Entry Patent File for 1071855, 1926, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[54] Homestead Entry Patent File for 1071855, 1926, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

D. FEDERAL PATENTS IN EXHIBIT 3

Heading downstream, the next examples of patented land are shown on Exhibit 3, which covers township 4 south, range 4 west, and township 5 south, range 4 west.

1. Federal Patents on the Gila River in Township 4 South, Range 4 West

Nestled against the Painted Rock and Gila Bend mountains to the west, settlers in township 4 south, range 4 west, created one of the few settlements along the lower stretch of this desert river – the farming community of Gila Bend. As part of this community, Miller F. Woods filed a homestead entry for land lying in section 20 on October 7, 1929. On May 15, 1933, a special agent from the Division of Investigations submitted a report of the land in question. This report is in Woods's patent file. The agent wrote that "[t]he Gila River forms the approximate east boundary of the entry, and practically all the land in this entry, with the exception of a narrow strip of higher land along the west line of the entry is *river bottom land*, fairly well covered with a growth of arrow weed." (Emphasis added.) The remainder of the patent file underscores that the land was located in the river bottom, yet no land was reserved for the State of Arizona.[55]

Ben Harrelson came to Gila Bend much later than Woods had. Settling just south of Woods, Harrelson's patent file shows that he did not purchase the land until a public sale around 1952. Furthermore, documentation in the file makes it clear that all parties involved considered the Gila River to be non-navigable. The land classification report filed by Eugene H. Newell for the Bureau of Land Management indicated that of the 160 acres in Harrelson's parcel, "135 acres *lies in the dry Gila River bed* and consists of rocky sand bars which makes the lands totally

---

[55] Homestead Entry Patent File for 1066811, 1929, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

unsuitable for cultivation." (Emphasis added.) The topography, Newell wrote, was "[f]lat along west boundary, dry river bed covers greater portion," and in response to a question regarding the type and extent of erosion, he stated that "*Gila River Bed occupies greater portion.*" (Emphasis added.) Harrelson's own application for the land underscored Newell's report. When asked to describe the character of the parcel, Harrelson said that "small portion on west edge is cultivable – *balance in Gila River channel.*" (Emphasis added.) He also wrote that the "*Gila River flows through* east part during rainy seasons." (Emphasis added.) It was undoubtedly clear to officials that the river flowed directly through and occupied a large percentage of this tract of land. However, no acreage was withheld due to Arizona's sovereign rights to the bed and banks of navigable rivers, nor were any in lieu selections made by the State for these lands.[56]

E. FEDERAL PATENTS IN EXHIBIT 4

Exhibit 4 covers the western edge of township 7 south, range 16 west; township 8 south, range 16 west; township 8 south, range 17 west; and the eastern edge of township 8 south, range 18 west.

1. Federal Patents on the Gila River in Township 8 South, Range 16 West

Further downstream, Chesterton Dennis Norton filed for a homestead patent on December 21, 1928, for land lying in section 9 of township 8 south, range 16 west. It is clear that the Gila River ran very close to or through this land because the patent file contains many references to the river's overflow. For instance, the claimant wrote on his final proof that in 1931, he had "[p]lanted and cultivated 60 acres to barley and wheat – crops being washed away

---

[56] Public Sale Patent File for 1140493, 1952, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

by flood in Gila river," and that in 1932, he had "[p]lanted and cultivated 60 acres to barley and wheat – Gila washing it away." Norton described the same circumstances again for 1933. All of his witnesses testified about the same circumstances. Importantly, none of the land was reserved for Arizona's sovereign rights. Furthermore, the regular flooding of the river, which is noted in this patent file, suggests the river's erratic nature.[57]

There are also Desert Land entries in this township, but they are discussed in the section dealing with the *Desert Land Act* below.

2. Federal Patents on the Gila River in Township 8 South, Range 17 West

Norton Marshall, an immigrant from Canada, set out to homestead land in township 8 south, range 17 west, near Yuma, Arizona, in 1890. His land was quite close to the Gila, however, and according to documents in his patent file, he had to contend with the fickle nature of that river. Specifically, in 1890, Marshall noted in his affidavit that he was absent from his land upon occasion due to "floods in the valley, and he could not return to the land for several weeks, and when the flood subsided the canal was so damaged water could not be gotten [unreadable] to irrigate." This type of erratic behavior suggests that the river was probably not susceptible of navigation.[58]

F. FEDERAL PATENTS IN EXHIBIT 5

Exhibit 5 covers patents located in township 8 south, range 21 west, and township 8 south, range 22 west.

---

[57] Homestead Entry Patent File for 1073385, 1928, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[58] Cash Entry Patent File for 869, 1891, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

1. Federal Patents on the Gila River in Township 8 South, Range 22 West

In spite of the extremely dry nature of the land, homesteaders settled just east of the Gila River's confluence with the Colorado. On April 9, 1903, Clarence Maddox filed a homestead entry on land in sections 29 and 30, township 8 south, range 22 west. Maddox's patent file makes it clear that the Gila River ran through the tract. In a February 26, 1912, letter from a special agent of the General Land Office to the Commissioner, the unnamed author wrote that "[t]he land is agricultural *bottom land of the Gila river and is subject to annual overflows by that river*, and is covered with a growth of arrow weeds and some cottonwood trees." (Emphasis added.) In another letter, written on June 21, 1909, the special agent said that:

> the only time [the Maddox's] were absent from said land up until June, 1908, was at such times as it was unsafe to live thereon by reason of the overflow of the Gila River. . . . Maddox claims that at one time to have had about 40 acres cleared and planted, but that the river washed away all of said cultivation, and that the Gila River has changed its course three or four times during the period he has lived on said land and that at the present time *most of said entry is in the bed of said river*, there being only about 20 acres left; that his other houses were built on the north side of the Gila River, while his present house is on the south side; that the channel of the river has so changed during the past five or six years that while at the time he made his entry all his entry was on the north side of the river that most of it is now on the south side of the river. [Emphasis added.][59]

Another document in Maddox's file, written by his wife on February 21, 1912, stated that:

> the first big flood came about a year after establishing residence. The Gila River overflowed its natural course and washed over our land. . . . We returned to the land about three months subsequent thereto and again lived in the house, until about a year when the Gila & Colorado Rivers again overflowed and drove us from the land, absolutely destroying the adobe house, pumps and all traces of our residence. About six months thereafter we built a small house, and continuously resided therein until a couple of months afterward when the river again rose, washed away our second house, and driving us from the land. . . . I have

---

[59] Homestead Entry Patent File for 1034203, 1903, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

> exercised the utmost good faith in endeavoring to maintain residence on the land during the above period often-times at the risk of my life, and that of my child, the river oftertimes [sic] rising to a depth of seven or eight feet and forming a stream a mile wide in a single night.[60]

When Maddox deserted his wife in July 1909, she became the sole claimant to this parcel, and on her final proof even more information about the land and river became apparent. She wrote that "80 acres of said land practically now *lies in the Gila River Bottom* which at the present time is dry." (Emphasis added.) However, during one of the numerous floods which occurred on this river, Kate Maddox had to be rescued from the land. On a sworn affidavit dated June 24, 1911, she stated that "on one occasion I was held there by the flood and was rescued by Mr. W.E. Lynch, who came in after me with a boat and that the house in which I was then living and its total contents, furniture, clothing provisions and household supplies were washed away and totally destroyed within twenty four hours after Mr. Lynch rescued me."[61]

Kate Maddox was issued a patent to the entire amount of land requested in her application even though the Gila flowed through it. None was reserved for the sovereign rights of the State of Arizona. Furthermore, the vivid descriptions of the violent and erratic river suggest it could not be depended upon for navigation on a regular and reliable basis.[62]

G. THE *DESERT LAND ACT* OF 1877 AND ITS RELEVANCE TO THE GILA RIVER'S NAVIGABILITY

In addition to patented lands already discussed, other parcels along the Gila River were claimed under the *Desert Land Act*. While the various other homestead acts allowed a maximum of 160 acres per individual, the *Desert Land Act* was intended to allow larger blocks to be

---

[60] Homestead Entry Patent File for 1034203, 1903, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[61] Homestead Entry Patent File for 1034203, 1903, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[62] Homestead Entry Patent File for 1034203, 1903, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

settled. Passed by Congress on March 3, 1877, federal lawmakers understood that desert lands were less productive (from an agricultural perspective) than non-arid lands, and therefore, the legislators provided that patents attained under the act could be as large as 640 acres. The relevance of the *Desert Land Act* to the question of the Gila River's navigability lies in the law's requirement that the land be irrigated before the final patent was awarded. Importantly, the water to be used had to be taken from a non-navigable stream. The *Desert Land Act* stated:

> 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.][63]

In short, the *Desert Land Act* stated that land patented under this statute had to be reclaimed through water obtained by prior appropriation from a non-navigable stream. Subsequent court interpretations have confirmed that waters used to "prove up" Desert Land entries had to come from non-navigable streams. For example, in 1935 the U.S. Supreme Court held that any state's right to regulate waters within its borders was subject to the U.S. Government's power "to secure the uninterrupted navigability of all navigable streams within the limits of the United States."[64] The meaning of this statement in relation to the *Desert Land Act* was simply that to deplete waterways by using water for irrigation purposes, those streams had to be non-navigable.

---

[63] *An Act to Provide for the Sale of Desert Lands in Certain States and Territories*, 19 Stat. 377 (1877).

[64] *California Oregon Power Co. v. Beaver Portland Cement Co.*, 295 U.S. 142 (1935) at 159. See also *California v. United States*, 438 U.S. 645 (1978) at 663.

The requirements of the *Desert Land Act* shed light on the non-navigability of the Gila River. There were over twenty patents adjacent to the Gila River awarded under the *Desert Land Act*, many of which cited that stream as their source of water. The logical conclusion from these applications is that the Gila River must have been considered non-navigable by the applicants as well as by the administrators of the U.S. General Land Office.

The following discussion is not limited to desert land entries located in the sample sections although most are, in fact, located there.

1. Desert Land Entries Along the Gila River in Township 1 South, Range 2 West

On August 2, 1886, James H. Brown applied for a claim under the *Desert Land Act* of 1877 in section 4 of township 1 south, range 2 west. Malie Jackson, one of Brown's witnesses, gave a deposition in 1889 in which he asserted that the "Gila River crosses the SE corner of the northwest 1/4 of the SE1/4 but does not once flow the land, the banks of the river are high." The deposition of Brown himself confirmed this same testimony. Additionally, Jackson and Brown both noted that the source for irrigation of the land would be the Gila River through the Buckeye Canal. Brown was awarded patent 1033448.[65]

2. Desert Land Entries Along the Gila River in Township 1 South, Range 3 West

Just downstream, David R. Hefley applied for land lying in section 7 of township 1 south, ranges 2 and 3 west, declaring his intent to reclaim this tract in 1945. He filed his intention to make final proof on the desert land entry in 1951. According to the patent file, the land was clearly crossed by the Gila River on the north side.

---

[65] Desert Land Entry Patent File for 1033448, 1886, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

Hefley's patent file contains a report filed by Field Examiner James W. Neal for the Bureau of Land Management. Describing his findings on October 7, 1946, Neal wrote that "[t]he land lies in the bottoms adjacent to the Gila River, on the south side of the river." Although Neal's characterization was somewhat vague, the land classification filed on June 27, 1946, stated specifically that "[t]he land *is crossed by the Gila River*." (Emphasis added.) On another classification report, submitted on June 11, 1946, for the Department of Interior's Grazing Service, Examiner Morris A. Iragstad recorded that the topography of the land was "*[b]ank and bed of Gila River*, round rocks in sand on flat bottom land." (Emphasis added.) In describing the soil, Iragstad wrote that there was "*[s]and and gravel in bed*; rocky near bank and sandy loam on flat." (Emphasis added.) Perhaps most telling about the documentation in Hefley's file is that, according to Examiner Iragstad, an old channel of the river was also present upon the land that Hefley was attempting to patent: "The non-tillable portion *is part of the present river bed* and the old river bed is composed of bare sandy wash with a predominance of salt cedar and arrowweed *on the old channel portion*." (Emphases added.)[66] All affidavits submitted on behalf of this desert land entry also noted the presence of the river, including that of Hefley himself. Ultimately, no acreage was removed from the final patent – number 1134685 – and no mention was made of Arizona's sovereign right to the bed and banks of the Gila.[67]

The patent file for another settler in this township, Howard William Bourland, also contains documentation which describes in detail the 120 acres of land he wished to patent. The 1953 report that was filed by Appraiser Eugene H. Newell for the Bureau of Land Management clearly stated that "[w]ater for irrigation [for Bourland's land] is obtained from a dug well

---

[66] Desert Land Entry Patent File for 1134685, 1945, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[67] Desert Land Entry Patent File for 1134685, 1945, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

located under the flood-plain bluff of the *Gila River which traverses the southern half of the entry*. . . . Due to the location of the well in the river bed, shallow and an unlimited supply of irrigation water is available." (Emphasis added.) This was the first indication that Bourland's land lay in the river bed. The remainder of the documents in Bourland's file underscores this conclusion. For instance, another report, filed by Field Examiner Paul F. Cutter, stated that "[t]he Gila River (high water) flows westerly through the southeast corner of the land. The East-West flood-plain bluff of the Gila River is situated just north of the center of S1/2NE1/4 section 11 and then drops off to the southwest in SE1/4NW1/4." Lastly, each affidavit submitted on behalf of Bourland's desert land entry noted that the Gila River passed through the land. However, Bourland received patent number 1141999 for all 120 acres, suggesting strongly that contemporaries did not believe the Gila River was navigable.[68]

3. Desert Land Entries Along the Gila River in Township 4 South, Range 4 West

Further downstream, other applicants filed desert land entries along the Gila River. On April 24, 1920, U.L. Logan applied for a desert land patent to 240 acres of land lying in sections 8 and 9 of township 4 south, range 4 west. Logan declared that his irrigation supply would be coming from the Gila Water Company, which obtained water from the Gila River. In addition to the source of water, there were many documents in Logan's file which state that a portion of the claim lay in the river bed. For example, an "Affidavit Outlining Proposed Irrigation Project" stated that "[a]bout 2/3 of the west side of the E1/2 NE1/4 Sec. 8 are non-cultivable, nonreclamable [sic] because the *Gila River often covers this portion which is mostly river sand.*" (Emphasis added.) In May 1924, Logan himself swore to a statement that "20 acres of each of

---

[68] Desert Land Entry Patent File for 1141999, 1953, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

two 40 acre tracts in my said claim, *are in the Gila River*, and not irrigable." (Emphasis added.) This information was repeated on the claimant's final proof as well as those of his witnesses. Moreover, an inspector from the Department of the Interior submitted a report stating that "[o]n the west side [of the parcel] floods in the Gila River have cut away and partly destroyed approximately forty acres." These numerous references to the Gila River upon this tract indicate that all parties were aware of its presence. Nonetheless, when patent 1001597 was awarded to Logan, no acreage was reserved for the State of Arizona's sovereign rights to the bed and banks of navigable streams.[69]

4. Desert Land Entries Along the Gila River in Township 8 South, Range 16 West

On July 13, 1925, James D. Forest filed for a Desert Land entry patent on land lying in section 8 of township 8 south, range 16 west. As noted in a letter contained in Forest's patent file, "[t]he land in question is situated 16 miles northeast of the town of Welton, Arizona and is located on the north side of the Gila River. *This river passes through the extreme southeast portion of this entry in a general northeast and southwest direction.*" (Emphasis added.) The same information was reiterated on Forest's own Final Proof. In response to a question regarding the "streams, springs, or bodies of water" upon the land, Forest wrote that "Gila river is adjoining this land, the stream being dry the greater potion [sic] of the year; stream does not afford natural irrigation." Despite the presence of the Gila, patent 987760 was awarded to Forest without reservation of land for the State of Arizona.[70]

---

[69] Desert Land Entry Patent File for 1001597, 1920, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[70] Desert Land Entry Patent File for 987760, 1925, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

5. Desert Land Entries Along the Gila River in Township 8 South, Range 17 West

In January 1924, William C. Lacy applied for a Desert Land patent on a parcel lying in section 14 of township 8 south, range 17 west. On Lacy's final proof, he noted that "[t]he *Gila River passes along and cuts off about 30 acres on the east end of this entry.*" (Emphasis added.) Lacy's witnesses also testified to this fact. H.S. Price, for instance, wrote to the Commissioner of the General Land Office that "[t]he Gila River is situated about one-eighth of a mile to the east and when the highwaters occur, the entire Sec. 14 is subject to inundation." Importantly, when patent number 1028040 was awarded to Lacy, no land was reserved for the State of Arizona despite the river's obvious presence in the parcel.[71]

Also in section 14 of township 8 south, range 17 west, Allen B. Ming applied for a Desert Land patent in 1924. On May 24, 1927, an inspector from the Department of the Interior submitted a report finding that "[t]his tract is located in the Gila River bottoms, one mile south of Rolls. . . . The *Gila River, dry during the greater part of the year, touches the land* in the southeast corner, but does not naturally irrigate any part." (Emphasis added.) On the claimant's final proof, he repeated that "the *Gila River touches the SE corner of said land*, which stream is dry the greater portion of the year." (Emphasis added.) This same information was repeated on the witnesses' final proofs.[72]

The history of *Desert Land Act* entries along the Gila supports the evidence from homestead and cash entry patents that the river was not considered navigable by contemporaneous observers. No mention was made in the *Desert Land Act* applications of

---

[71] Desert Land Entry Patent File for 1028040, 1924, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

[72] Desert Land Entry Patent File for 1009161, 1924, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.

reserving the bed and the banks of the Gila for Arizona due to the sovereign rights of the State. Moreover, the fact that over twenty Desert Land patents were awarded indicates that many individuals thought the stream not to be navigable. In fact, the evidence indicates that all contemporaneous observers considered the Gila to be non-navigable.

H. FEDERAL LAND GRANTS TO ARIZONA

Arizona, like other public domain states, obtained land by Congressional grants to support 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.[73]

Grants to Arizona covered a variety of purposes. For example, prior to statehood, Congress reserved in 1850 for Arizona and other western territories all the acreage in sections 16 and 36 in each township for the purpose of supporting public schools.[74] In addition, in 1881 Congress granted seventy-two sections (46,080 acres) to be chosen by Arizona in support of universities.[75] Further public domain lands went to Arizona in 1910 under the provisions of the *Enabling Act* for Arizona and New Mexico, which reserved to each territory sections 2 and 32

---

[73] A detailed discussion of lands granted to various states can be found in Jon A. Souder and Sally K. Fairfax, *State Trust Lands; History, Management, & Sustainable Use* (Lawrence: University of Kansas Press, 1996).

[74] *An Act Proposing to the State of Texas the Establishment of Her Northern and Western Boundaries, the Relinquishment by the Said State of All Territory Claimed by Her Exterior to Said Boundaries, and of All Her Claims upon the United States, and To Establish a Territorial Government for New Mexico*, 9 Stat. 446 (1850). This law, most commonly known as the Compromise of 1850 due to its attempt to resolve the slavery issue in the United States in the years before the Civil War, also contained the provision that states carved out of territories gained from Mexico at the end of the Mexican War would each receive sections 16 and 36 to support public schools. See Section 15 of this statute.

[75] *An Act to Grant Lands to Dakota, Montana, Arizona, Idaho, and Wyoming for University Purposes*, 21 Stat. 326 (1881).

(also for schools).[76] Finally, in 1929, Congress provided to Arizona another 50,000 acres from the public domain to fund miners' hospitals.[77]

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), Indian reservations, or other conflicting claims 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 elsewhere equal in size to the total area of the bed of the body of water. Significantly, Arizona made no in-lieu selections to compensate for the area covered by the Gila River's bed in sections 2, 16, 32, and 36 or in other federal lands granted to the State where they overlay the Gila.

I. STATE DISPOSITION OF FEDERALLY-GRANTED LANDS

In the years following statehood in 1912, Arizona's officials confronted the daunting task of disposing of the millions of acres given to the State. To do this, the Arizona State Legislature created an initial version of the Public Land Code in a special 1915 session laying out the manner in which the State would dispose of its public land. The basic procedure established was to advertise the proposed sale of State land for at least ten consecutive 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

---

[76] Section 6, *An Act to Enable the People of New Mexico to Form a Constitution and State Government and Be Admitted into the Union on an Equal Footing with the Original States; and To Enable the People of Arizona to Form a Constitution and State Government and Be Admitted to the Union on an Equal Footing with the Original States*, 36 Stat. 557 (1910).

[77] *An Act Making an Additional Grant of Lands for Miners' Hospitals for Disabled Miners in the States of Utah and Arizona, and for Other Purposes*, 45 Stat. 1252 (1929).

purchase, indicating his or her promise to pay any balance in addition to State taxes. Once full payment had been received, an Arizona State patent was issued.

This section of the report demonstrates that Arizona officials did not consider the Gila River to be navigable when granting title to parcels through which the stream flowed. The discussion centers around the land in township 1 north, range 1 west. (For the location of State patents discussed here, see Exhibit 1A, reproduced below.) Information about State patents is derived from the State patents themselves and related State patent files at the Arizona State Land Department. The location of State patents was determined in part through the use plats generated by the State of Arizona, a sample of which is also reproduced below. Although this report only discusses in detail the State patents in this one township, all State patents overlaying the river were reviewed for the purposes of this report. None contain any information which disputes the conclusions set forth below.

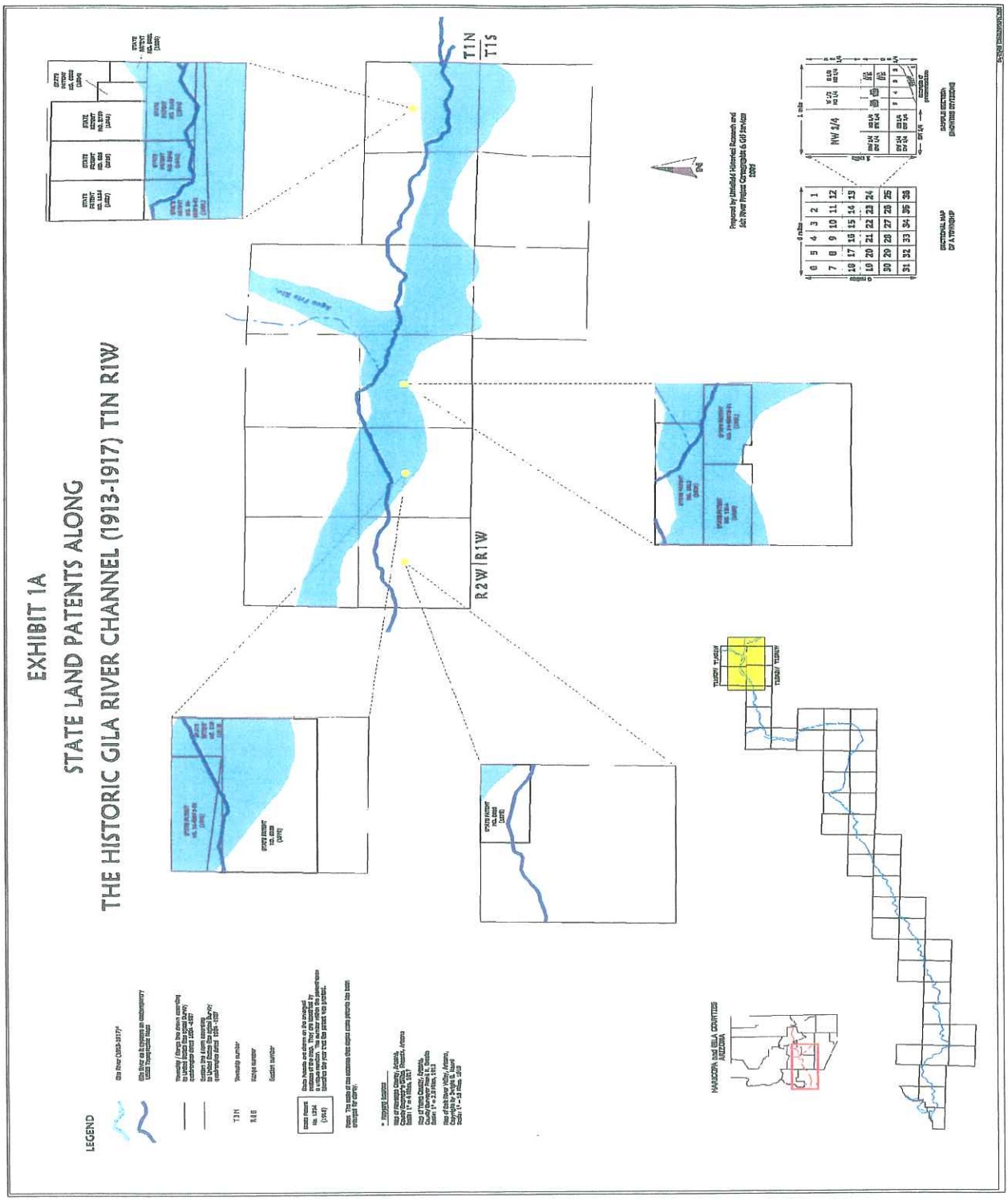
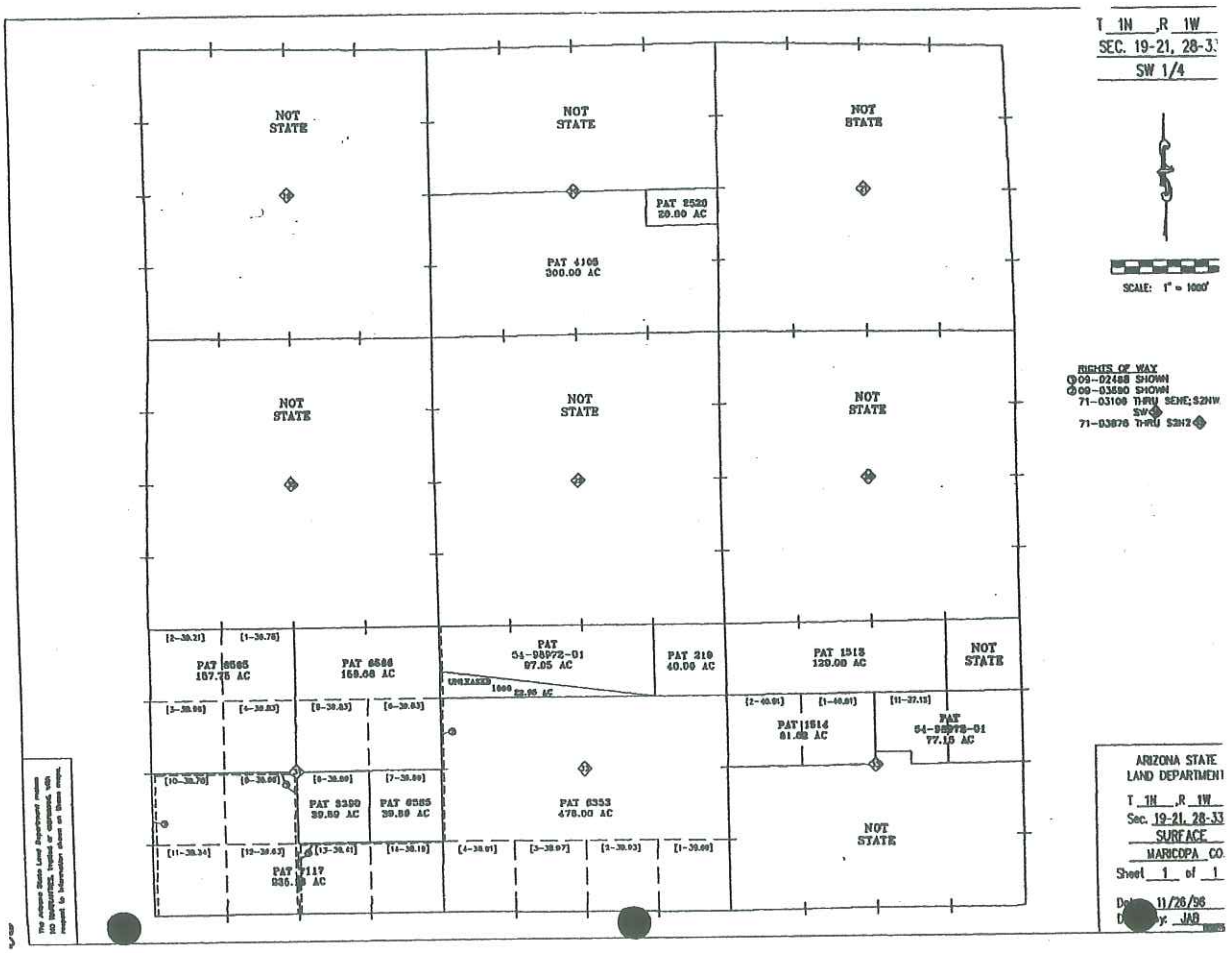


Exhibit 1A, State Land Patents Along the Historic Gila River Channel (1913-1917) T1N R1W, Littlefield Historical Research and Salt River Cartographics & GIS Services, 2005



Sample Master Title Plat to Arizona State Lands in the Gila River Area, Arizona State Land Department, Phoenix, Arizona

1. State Patents in Township 1 North, Range 1 West

The land lying directly west of the confluence of the Gila and Salt rivers drew many settlers. Those unable to homestead on land obtained directly from the federal government had the option of purchasing land from the State of Arizona, which owned at least four sections of land in this township. Importantly, the Gila River ran through two of the four, sections 32 and 36. In addition, Arizona obtained land in sections 31 and 33 of the same township in lieu of

lands located elsewhere in the State. The land in all of these sections – 31, 32, 33, and 36 – was eventually sold by the State to individuals.

In section 36, Arizona sold seventy-nine acres of the northwest quarter in the form of patent number 986 to Bruno Ramirez on August 18, 1926. The river bordered the southern edge of Ramirez's land, yet no land was reserved for the State. The acreage directly to the west of Ramirez's land, also in the northwest quarter, was sold to L.J. Holzwarth just one year later, on September 16, 1927. As on Ramirez's land, the Gila River ran along the south edge of this parcel, but no acreage was withheld. The same was true for the land to the east of Ramirez's, patent 2739 lying in the northeast quarter of section 36. Here, the land was patented to L.W. and Irma J. Hudson on May 1, 1943. No mention was made in any of these three patents about the sovereign rights of Arizona to the land overlying navigable streams.[78]

In the south half of the section, the State of Arizona sold forty acres to Elgie L. Burleson on March 11, 1944, without any mention of reserving the river's bed in the interest of the State. The land directly to the east of Burleson's parcel was also patented without mention of the State's rights. Lloyd C. Lakin and George T. Peter, co-partners in the Lakin-Peter Cattle Company, purchased eighty acres of land in the southeast quarter of section 36 on November 30, 1944. Their patent, number 3166, mentioned nothing about the bed of the Gila River. The other two patents in the section, 6980 and 6981, both sold in 1984, also gave no indication of Arizona's interest in the bed of the Gila River.[79]

Downstream in section 33, patent 1514, sold to the Chula Vista Ranch Company on November 20, 1929, had the Gila River coursing directly through it. Yet 81.62 acres were sold

---

[78] State Patent 986, 1926; State Patent 1124, 1927; State Patent 2739, 1943, Arizona State Lands Department, Phoenix, Arizona.

[79] State Patent 2946, 1944; State Patent 3166, 1944; State Patent 6980, 1984; State Patent 6981, 1984, Arizona State Lands Department, Phoenix, Arizona.

without reserving any of the river's bed to the State of Arizona. The same company also patented the land directly to the north on the same day. This patent, number 1513, totaled 120 acres, again with no reservation for the bed of the river. Patent 54-98972-01, also in section 33, also did not reserve any land for the State.[80]

State patents in section 32 support the conclusion that the Gila River was not considered navigable. Lying in the northeast quarter of the northeast quarter, patent 219 was sold to the Buckeye Irrigation Company on September 24, 1918. The appraisers' report stated that "the intake and sand gates of the Buckeye Irrigation Co's canal lie upon this tract." The application to purchase State lands contained a comment that the "grazing land is in river bottom," and that "*Gila River flows over south part of forty.*" (Emphasis added.) These comments make it clear that the Gila River ran through this parcel of land. Nonetheless, the State did not reserve any of the acreage for its sovereign rights, patenting the entire forty acre tract to the company. Patent 6353, south of the Buckeye Irrigation Company's land, also did not have any of its acreage reserved for the State's sovereign rights.[81]

Lastly, the sole patent overlying the river in section 31 was granted by Arizona to James L. King on March 30, 1978. King received 159.66 acres lying in the north half of the northeast quarter. The Gila River flowed directly through this parcel of land, yet none of its acreage was reserved for the sovereign rights of the State of Arizona.[82]

---

[80] State Patent 1514, 1929; State Patent 1513, 1929; State Patent 54-98972-01, 1991, Arizona State Lands Department, Phoenix, Arizona.

[81] State Patent 219, 1918; State Patent 6353, 1976, Arizona State Lands Department, Phoenix, Arizona.

[82] State Patent 6566, 1978, Arizona State Lands Department, Phoenix, Arizona.

J. CONCLUSIONS REGARDING FEDERAL LAND PATENTS TO PRIVATE PARTIES, GRANTS TO THE STATE OF ARIZONA, AND STATE PATENTS

In conclusion, the federal government granted over ninety-five separate patents that touched or overlay the Gila 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 Gila by the State of Arizona. In each case where patents were applied for, several parties expressed implicit opinions on the navigability of the Gila 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 Gila River's navigability in this manner – opinions spread chronologically over many years, throughout different seasons, and over a large geographic area.

The patents issued by the State to private parties for land through which the river ran provided another perspective. If the State had believed it owned the bed and banks of the river, it presumably would have considered the stream's navigability in disposing of those lands. Yet there are over sixty instances in which the State chose to sell lands which lay in the river bed. Collectively, therefore, federal patents, Congressional grants to Arizona, and State patents strongly suggest that both federal and State officials did not perceive the Gila River to be navigable.

CHAPTER III: 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 Gila River prior to and in 1912, other U.S. Government records – both published and unpublished – provide a wealth of supplemental information concerning that stream. In addition to information from the from the U.S. General Land Office (which directed federal surveys and patenting), two of the most important U.S. Government agencies concerned with the region were the U.S. Geological Survey and the U.S. Reclamation Service (today, the Bureau of Reclamation). 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 Gila River before and at the time of Arizona statehood.

Because of the importance of the records of the Geological Survey and the Reclamation Service, the documents those agencies created will be discussed in detail in this report. There were, however, other federal agencies whose responsibilities brought them into contact with the Gila River. Because those agencies' characterizations of the Gila River essentially duplicated those of the Geological Survey and the Reclamation Service, only the latter two agencies' papers will be reviewed here in depth to avoid needless repetition. The discussion will cover representative examples from thousands of pages of documents that were examined for this report, all of which substantiate that the Gila River was never viewed as a reliable means of navigation prior to or at the time of Arizona statehood in 1912.

One additional U.S. Government report not contained in the records of the Geological Survey or the Reclamation Service will also be discussed here. That report was done in

conjunction with the University of Arizona's Agricultural Experiment Station, and it contains a wealth of information about the Gila River.

A. RECORDS OF THE U.S. GEOLOGICAL SURVEY

The U.S. Geological Survey and its predecessor agencies started recording commentary concerning the West's resources as early as the 1870s, and the Geological Survey's records about the Gila contain a wealth of information on the stream.

1. The Wheeler Survey

For example, in 1872 the U.S. Government sent George M. Wheeler to obtain topographical information about Arizona and Nevada and to assess the region's resources, climate, and other qualities that might affect homesteaders. (Although this study of the West was conducted under the direction of the U.S. Army prior to the creation of the U.S. Geological Survey in 1879, Wheeler's records are considered part of the those of the Geological Survey's predecessor agencies.)

Following his exploration of the region, Wheeler submitted a report to Congress containing a daily record of the journey as well as descriptions of various subjects. In the report, Wheeler mentioned several streams in Arizona, including the Gila, the Salt, and the Verde. None of these, however, were described as being navigable, although navigability was certainly a characteristic Wheeler would have discussed given his detailed characterization of the Colorado River. Under a section entitled "Means of Communication," Wheeler noted that boats had gone upriver on the Colorado as high as Camp Mohave (upstream from Yuma, Arizona, near present-

day Bullhead City).[83] Yet Wheeler was pessimistic about reliable river transport anywhere in the West, even on the Colorado:

> 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.[84]

2. U.S. Geological Survey *Annual Reports*

Following the Wheeler Survey, the Geological Survey became more directly involved in examining water resources in the West. In 1888 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. Many of the descriptions of the streams of the West were included in the Geological Survey's *Annual Reports*.

Part II of the Eleventh Annual Report of the U.S. Geological Survey, for example, contained a section devoted solely to the Gila Basin. In describing the basin in general, this 1891 report stated:

> 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

---

[83] Camp Mohave (also called Camp Colorado and Fort Mohave) was established by the U.S. Army in 1859 at Beale's Crossing on the Colorado River. It was closed in 1935.

[84] George M. Wheeler, *Report on Exploration of the Public Domain in Nevada and Arizona*, H. Ex. Doc. 65, 42nd Cong., 2 sess. (Washington, D.C.: U.S. Government Printing Office, 1872), pp. 17-19, 53.

> 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.[85]

The Twelfth Annual Report of the U.S. Geological Survey contained more description of the Gila. Noting that for farming purposes "water is derived from the Gila River and its tributaries by means of canals and ditches, which distribute it to the fields of each farmer," the report added that "[t]hese streams fluctuate greatly, being at times 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."[86] The *Twelfth Annual Report of the U.S. Geological Survey* also described massive torrents and dramatic changes in flow on the Gila:

> The floods of the Gila are usually short and violent, the highest water occurring during the months of January and February. During a freshet the river rises in some places from 8 to 12 feet, and increases in width from 300 feet to a mile and a half. It is sometimes impassable for weeks, and has the appearance in places of a sea of muddy water. The season of low water occurs during the months of June and July, the river bed being then dry in places.[87]

3. 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

---

[85] *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.

[86] *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), p. 292.

[87] *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), p. 295.

topics and geographic areas, some examined subjects which shed light on the nature of the Gila River prior to or at the time of Arizona's statehood. The Water Supply Papers further confirm the undependable and unpredictable nature of the stream.

For example, *Report of Progress of Stream Measurements for the Calendar Year 1905, Part XI. Colorado River Drainage Above Yuma* (U.S. Geological Survey Water Supply Paper No. 175) noted that:

> [t]he river now (1905) flows in a channel fully 1 mile north of the original channel. . . . At every flood the channel shifts. The valley at its narrowest is half a mile wide and the waters may occupy any part or all of it. . . . [The river contains] an enormous amount of mud and sand. At times the waves of sand traveling along the bed of the stream are so large, the current is so swift, and the stream so shallow, that the water is broken into a uniform succession of waves 2 feet high and over.

A table accompanied this description recording discharge at Gila City (Dome), Arizona, and it further indicated the erratic nature of this river. For instance, on February 8, 1905, the discharge was 82,000 cubic feet per second, but just eight days later, on February 16, no discharge was recorded at all.[88]

U.S. Geological Survey Water Supply Paper No. 162, published in 1906, added additional detail about the Gila's characteristics. Entitled *Destructive Floods in the United States in 1905, with a Discussion of Flood Discharge and Frequency and an Index to Flood Literature*, this Water Supply Paper described the devastating floods which occurred in the United States in 1905, including five on the Gila. Observing that the first 1905 Gila inundation was "more characteristic of floods on this stream than any of the others," the Water Supply Paper stated that

---

[88] M.C. Hinderlider and G.L. Swendsen, *Report of Progress of Stream Measurements for the Calendar Year 1905, Part XI. Colorado River Drainage Above Yuma*, U.S. Geological Survey Water Supply Paper No. 175 (Washington D.C.: U.S. Government Printing Office, 1906), p. 164.

such torrents were "generally of short duration, the rise and fall being very rapid."[89] More telling, however, was the Water Supply Paper's attempt to put the spring floods into proper perspective:

> The total run-off for the five months is 2,957,400 acre-feet. To appreciate the magnitude of the run-off on this stream during this period it is necessary to remember that this stream is usually dry at this place about ten months of the year. . . . [The Gila's bed] not only scours out during a flood and fills in after it, but [the] channel changes from one side of the bottom to the other. . . . This continual changing of the river bed has made it exceedingly difficult to secure reliable estimates of the rate of flow, and some of the estimates may be largely in error.[90]

U.S. Geological Water Supply Paper No. 289, written about the surface water supply of the United States in 1910, provided additional useful information on the character of the Gila. Calling the river "torrential," the report described the Gila as "sometimes impassable for weeks and [it] has the appearance of a sea of muddy water." The Water Supply Paper added that the "season of low water occurs in June and July, the river bed then being dry in places."[91]

The Gila River's dramatic fluctuation in flow can probably best be seen in U.S. Geological Survey Water Supply Paper No. 1049, which provided a summary of records of the surface waters of the lower Colorado River Basin between 1888-1938. These included records for the gauging station located near Dome, Arizona (also known as Gila City), close to the mouth of the Gila River. Records at this station were available from 1902 to 1938, and they consistently illustrated that the Gila ranged in discharge from nothing to well over 100,000 cubic

---

[89] Edward Charles Murphy, et al., *Destructive Floods in the United States in 1905, with a Discussion of Flood Discharge and Frequency and an Index to Flood Literature*, U.S. Geological Survey Water Supply Paper No. 162 (Washington, D.C.: U.S. Government Printing Office, 1906), p. 47.

[90] Edward Charles Murphy, et al., *Destructive Floods in the United States in 1905, with a Discussion of Flood Discharge and Frequency and an Index to Flood Literature*, U.S. Geological Survey Water Supply Paper No. 162 (Washington, D.C.: U.S. Government Printing Office, 1906), p. 48.

[91] W.B. Freeman, et al., *Surface Water Supply of the U.S.-Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 289 (Washington D.C.: U.S. Government Printing Office, 1912), p. 200.

feet per second in many cases. Moreover, at the mouth of the Gila, there was no flow at all in February 1912, and none appeared until the following May.[92]

4. Unpublished Records of the U.S. Geological Survey

Aside from the published reports and Water Supply Papers created by the Geological Survey, the agency also generated other documents shedding light on the nature of the Gila River prior to and about the time of Arizona's statehood.

The unpublished records of George M. Wheeler that led to his published report to Congress in 1872 (see above) provide yet more information about the nature of the Gila River. Wheeler's draft "Progress Report Upon Geographical and Geological Explorations and Surveys West of the 100th Meridian in 1872" observed that:

> [t]here are three streams whose navigability gives them more or less importance as commercial lines, namely: the Columbia, the Sacramento, and the Colorado rivers. [Wheeler had reduced the number of navigable streams to two in his final report to Congress – see above.] The limit of navigation of these streams for freight carrying vessels, has already been determined and from it, is deduced the conclusive fact that except for their advantages as an assistance to local interior traffic, and as the possible adjunct to trans-continental routes, that the standard for their usefulness has been fixed: which usefulness is governed by the rates of increase of commerce from the ports at their mouths to and from the head of navigation in each case.[93]

Later unpublished records of the U.S. Geological Survey confirmed the inability of the Gila to support commercial navigation. For example, one such document summarized the numerous conflicts in the Gila Valley regarding right-of-ways for canal companies. Writing on February 14, 1911, the Director of the Geological Survey reported upon the application of the

---

[92] *Summary of Records of Surface Waters at Stations on Tributaries in Lower Colorado River Basin, 1888-1938*, U.S. Geological Survey Water Supply Paper No. 1049 (Washington D.C.: U.S. Government Printing Office, 1947), pp. 230-237.

[93] George M. Wheeler, "Progress Report upon Geographical and Geological Explorations and Surveys West of the 100th Meridian in 1872," p. 256, box 1, Entry 20, Records of the U.S. Geological Survey, Record Group 57, U.S. National Archives II, College Park, Maryland.

Southwestern Arizona Fruit and Irrigation Company to take a canal out of the Gila. Referring to an unspecified survey made the previous year and subsequent report in relation to another canal company, the Director observed that:

> [t]he same conditions exist regarding the Southwestern Arizona Irrigation Company's project, and in brief are that no power possibilities exist, but the sufficiency of the water supply is extremely questionable. On account of the appropriations above, the only water available at this site is that of occasional extreme floods, and the underflow and seepage water from upstream, the amount of which is very uncertain. The proposed reservoir is of such small capacity as to have little value for storing flood waters.[94]

One particularly revealing unpublished report prepared for the Geological Survey that sheds light on the nature of the Gila dealt with potential hydroelectric power sites within Arizona. Although written shortly after Arizona became a state, the report was based on data accumulated for many years prior to statehood, and it had been done to conform with provisions of the 1910 *Enabling Act* allowing Arizona to take steps to join the Union. That law, however, also prevented the future state from selecting parcels valuable as hydroelectric power sites as part of acreage granted to Arizona by Congress. The resulting report by E.C. Murphy was the result of an investigation to locate those hydroelectric power sites so the United States could retain them.[95]

Part 2 of Murphy's report dealt with the Gila River. The introduction to this section described the Gila's general characteristics, noting that it was a tributary of the Colorado. Adding that the Gila drained about 70,000 square miles in Arizona, New Mexico, and Mexico,

---

[94] Department of the Interior, General Land Office, Affirming R & R Decision, Feb. 24, 1912, "37-A-5 Straights, Preliminary Investigations-Sentinel Project 37-A-5," General Correspondence File (Straights) #37-A, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

[95] 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.

Murphy nevertheless observed that the Gila had "a very small run-off at the mouth except during very wet periods."[96] Murphy then described the Gila:

> On account of the erratic character of the precipitation, the use of the water for irrigation, and the depth and porosity of the valley fill the minimum flow in the valleys along the Gila is very small and uncertain. In all these valleys there is no surface flow at certain places during the low water period of dry years. Though the surface flow may be 0 at one place there may be several second feet at some distance below due to seepage from irrigated lands, or a reduction in cross section of the ground water channel.[97]

Regarding the Gila's water supply, Murphy added further detail about the nature of that stream, explaining that the river was:

> partly an under ground stream rising and sinking according to local formations. There is abundant evidence of this fact from Clifton, New Mexico, to Gila Bend, Arizona. In each of the valleys between those places the Gila is dry for a few days nearly every year and at a point a few miles below there is flowing water in the stream. . . . In 1903 there was a flood on the San Francisco that reached a stage of 30 feet above low water at Clifton. By the time this flood reached the mouth of Salt River, 175 miles distant, it had almost entirely disappeared. With the exception of a small part that passed into irrigation ditches and some that passed off in evaporation, this flood went into the ground storage.[98]

Indicating that the Gila was not relied upon for commercial transportation, Murphy stated that one of the major hindrances to reservoirs on the Gila was "a railway running along the river through some of the sites that must be moved to higher location."[99]

In his discussion of hydroelectric power possibilities along the Gila, Murphy said that for the segment of the river from its mouth to Buttes, the

> stream flows through a broad, flat valley in a broad, sandy, changing channel. It is dry for a month or longer each year at Florence, and below Gila Bend it is dry

---

[96] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Part II, p. 1, Salt River Project Archives, Phoenix, Arizona.

[97] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Part II, p. 3, Salt River Project Archives, Phoenix, Arizona.

[98] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Part II, p. 8, Salt River Project Archives, Phoenix, Arizona.

[99] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Part II, p. 8, Salt River Project Archives, Phoenix, Arizona.

all the time except during large and long continued floods. There are many ditches diverting water from the Gila in this part, and the area that can be irrigated from them is very large, but the area actually irrigated is comparatively small on account of small and uncertain supply. As previously stated there may be several years in succession of very small run-off. During these years only ground water is available for some of this land. The irrigation ditches and especially the head works are allowed to get out of repair and when a flood comes it damages or destroys the head works and little if any of the flood water is utilized. . . . At some places on the Gila Indian Reservation the underflow comes to the surface and is diverted for irrigation, also below the mouth of Salt River where the Buckeye and Arlington canals are located. The canals and ditches that tap the underflow have a permanent supply but those that depend on the surface flow for water are not a success.[100]

B. 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 *Reclamation Act*, 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 investigated the Gila River for possible reservoir sites.

1. U.S. Reclamation Service *Annual Reports*

Like the Geological Survey, the Reclamation Service issued *Annual Reports* delineating its activities, and these contain valuable descriptions of the Gila River. Much of the Reclamation Service's focus was on the San Carlos Reservoir site above the Gila's confluence with the Salt River, but nevertheless, the agency also dealt with the Gila below the Salt.

---

[100] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Part II, pp. 9-10, Salt River Project Archives, Phoenix, Arizona.

The *First Annual Report of the Reclamation Service* commented 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 lands. Nonetheless, the *Report* stated 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."[101] In addition, the *Report* added:

> The 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.[102]

The *Ninth Annual Report of the Reclamation Service* carried information about progress being made on a canal to serve the Gila River Indian Reservation. Yet the *Report* also indicated that the erratic nature of the Gila made that work difficult:

> [T]he construction of the flood-water canal on the Gila River Indian Reservation was begun, 6 miles of canal being excavated, and most of the concrete structures were built. Work was suspended in April, 1910, and will be resumed after the flood season in the Gila River.[103]

2. 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 Gila River as highly unpredictable and not useful for commercial navigation. While these files contain many documents describing the Gila River and proposals

---

[101] *First Annual Report of the Reclamation Service, from June 17 to December 1, 1902* (Washington D.C.: U.S. Government Printing Office, 1903), p. 75.

[102] *First Annual Report of the Reclamation Service, from June 17 to December 1, 1902* (Washington D.C.: U.S. Government Printing Office, 1903), p. 76.

[103] *Ninth Annual Report of the Reclamation Service, 1909-1910* (Washington D.C.: U.S. Government Printing Office, 1911), p. 68.

for dams on that stream – none of which indicate that the river was a reliable means of navigation – representative examples are provided here.

One such document is a 1911 letter from L.W. Powell to Secretary of the Interior Walter L. Fisher regarding the possible construction of a dam by the Gila Water Company. In this letter, Powell wrote that "[t]he flow of the Gila varying as it does from almost nothing at times to a tremendous volume during floods, makes necessary very accurate data to enable us to decide upon the type and construction of the dam contemplated." Powell asked that the Secretary of the Interior direct the Reclamation Service to undertake a hydrographic study of the Gila to assist the dam construction plan.[104]

Correspondence regarding a proposal for a dam at Gila Bend also provided information on the characteristics of the Gila River. Although the following two letters were written in 1913, they both indicate that the descriptions of the Gila were historical in character. The first letter from Reclamation Service Division Engineer Louis C. Hill to Howard S. Reed (another Reclamation Service employee) expressed Hill's disbelief about what he thought had been Reed's comment to another party that the Gila had a minimum flow of 125 cubic feet per second all year. Hill stated:

> I feel quite sure that he must be entirely mistaken in this, because we both know that there are certain seasons of the year that you certainly cannot get 125 second feet; in fact, the only time that I went down there, which was with you I believe, there wasn't over about 125 inches and all of that was going into a little ditch on the north side of the river.[105]

---

[104] L.W. Powell to Walter L. Fisher, July 19, 1911, 37-A-5 Straights, Preliminary Investigations-Sentinel Project, 37-A-5, General Correspondence File (Straights) #37-A, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

[105] Louis Hill to H.S. Reed, June 3, 1913, 37-A-5 Straights, Preliminary Investigations-Sentinel Project 37-A-5, General Correspondence File (Straights) #37-A, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

Reed responded to Hill's letter on June 10, 1913. In reference to the amount of water which could be expected to flow in the Gila, Reed wrote:

> I am inclined to think the expression that I used was that, "During my various visits to the Gila Dam site, never have I seen less than 100 second feet surface flow, with the river dry between that site and the Buckeye Dam and that canal full to its capacity." . . . [O]n the 10th of August, 1911, I made a current meter measurement, the original notes which are herewith enclosed, when I found a discharge of 103 cubic feet per second and this with no flow at all below the Buckeye Dam. In fact, one could walk across the river and hardly dampen the shoes.[106]

C. UNIVERSITY OF ARIZONA AGRICULTURAL EXPERIMENT STATION'S 1911 REPORT

Although the largest amount of information about the Gila River in federal files is in the records of the Geological Survey and the Reclamation Service, one especially useful report on the nature of that stream is contained in Department of Agriculture records. That report is *Irrigation and Agricultural Practice In Arizona* by R.H. Forbes. Published by the U.S. Government Printing Office in 1911, the report had been the fruit of research undertaken at the University of Arizona's Agricultural Experiment Station, which was overseen by the U.S. Department of Agriculture. The report was a detailed discussion of Arizona's principal industries, transportation, climate, water supply, and farmlands.

In his report, Forbes first discussed the territory's principal industries and then turned his attention to transportation. Because of the significance of what Forbes wrote in relation to the Gila River, it is worth quoting this part of his report at length:

> By reason of its isolation, Arizona is dependent upon its transportation facilities to an unusual degree. These consist chiefly of three great railroad systems, which, in

---

[106] Howard S. Reed to Louis C. Hill, June 10, 1913, 37-A-5 Straights, Preliminary Investigations-Sentinel Project 37-A-5, General Correspondence File (Straights) #37-A, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

> order of their construction, are the Southern Pacific, the Santa Fe, and the El Paso & Southwestern. The Santa Fe crosses the northern tier of counties from east to west, and with its branches opens up the mining and lumbering districts of the more elevated half of the Territory. The Southern Pacific runs a roughly parallel course south of the Gila River, and its feeders tap the rich mining districts and the warmer irrigated valleys at lower altitudes. The El Paso & Southwestern road affords an outlet for the copper mines of southeastern Arizona and northern Mexico. A few steamboats of shallow draft ply the Colorado River, and in remote localities freighting with teams is still practiced.[107]

It is significant that Forbes only listed the Colorado River as having regular navigation. Moreover, his statement that the Southern Pacific Railroad ran south of the Gila River additionally indicates that Forbes did not think the Gila was navigable.

In relation to surface streams and water supply, Forbes initially discussed the Colorado, and then turned his attention to the Gila. Forbes wrote that the Gila was:

> a comparatively small and irregular stream, due to its arid watershed and uncertain rainfall, although occasionally it carries enormous floods. Since the appropriation of its upstream waters for irrigation its lower courses are often dry for months in succession. . . . The run-off of the Gila is difficult to estimate, differing in this respect from the Salt and Colorado Rivers, which, confined in rocky beds in their upper courses, can be quite definitely and completely measured at established gauging stations. The Gila, flowing in a pervious bed of low gradient, is in varying proportions an underground river, and rising and sinking as it does, according to local formations, can not be measured definitely by ordinary methods. The amount of surface flow, as estimated from the not very continuous or prolonged measurements available, indicates a limited but comparatively constant stream in the upper Gila near the New Mexico line, but an increasingly variable and inconstant irrigating supply between San Carlos and Yuma. The San Pedro and the Santa Cruz Rivers resemble the Gila and give tribute to it mainly in flood waters. The seepage from the Salt River irrigation appears near its confluence with the Gila and affords a very constant and reliable supply for the irrigation of the lands near Buckeye and Arlington. Below the latter point *the Gila supply is so uncertain* as to preclude satisfactory farming operations. . . . The *Gila River is not infrequently dry at Florence*, sometimes for several months at a time, as for instance, from March to July, 1899. Without storage, therefore, agriculture at this point is less assured of its necessary irrigating supply than near the New Mexico boundary, where even in driest years, the river has never failed entirely.

---

[107] R.H. Forbes, *Irrigation and Agricultural Practice In Arizona*, University of Arizona Agricultural Experiment Station (Washington D.C.: U.S. Government Printing Office, 1911), p. 14.

> *At Yuma the Gila is even more variable than at Florence*, and the discharge has ranged, it is said, from nothing for a period of a year to as high as 3,665,148 acre-feet in 1905. . . . It may be stated summarily that the fluctuations in water supply become more and more extreme from the source to the mouth of the Gila. [Emphases added.][108]

D. SUMMARY AND CONCLUSIONS REGARDING U.S. GOVERNMENT REPORTS AND OTHER DOCUMENTS

U.S. Government records – both published and unpublished – clearly indicate that the Gila River between its confluence with the Salt River and its mouth at the Colorado River was not navigable or susceptible of navigation at or before Arizona's statehood on February 14, 1912. The records of the federal agencies whose responsibilities were most closely associated with water resource development in the West (the Reclamation Service and the Geological Survey) consistently portrayed the Gila River as highly erratic with unpredictable flows and a shifting channel. This assessment was further confirmed by the 1911 report done for the University of Arizona Agricultural Experiment Station by R.H. Forbes. Such a stream could hardly provide a reliable means of water-borne commerce.

---

[108] R.H. Forbes, *Irrigation and Agricultural Practice In Arizona*, University of Arizona Agricultural Experiment Station (Washington D.C.: U.S. Government Printing Office, 1911), pp. 32, 46-48.

CHAPTER IV: MISCELLANEOUS DOCUMENTS AND PHOTOGRAPHS

The following miscellaneous documents, press accounts, and historical photographs – gathered from many sources – reinforce the evidence found in federal surveys, federal and state patents, and other government documents indicating the lack of navigability of the Gila River.

A. MISCELLANEOUS HISTORICAL DOCUMENTS

Included in this discussion are textual records such as the records of explorers, legislative pronouncements, the observations of irrigation enthusiasts, statements by local residents, press accounts, and historical photographs. This material, which ranges chronologically from 1775 to 1941, supports the findings in other parts of this report that the Gila River was erratic, unreliable, and blocked by obstructions such as sand bars, gravel beds, boulders, and diversion dams. These documents and photographs are representative of many more illustrating the same conclusions regarding the Gila.

1. Spanish Missionaries

There are numerous accounts of the Gila River as it existed prior to Arizona statehood in 1912. Among them are reports of Spanish missionaries, military explorers, and various other visitors to the region. One of the earliest non-Indians to visit the Gila River area was Francisco Garces, a Spanish missionary priest, who traveled through what is now the American Southwest in 1775 and 1776. While in what is today the State of Arizona, Garces described the frequent shifting of the Gila's channel on November 29, 1775, as part of his commentary on that stream and on the Colorado River:

> As the rio Colorado has such a current, and runs so scattered through the bottomlands, we found no Isla de Trinidad, neither was there now the ford by

> which passed the expedition on the former occasion, the Indians saying that the river was now very deep at that ford: for these two rivers Colorado and Gila rise every year to such excess, and run through these flat and friable grounds with such lack of restraint, that they appear to shift their channels, forming wash-outs, and dividing into branches, according as the force of the current bears more or less to this side or to that. The result is, that at its greatest flood the Gila itself extends more than a league, and presumably the Colorado much more.[109]

2. American Military Expeditions and the U.S.-Mexican Boundary Survey

Many early explorers of the Gila River region were members of the American military. This is partly due to the fact that the Gila and the Colorado River provided an access route across the Southwest that was useful during the war between Mexico and the United States (1846-1848). Other military explorers came after the war, both to document the assets of the region after the United States had acquired it as well as to survey the new border between the United States and Mexico (a part of which was the Gila River until the Gadsden Purchase of 1853). The importance of the Gila as a way across the Southwest has been noted in Odie B. Faulk's *Destiny Road; The Gila Trail and the Opening of the Southwest* (1973), although in Faulk's opinion, the river itself was not useful for transportation:

> That the Gila Trail should be of such importance was incomprehensible to men in the eastern United States during the 1850s, for there rivers had provided the natural highways for pioneering; these in turn had carried canoes, flatboats, keelboats, and steamboats, and along their banks men had planted their farms and built their cities. *In the arid reaches of the American Southwest, however, no such water route was available, and a road, such as the Gila Trail, became the route of exploration, conquest, transportation, and communication.* [Emphasis added.][110]

---

[109] Francisco Garces, *On the Trail of a Spanish Pioneer: The Diary and Itinerary of Francisco Garces*, Elliot Coues, trans. (New York: Francis P. Harper, 1900), p. 145. Depending on the time and country, a league varied in distance from about 2.4 to 4.6 statute miles. The Spanish league, which was used in what is today the American West, was 2.63 miles.

[110] Odie B. Faulk, *Destiny Road; the Gila Trail and the Opening of the Southwest* (New York: Oxford University Press, 1973), p. viii.

Despite Faulk's assessment that transportation went by land and not by water in the Gila River region, there were at least a few attempts to use boats on the Gila, particularly during the war between Mexico and the United States. Among the earliest military groups to attempt using the river for conveyance were members of the so-called Mormon Battalion – volunteers recruited from Mormon emigrants, who were then headed for Utah. In October 1846, Colonel Phillip St. George Cooke led the Mormon Battalion westward from Santa Fe, New Mexico, following the Gila Trail across Arizona. After passing Gila Bend, Cooke wrote in his journal about a failed attempt to travel down the Gila by boat:

> Sixty or seventy miles above the mouth of the Gila, having more wagons than necessary, and scarcely able to get them on, I tried the experiment, with very flattering assurances of success, of boating with two pontoon wagon beds, and a raft for the running gear. I embarked a portion of the rations, some road tools, and corn. The experiment signally failed, owing to the shallowness of the water on the bars; the river was very low. In consequence of the difficulty of approaching the river, orders mistaken &c., the flour only was saved from the loading, and the pontoons were floated empty to the crossing of the Rio Colorado, where they were used as a ferry boat.[111]

Other members of the Mormon Battalion also recorded their perceptions of the Gila River, including Nathaniel V. Jones, who told of another attempt to use boats on the Gila – this time to transport cattle downstream. In early 1847 after camping near the Gila River, Jones noted that the Battalion "[s]tayed in camp all day; here we left one wagon, and made boats of two wagon beds and put about twelve oxen in each boat and started down the river."[112] There is no indication precisely where these boats were first used on the Gila or how far the group was able to travel with them.

---

[111] Philip St. George Cooke, *Report of Lieutenant Colonel Phillip St. George Cooke of His March from Santa Fe, New Mexico, to San Diego, Upper California*, H. Ex. Doc. 41, 30 Cong., 1 sess. (Washington D.C.: U.S. Government Printing Office, 1848), p. 558.

[112] Nathaniel V. Jones, "The Journal of Nathaniel V. Jones, with the Mormon Battalion," *Utah Historical Quarterly* 4:1 (1931), p. 10.

Another observer during the war with Mexico also thought boats might be used on the lower Gila – or at least speculated on the possibility. Henry Smith Turner kept a journal of his travels in the Southwest during his service in the military, and on November 19, 1846, at a place approximately eighty miles west of Gila Bend, Turner wrote:

> The Gila is assuming a much more river-like appearance – it has attained the width from 100 to 150 yards – and is in average depth about 4 feet – quite deep enough to float a steamboat – its valleys are wide, and but for the want of moisture would doubtless be covered with grass.[113]

While this description indicates that Turner believed the Gila was capable of floating boats far west of Gila Bend, nevertheless his chosen words also suggest that east of this point on the river, the stream did not have "river-like" characteristics and presumably was not capable of carrying steam boats.

Another military observer also thought – at least initially (although he later changed his mind) – that the lower Gila might be useful for transportation by water. This was true even though his descriptions of the stream suggest that its channel changed frequently and was filled with sandbars. William H. Emory took many notes of his service in the Southwest in 1846-1847, and upon his return to the East, he submitted an extensive report of his journey to Congress. As his party moved west from what is today the Gila River Indian Reservation, they "found the river spread over a greater surface, about 100 yards wide, and flowing gently along over a sandy bottom, the banks fringed with cane, willow, and myrtle."[114] On November 19, 1846, just west of the confluence of the Gila and the Salt rivers, Emory made note of the Gila's shifting channel when he wrote that his party:

---

[113] Henry Smith Turner, *The Original Journal of Henry Smith Turner with Stephen Watts Kearny to New Mexico and California, 1846-47*, H.S. Turner and D.L. Clarke, eds., (Norman: Oklahoma University Press, 1966), p. 115.

[114] William H. Emory, *Notes of a Military Reconnaissance from Fort Leavenworth in Missouri to San Diego in California*, S. Ex. Doc. 7, 30 Cong., 1 sess. (Washington D.C.: U.S. Government Printing Office, 1848), p. 92.

> encamped on an island where the valley is contracted by sand buttes in what had been very recently the bed of the river. It was overgrown with willow, cane, Gila grass, flag grass, &c. The pools in the old bed of the river were full of ducks, and all night the swan, brant and geese, were passing. . . .[115]

Despite the shifting channel, Emory believed the river had the potential for use by watercraft – an idea he later abandoned. But at this early stage of his views, Emory wrote that the "Gila, at certain stages, might be navigated up to the Pimas village, and possibly with small boats at all stages of water."[116]

Emory might have thought boats could be used on the Gila when he visited it in 1846, but nine years later, he had developed a different opinion. While sitting on the commission charged with surveying the new boundary between the United States and Mexico following the Gadsden Purchase in 1853, Emory wrote in an unpublished memo that the newly acquired United States territory on the "north side [of the new boundary line], is bounded by the *Gila River, which is not navigable*, but is a never failing stream, discharging a large volume of water. . . ." (Emphasis added.)[117]

Not only did Emory's memo indicate that he no longer considered the Gila to be navigable, but so too did his official report of the boundary commission's work to the U.S. Congress. Emory's *Report on the United States and Mexican Boundary Survey Made Under the Direction of the Secretary of the Interior*, published in 1857, included a letter Emory had drafted to the Secretary of the Interior eight years earlier. The letter commented on the nature of the

---

[115] William H. Emory, *Notes of a Military Reconnaissance from Fort Leavenworth in Missouri to San Diego in California*, S. Ex. Doc. 7, 30 Cong., 1 sess. (Washington D.C.: U.S. Government Printing Office, 1848), p. 92.

[116] William H. Emory, *Notes of a Military Reconnaissance from Fort Leavenworth in Missouri to San Diego in California*, S. Ex. Doc. 7, 30 Cong., 1 sess. (Washington D.C.: U.S. Government Printing Office, 1848), p. 95.

[117] "Memorandum," Nov. 20, 1855, Letters Sent by the U.S. Commissioner, 1848-58, Emory, U.S.-Mexican Border, box 2, Entry 399, Records of Boundary and Claims Commissions and Arbitrations, Record Group 76, U.S. National Archives II, College Park, Maryland.

Gila (which, at the time, was still the border between the United States and Mexico), and strongly suggested that navigating the river would be difficult due to its shifting bed:

> The Gila does not always run in the same bed; whenever it changes the boundary must change, and no survey nor anything else can keep it from changing. The survey of that river, therefore, as it fixes nothing, determines nothing, is of minor importance.[118]

While Emory is credited as the author of the boundary survey report, Chapter Seven of that account actually had been authored by Lieutenant Nathaniel Michler. Michler's summary supported Emory's conclusion that the Gila was not navigable by indicating that only the Colorado River was useful for boats:

> The Colorado is said to have but few tributaries; the Gila has several, emptying in above and below the Pimas villages. The annual rise in both rivers usually takes place in the months of May and June, sometimes as late as July, and is caused by the melting of the snows in the mountains near their head-waters; the freshets are not of long duration. Frequently the one stream will be up and the other down. *The Gila becomes so low that a sand-bar forms at its mouth during the summer, and at no time does it supply much water. The Colorado on the contrary, is navigable for small steamers*, drawing two and two and a half feet water, as high up as Fort Yuma. . . . This [navigation] is a great saving, as the cost of transportation of stores by trains across the desert is enormous. The navigation is pretty good, but, like all streams of the same nature, the channel frequently changes, owing to the shifting sands and the instability of its banks. [Emphasis added.][119]

Barely two years after Congress had printed Emory's *Report on the United States and Mexican Boundary Survey Made Under the Direction of the Secretary of the Interior*, another military observer confirmed Emory's assessment (as well as that of Lieutenant Michler) that the Gila River was not navigable. In March 1859, Lieutenant Sylvester Mowry gave a speech before the American Geographical and Statistical Society regarding proposals to create the Territory of

---

[118] William H. Emory, *Report on the United States and Mexican Boundary Survey* (reprint ed., Austin: Texas State Historical Association, 1987), p. 21.

[119] William H. Emory, *Report on the United States and Mexican Boundary Survey* (reprint ed., Austin: Texas State Historical Association, 1987), pp. 102-103.

Arizona out of what was then New Mexico Territory. In commenting on the resources of the region, Mowry stated the existing territory "embraces within its borders three of the largest rivers on the continent west of the Mississippi, viz: the Rio Grande, the Gila, and the Colorado of the West. *The Colorado is the only navigable stream. . . .*" (Emphasis added.)[120]

B. TERRITORIAL LEGISLATION

Military officials in Arizona were not the only people to believe that the Gila was not navigable. Barely four years after Mowry had spoken to the American Geographical and Statistical Society, President Abraham Lincoln signed a bill creating Arizona Territory out of the western part of New Mexico Territory. Among the earliest actions taken by the new Territory's legislature involved the issue of navigable streams in Arizona. Meeting in 1865 in its second session, the Arizona Territorial Legislature passed a *Memorial Asking Congress for an Appropriation to Improve the Navigation of the Colorado River*. The memorial sought $150,000 to remove obstacles such as sand bars, snags, boulders, and other obstructions in the Colorado's bed, and it declared that "*the Colorado River is the only navigable water in this Territory*[.]" (Emphasis added.)[121]

C. NEWSPAPER ACCOUNTS AND HISTORICAL PHOTOGRAPHS OF THE GILA RIVER

Although the impressions of early explorers and the declaration of the Arizona Territorial Legislature all attest to the lack of navigability of the Gila River, so too do historical newspapers reports and photographs. Because technology did not permit photography to be in use in

---

[120] Sylvester Mowry, "The Geography and Resources of Arizona and Sonora," *Journal of the American Geographical and Statistical Society* 1 (March 1, 1859): 66.

[121] *Memorial Asking Congress for an Appropriation to Improve the Navigation of the Colorado River*, in *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.

newspaper journalism in the late nineteenth and early twentieth centuries, the following newspaper accounts did not contain accompanying pictures. Nonetheless, historical photographs of the Gila River do exist, and reproductions of some of those photos have been included in the following discussion where relevant even though those photos were not parts of historical newspaper accounts. The historical photos included in this section of the report were taken following statehood and are from the files of the U.S. Bureau of Reclamation at the National Archives Branch in Denver, Colorado. Because the Bureau began work in the lower Gila Valley later than along the Salt River, the photos presented here are from the 1930s and 1940s. Nonetheless, they provide vivid examples of the nature of the Gila River.

To understand the significance of press accounts of the Gila, some background information on nineteenth and early twentieth century newspapers in the American West is necessary. Local newspapers in the American West were among their respective communities' biggest boosters, not only because of civic pride, but also due to a desire to attract settlers. 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 ran 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.

Arizona's newspapers and journals were no exception in the desire to report all positive aspects of their communities. Such benefits as the fertility of the soil, the long growing season, and assets such as schools, churches, and businesses, were all hailed in the papers of Arizona.

Importantly, the ability to market crops to distant areas was also a significant item to be reported upon, and in that regard, railroads and wagon roads were championed. Significantly, press reports did not brag about the navigability of the Gila – something they surely would have noted as a benefit to local residents.

As had been the case with military expeditions that had tried to utilize the Gila River for transportation between the Salt and Colorado rivers, there were a few non-military attempts to boat that reach of the Gila, and these events were duly noted by the press. Yet in those instances where boating was attempted, it was reported in the press more for its novelty than for being practicable on a regular and reliable basis.

On February 17, 1881, for example, the *Arizona Gazette* reported that two individuals planned to float an eighteen-foot flat-bottomed skiff from Phoenix to Yuma via the Salt and Gila rivers. The paper stated that the boat appeared "very strong and durable, and able to stand pretty severe buffeting."[122]

Either that boat trip did not take place, or it was delayed. Whatever the outcome, in late November of the same year, the *Gazette* carried the following story about a water-borne exploration of the Salt and Gila rivers: 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." (The question mark is in the original.)[123]

Four days later, the *Gazette* detailed the final outcome of the boating expedition down the Salt and Gila rivers:

---

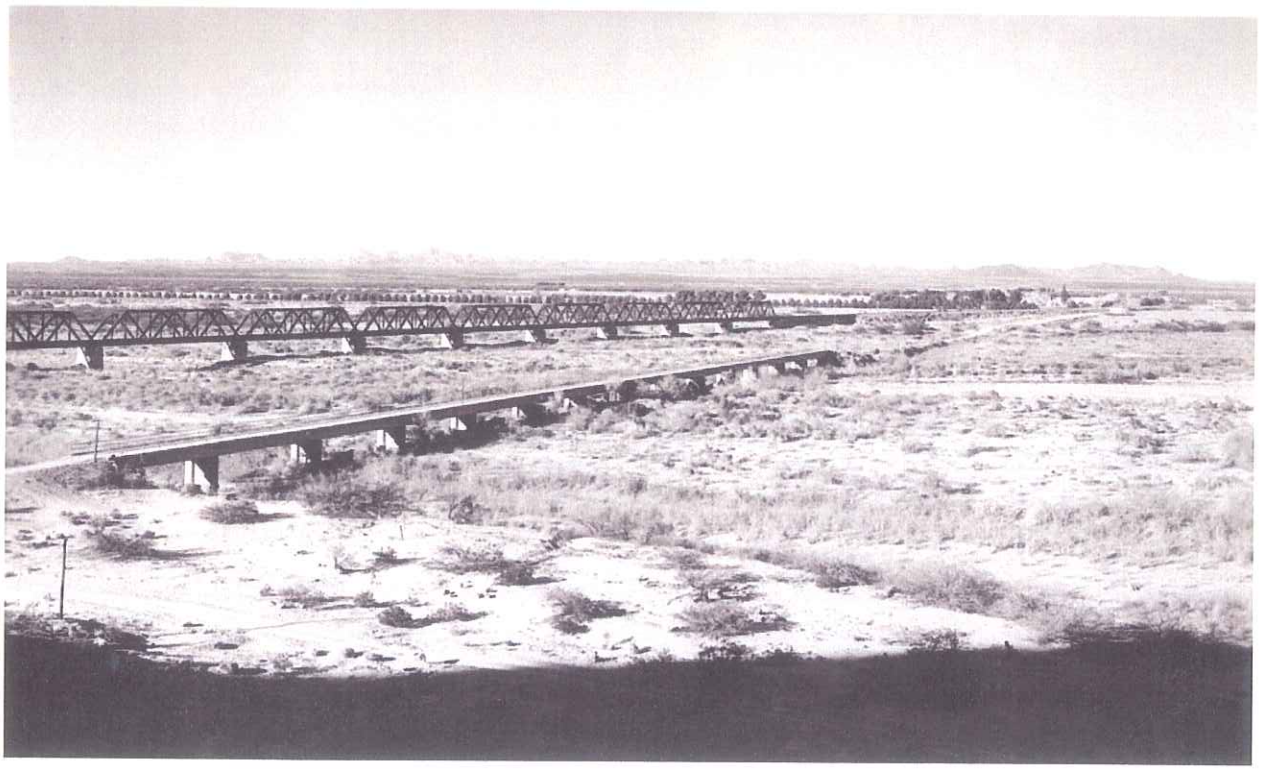
[122] [No title], *Arizona Gazette*, Feb. 17, 1881.
[123] [No title], *Arizona Gazette*, Nov. 30, 1881.

> 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.[124]

The nature of the Gila River in the vicinity of where the "Yuma or Bust" expedition busted can be seen in the following photographs. The first photograph, taken in January 1940, shows the dry Gila River channel near Antelope Hill (about 35 linear miles upstream from Yuma). The following five photos – illustrating the wide variation in flows in the stream – were taken in March 1941. The first three show the Gila River in flood near Antelope Hill, and the subsequent two photos show the Gila during the same flood a day later at McPhaul Bridge, near Dome, Arizona, and about half way between Antelope Hill and Yuma.

---

[124] [No title], *Arizona Gazette*, Dec. 3, 1881.



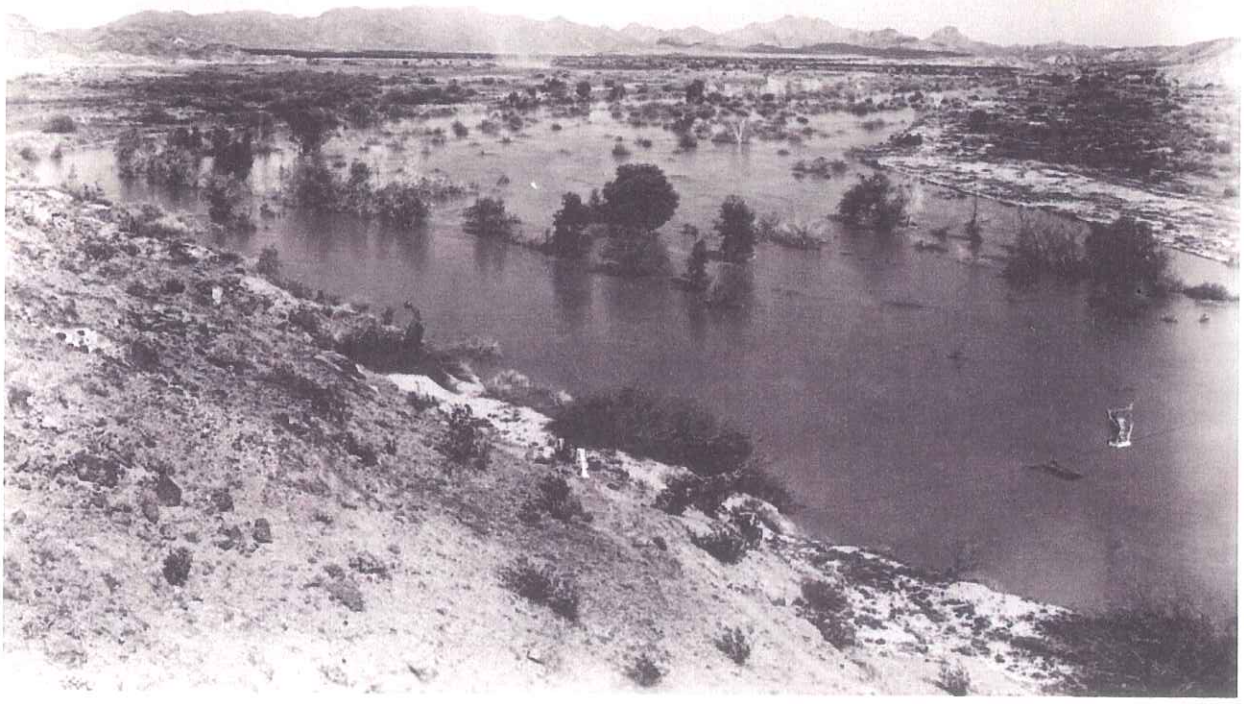
Photograph of Gila River Channel Near Antelope Hill, January 16, 1940, Records of the U.S. Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

Photograph #1 of Flood Water in Gila River Near Antelope Hill, March 19, 1941, Records of the U.S. Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

Photograph #2 of Flood Water in Gila River Near Antelope Hill, March 19, 1941, Records of the U.S. Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

Photograph #3 of Flood Water in Gila River Near Antelope Hill, March 19, 1941, Records of the U.S. Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

Photograph #1 of Flood Water in Gila River at McPhaul Bridge Near Dome, Arizona, March 20, 1941, Records of the U.S. Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph #2 of Flood Water in Gila River at McPhaul Bridge Near Dome, Arizona, March 20, 1941, Records of the U.S. Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

Ten years after the "Yuma or Bust" expedition busted, Stanton P. Allen wrote an article for *Capitol Magazine* describing his trip from Fort Yuma to Camp McDowell near Phoenix. He noted that transportation within Arizona had long gone overland, and not by boat on the Gila:

> In the ante-railroad days of the territory all freight for the interior was transported in bull trains. From Yuma to Tucson, 260 miles, the merchandise for the stores, and goods of all kinds were shipped in wagons.[125]

---

[125] Stanton P. Allen, "After the Indians," *Capitol Magazine* I (Aug. 1, 1891).

Only two years later, however, D.K. Allen reported in *Arizona Magazine* that a steam wheeler had attempted to use the Gila River occasionally. Ultimately, he observed, the boat was unable to navigate the Gila on a regular basis:

> The stern wheel iron steamer *Explorer* of Lieut. [J.C.] Ives, was the third steamer on the Colorado. She [the *Explorer*] was sent here in 1857 by the U.S. Government, and run on the Colorado and Gila rivers until 1864, when she became unmanageable, as she came out of the Gila river, up which she had been after a load of wood. The current of the river carried her down to Pilot Knob where she was made fast to a tree on the bank. The bank caved in, when tree, steamer and all, floated into a slough eight miles below. The channel of the river changed, and her iron frame now lies miles from the river, overshadowed by the cottonwood trees two feet or more in diameter.[126]

Another author, Isaac N. Taylor, also writing in the late nineteenth century, provided a detailed description of the Gila River. Appearing in the *Southwest Illustrated Magazine* in 1896, Taylor's article commented that although the Gila stretched over four hundred miles through Arizona:

> It is what would be called a small stream . . . so far as surface water is concerned, because not only itself but all its tributaries pass through valleys of sand, gravel and boulders of great depth, and therefore have a broad and deep underflow. But because of rare great floods, carrying the loose alluvial soil away, the banks are usually far apart, varying from say twenty to a hundred and sixty rods, while the current itself on the surface, especially where drained away by irrigating canals, is all the way from nothing to eight to ten rods.[127]

Perhaps having heard of the "Yuma or Bust" attempt to float down the Salt and Gila rivers from Phoenix to Yuma, in 1905 another party decided to attempt the feat again. On March 24, 1905, the *Arizona Republican* carried the story, "The Phoenix Shipyard," an article about a local resident who planned to take advantage of that season's floods and ride a self-built boat

---

[126] D.K. Allen, "The Colorado River," *Arizona Magazine* II (Aug. 1, 1893).
[127] Isaac N. Taylor, "The Gila Valley, Arizona," *The Southwest Illustrated Magazine* II (May 1, 1896).

downstream from Phoenix to Yuma. The story indicated that the construction and use of such a boat was extremely unusual.[128]

D. SUMMARY AND CONCLUSIONS REGARDING MISCELLANEOUS DOCUMENTS, PRESS ACCOUNTS, AND HISTORICAL PHOTOGRAPHS

The wide variety of the miscellaneous documents, press accounts, and historical photographs discussed above all point to the same conclusion that the Gila River was not navigable prior to or at the time of Arizona statehood in 1912. The documents, press stories, and photographs clearly demonstrated that the Gila was unreliable for the purposes of consistent commercial navigation. Fluctuating flows, channel changes, and dams all combined to cause major impediments to any sort of regular commerce on the Gila River. Such boating that did take place was noteworthy only for its novelty.

---

[128] "The Phoenix Shipyard," *Arizona Republican*, March 24, 1905.

CHAPTER V: WESTERN WATERCRAFT AT THE TURN OF THE CENTURY

At the turn of the twentieth century, the only river in the Southwest to be considered by most observers to be navigable was the Colorado. That stream's many sandbars, its widely fluctuating flow, and its generally unpredictable nature made the Colorado a testing ground for boats with shallow drafts and lightweight construction. Many attempts were made to navigate this tempestuous stream from its mouth in the Gulf of California as far upstream as possible, and stories of such expeditions appeared in a multitude of newspapers, promotional publications, as well as in published government documents. The significance of such attempts to navigate the Colorado was not lost on prospective businessmen, possible settlers, and military officials, all of whom hoped for easier access to the interior parts of the southwestern United States. The Colorado, of course, was not the only western river that experienced efforts to navigate it (others included the Columbia, Sacramento, and San Joaquin, to name a few), but the Colorado was the only river that offered possible water-borne access to the American Southwest.

From accounts of river expeditions on the Colorado, therefore, some details about boat technology in relation to southwestern rivers around the time of Arizona statehood can be discerned. This is not to say that river travel was not attempted on other southwestern streams – indeed, it certainly was because water travel in the nineteenth century was by far the most economical method of internal communication. Nevertheless, river navigation on other southwestern streams proved to be unreliable and risky, and the Colorado River was the only stream in the region where sustained attempts at regular navigation occurred. Therefore, a brief examination of the history of navigation on the Colorado can provide useful insight into the

nature and technology of watercraft used for transportation on southwestern rivers at the turn of the century.

Additional information about southwestern watercraft operation can be found in reports written to describe general advances in boat construction. This information, when combined with experiences on the Colorado River, can help shed light on the navigability of Arizona's streams such as the Gila River.

A. NAVIGATION ON THE COLORADO RIVER

Following the acquisition of much of the western part of the United States in the 1840s and 1850s, federal authorities sent many explorers to the West to determine just what the new region held. Most often, these parties consisted of military officers who kept journals of their travels, making note of the natural environment, Indians, and possibilities for settlement. Some of these expeditions included references to travel on western rivers, notably the Colorado, although not all specified what types of vessels were used.

Probably the most famous of these was the first expedition of John Wesley Powell through the Grand Canyon on the Colorado River in 1869 (see below for photographs of Powell). Powell, who used a wooden dory to make the first of two descents through the previously unexplored gorge, made it clear after the first trip that while he had survived the experience, the multitude of rapids and other obstacles along this portion of the Colorado made it hardly practicable as a possible water-based access route to the interior part of North America. Indeed, his experiences and those of his companions proved to be so frightening that several of them

opted to climb out of the canyon (where they were subsequently killed by Indians) rather than continue on the river.[129]

Photographs of John Wesley Powell in 1869 and 1874, U.S. National Park Service

Powell made a second trip down the Colorado River in 1871-1872 that focused more on gathering scientific information than had the first. This second expedition – unlike the first – was made during low water, and while the rapids on this trip were not as frightening as during the first venture down the Colorado, the second expedition still had major difficulties bypassing rocks and rapids.[130] On that expedition Powell brought a photographer, and some of the resulting photos documented the nature of the dories Powell used on the second trip (see below).

---

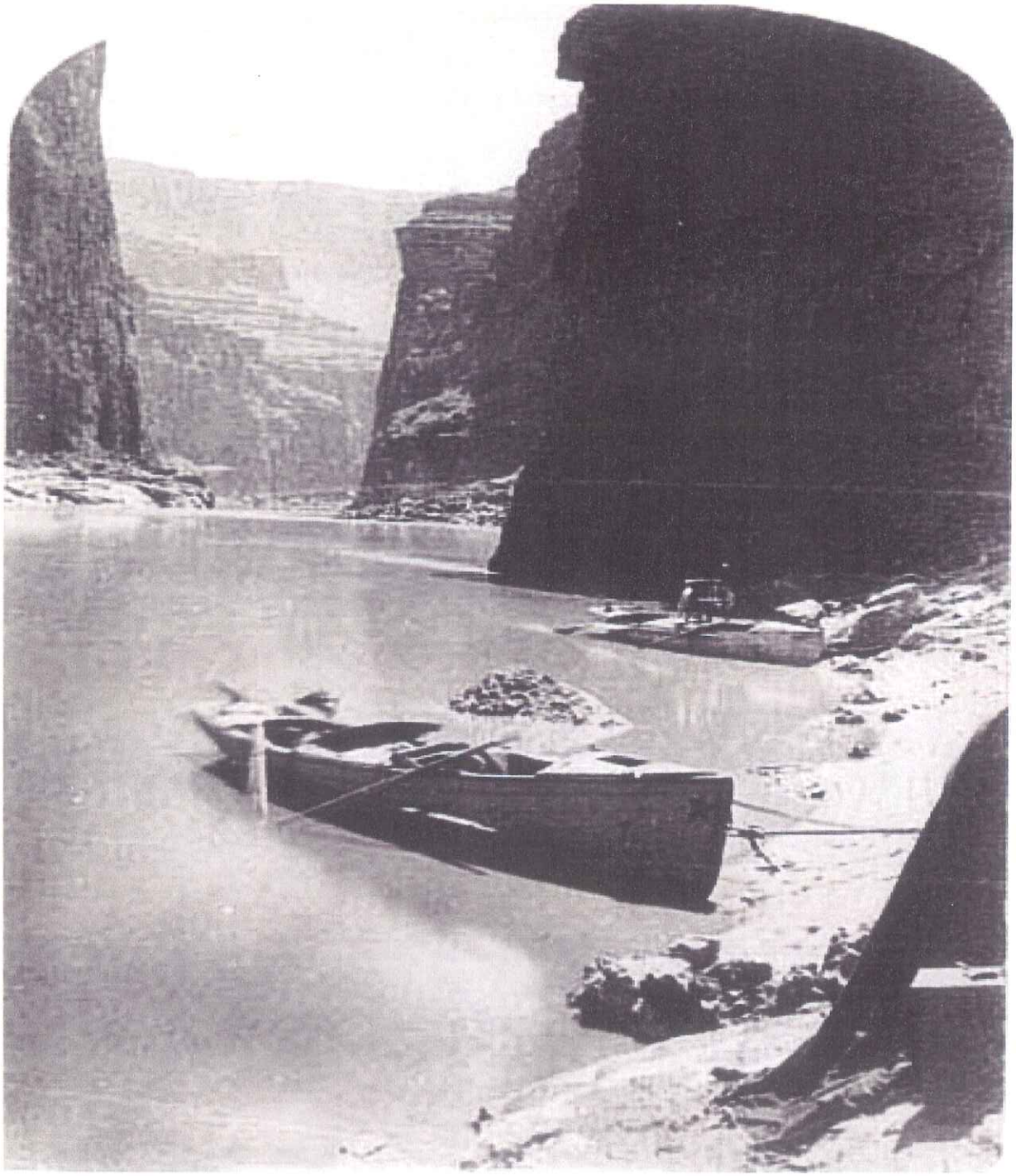
[129] See generally Wallace Stegner, *Beyond the Hundredth Meridian: John Wesley Powell and the Second Opening of the West* (Boston: Houghton-Mifflin, 1954).

[130] http://3dparks.wr.usgs.gov/3Dcanyons/html/glencanyon.htm (accessed May 9, 2005). For details on Powell's expeditions down the Colorado, see *Exploration of the Colorado River of the West and Its Tributaries*

Photograph of Powell's Dories on the Colorado River, 1871-1872, Grand Canyon National Park Collection

---

Explored in 1869, 1870, 1871 and 1872, under the Direction of the Secretary of the Smithsonian Institution (Washington, D.C.: U.S. Government Printing Office, 1875).



Photograph of a Closer View of Powell's Dories on the Colorado River, 1871-1872, Grand Canyon National Park Collection

Photograph of Another View of Powell's Dories on the Colorado River, 1871-1872, Grand Canyon National Park Collection

Photograph of Powell's Expedition on the Colorado River, 1871-1872, Grand Canyon National Park Collection

Whereas Powell had chosen to go downstream on the Colorado, other explorers tested the river's navigability by moving upstream from its mouth in the Gulf of California. Lieutenant Joseph Christmas Ives (better known as "J.C." Ives), for example, was one such officer. Ives (who is discussed above in Chapter IV in relation to an attempt to navigate the Gila River in the late 1850s and early 1860s) was sent a decade before Powell made his descent down the Colorado to assess the utility of that stream as a navigable waterway from where it discharged into the Gulf of California upriver to the Virgin River (today, near the central part of Lake Mead). Following his return to the East, Ives completed his report on March 23, 1858. In his account, Ives discussed the problems associated with navigating the Colorado, and he offered a recommendation for the type of boat for future use on the Colorado if the U.S. Government wanted to use it for transportation on a regular basis.

Although his experience was nowhere near the terrifying ordeal later endured by Powell and his colleagues (in part because his exploration was below the Grand Canyon), Ives reported that the Colorado River was extremely difficult to navigate because the "channel is exceedingly circuitous and constantly shifting." Furthermore, Ives noted repeatedly the presence of sand bars and shoals, writing that

> boats rarely make a trip between tide water and Fort Yuma without grounding many times a day. By working them about in the shifting sand . . . and as a last resort, by lightening the boat of the cargo, these shoals may always be passed with more or less labor.

Due to these hazardous and difficult conditions, Ives recommended an "iron stern wheel boat, with the hull 100 feet long and the greatest breadth of beam 22 feet-built sufficiently [illegible] to ensure a drought when light, not exceeding 12 inches." Although Ives believed that five trips a year could be made on this river in such a watercraft, he repeatedly asserted that it was an extremely troublesome stream to navigate due to the rip and spring tides near its mouth, the constantly shifting channel, the numerous obstacles along the river, and finally, the rapids near the mouth of the Virgin.[131]

Other reports of attempts to navigate the Colorado suggested that the river had greater transportation possibilities than Lieutenant Ives had given it. *The History of Arizona Territory Showing its Resources and Advantages with Illustrations: Descriptive of its Scenery, Residences, Farms, Mines, Mills, Hotels, Business, Houses, Schools, Churches, Etc.* (1884), for instance, provided excellent descriptions of the rivers of Arizona as well as boating in the late nineteenth

---

[131] J.C. Ives, "Report Upon Navigable Portion of Colorado River, March 23, 1858," pp. 1, 2, 7, box 2, Entry 726, Records of the Office of Explorations and Surveys, Miscellaneous Records, Records of the Office of the Secretary of the Interior, Record Group 48, U.S. National Archives II, College Park, Maryland. Ives's report was subsequently published as J.C. Ives, *Report upon the Colorado River of the West, Explored in 1857 and 1858 by Lieutenant Joseph C. Ives, Corps of Topographical Engineers* (Washington, D.C.: U.S. Government Printing Office, 1861).

century. This publication noted that the ship *Explorer* (probably not Ives's boat discussed in Chapter IV because that boat had become no longer serviceable by the mid-1860s unless it had been rescued and repaired from where it had gone aground) soon was expected to ascend the Colorado River. The *Explorer* was fifty-four feet long from the bow to the stern wheel. This was about half the length that Ives had recommended for the Colorado River, presumably to make the craft more maneuverable in the shifting channel. Nevertheless, the *Explorer*'s draft was reported to be two and a half feet, considerably more than Ives believed to be feasible on the Colorado River, at least if it was to ascend as far as the Virgin River.[132]

While this account of a watercraft capable of navigating the Colorado was more promising than that offered by Lieutenant Ives, its tone of confidence, however, should be tempered with the knowledge that the book – as its title suggested and like many similar regional chronologies of the day – had been paid for by western promoters eager to attract businesses and settlers to the sparsely populated part of the United States. Ives's report, therefore, is probably more objective regarding the Colorado's possibilities as a transportation artery, at least below the Grand Canyon. Nevertheless, other attempts by paddle wheel steamboats confirmed that the Colorado River could, in fact, be used by such craft.[133]

Other accounts printed in U.S. Government documents further acknowledged the possibilities of using the Colorado below the Grand Canyon as an artery of commerce and transportation. A letter from Mr. J.A. Mellon, Master of the Colorado River steamer *Cochran*, to the Bureau of Corporations written on January 30, 1907, noted that his ship weighed 237 tons

---

[132] *History of Arizona Territory Showing its Resources and Advantages with Illustrations: Descriptive of its Scenery, Residences, Farms, Mines, Mills, Hotels, Business, Houses, Schools, Churches, Etc.* (San Francisco: Wallace W. Elliot & Co., 1884).

[133] For details on various steamboats used on the Colorado River, see Kay Muther, "Paddle-wheelers on the Colorado," *Wild West Magazine*, Aug. 2004.

and drew 20 inches of water when light and an additional 1 inch of water for every 10 tons of freight. At the end of his letter, Mellon wrote that "I have come to the conclusion that any river that has over 4 feet fall to the mile can not compete with a railroad for freight or passengers." According to other records of the Bureau of Corporations, another Colorado ship (actually, more like a barge), the *Silas J. Lewis*, weighed 100 tons, drawing seven inches of water with no load and one inch more for every eleven tons.[134]

B. WESTERN WATERCRAFT IN GENERAL

Regarding western rivers more generally, the 1909 report of the Commissioner of Corporations provided additional insight on the state of navigation in the Southwest around the time of Arizona statehood in 1912. This document contained information about the types of vessels being used for navigation at the time. The report noted that "[o]n the western rivers there soon appeared the well-known flat-bottom, stern-wheel steamboat, adapted to the shallow waters of those streams, the design of which has not greatly changed for half a century." "[T]hose [vessels]," the report added, "used in the river trade are still mainly built of wood."[135] When specifically discussing river steamers, the report stated that:

> [r]equirements on the western rivers are the least possible load draft, economical speed, readiness of handling the vessel, and freight and passenger capacity. In the case of towboats large reserve power is an important item.[136]

Although the report conceded that little change had been made in the stern-wheel, light-draft steamers in two decades, it declared that recently "a new type of light-draft steamer has been developed, with screwpropeller built in a tunnel in the after part of the vessel."[137]

---

[134] *Report of the Commissioner of Corporations on Transportation by Water in the United States, Water-Borne Traffic* (Washington D.C.: U.S. Government Printing Office, 1909), pp. 370-371.

[135] *Report of the Commissioner of Corporations on Transportation by Water in the United States, General Conditions of Transportation by Water* (Washington D.C.: U.S. Government Printing Office, 1909), pp. 128-129.

[136] *Report of the Commissioner of Corporations on Transportation by Water in the United States, General Conditions of Transportation by Water* (Washington D.C.: U.S. Government Printing Office, 1909), p. 138.

Water Trails West, a more recent (and more objective) compilation of essays by western writers regarding various western streams, included one article containing additional information about navigation on the Colorado River as well as other western waterways. This essay, by Donald H. Bufkin and C.L. Sonnichsen, indicated that boats larger than that proposed by Ives were used successfully on the Colorado. According to Bufkin and Sonnichsen, the largest ship to use the Colorado was the *Mohave II*. With a length of 175 feet (over three times that of the *Explorer* described in the *History of Arizona Territory* and one and three quarters as long as Ives' boat), the *Mohave II* had a 32-foot beam. This was 10 feet wider than Ives' recommendation. The *Mohave II* was approximately 190 tons and drew less than two feet of water. (Ives suggested only one foot, while the *History of Arizona* claimed two and a half). Other boats similar to the *Mohave II* in use in the West, according to Bufkin and Sonnichsen, were all over 100 feet in length and over 25 in width. Further, these vessels were generally stern-wheeled, making them easier to navigate streams filled with sandbars and shallow water.[138]

C. SUMMARY AND CONCLUSIONS REGARDING WESTERN WATERCRAFT

The state of boating technology around the turn of the century make it clear that the Gila River was not susceptible to navigation at the time of Arizona statehood. The flow in the Gila was not consistent enough to support the boats used for transport. A draft of two feet could not be had in a river that was sometimes only a few inches deep. Even the dories used by John Wesley Powell to go down the Colorado River would have had a difficult time using the Gila River on a reliable basis – as can be seen in the newspaper reports about the "Yuma or Bust"

---

[137] *Report of the Commissioner of Corporations on Transportation by Water in the United States, General Conditions of Transportation by Water* (Washington D.C.: U.S. Government Printing Office, 1909), p. 139.

[138] Donald H. Bufkin and C.L. Sonnichsen, "Steamboat Through Hell: River Traffic on the Colorado of the West," in *Water Trails West*, (Garden City: Doubleday & Company, 1978), pp. 218-230.

expedition. Furthermore, the Gila's shifting nature made its course unreliable as well as dangerous. The status of watercraft at the time of Arizona's statehood in 1912 – as described in historical literature and illustrated in photographs – make it clear that no such vessels could be utilized on a regular and reliable basis on the Gila River.

SUMMARY AND CONCLUSIONS

Since modern settlement began in Arizona in the mid-nineteenth century, there have been a multitude of documents created describing the Gila River. These cover a wide spectrum of published and unpublished sources, including U.S. Government and State (and Territorial) materials, diaries, journals, reminiscences, and other archival records.

Some of the most important sources for ascertaining the nature of the Gila 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. A substantial part of the area through which the Gila River flowed was surveyed prior to 1912, and in some cases resurveys were done for some sections of the river. Significantly, although these surveys were undertaken by many 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 Gila River was navigable. While some sections of the stream were, in fact, meandered, the surveyors' field notes clearly show that those meanders had been done to conform with surveying instructions not related to navigability. In addition, the field notes and plats illustrated a stream that varied enormously in flow and that had a changing channel in many places. Moreover, the notes and plats contain references to roads and railroads paralleling the Gila, suggesting that transportation was carried out on land and not on the river.

Supporting the U.S. Government surveys' determination that the Gila River was not navigable are federal government homestead patents, U.S. grants to Arizona, and Arizona's

disposition of those lands. Many patents were issued by the U.S. Government Land Office to parcels of land through which the Gila River 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. Furthermore, when lands were granted to Arizona through which the Gila 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 Gila 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 Gila River ran, the State made no indication that it was withholding the bed of the river due to navigability and the public's interest.

The U.S. and State grant and patenting process is significant in relation to determining the Gila 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 Gila 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 Gila 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 Gila River was not navigable in 1912 are other published and unpublished records of the U.S. Government. Records of the U.S. Geological Survey and the Reclamation Service describe a stream that was extremely erratic in flows, unreliable in relation to channels, subject to severe floods, and potentially dangerous.

Much like the federal agencies' records, explorers' journals, personal reminiscences, other historical documents, and more recent historical studies all reached the same conclusion regarding the lack of navigability of the Gila River. Indeed, the Arizona Territorial Legislature in 1865 declared that the only stream in Arizona that was navigable was the Colorado, and Odie Faulk, in his study of the Gila Trail, noted the lack of navigable waterways in the region.

From this wealth of information, covering a huge array of documentary sources, only one conclusion can be reached: The Gila River was not navigable or susceptible of navigation on or before February 14, 1912.

APPENDIX A – UNPUBLISHED SOURCES – STATE ARCHIVES AND AGENCIES

A. ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

FILE TITLE: Letter from James Johnson to Messrs. Brashear, Eisenhower, Evans, Miller and Ms. Getzwiller, Dec. 10, 1996

FILE TITLE: Gila River Navigability Study

FILE TITLE: Land Ownership Maps for the Gila River Navigability Study

FILE TITLE: ANSAC, In the Matter of the Navigability of the Gila River, Submittal of Ownership Evidence Re: Public Trust

FILE TITLE: John S. Schaper to Christina Waddell, Aug. 30, 1996, on Behalf of Buckeye Irrigation Company re: Navigability of the Gila River

B. ARIZONA STATE UNIVERSITY, ARIZONA HISTORICAL FOUNDATION

FILE TITLE: 4331 P3 P25 1880 AZ

COLLECTION: Hancock Family Collection
FILE TITLE: Maricopa County Superior Court – *Nels Benson vs. J Allison & . . . Others*
LOCATION: box 2, file 16

COLLECTION: Newspaper Index
FILE TITLE: "Arizona Newspaper Project"

C. ARIZONA STATE UNIVERSITY, LUHRS READING ROOM

COLLECTION: Joseph and Grace Alexander Papers
FILE TITLE: MSS # 11 Alexander Papers, Box 15, Folder 43
LOCATION: Box 15, Folder 43

COLLECTION: Philip A. Bailey Papers, MSS 91
FILE TITLE: "Gila River Route"
LOCATION: Box 14, Folder 7

COLLECTION: Roland Gail Baker Collection
FILE TITLE: Roland Gail Baker, Box 10, Folder 3

LOCATION: Box 10, file 3

COLLECTION: Carl Hayden Papers, MSS 01
FILE TITLE: "Folder 25"
LOCATION: Box 607, folder 25

COLLECTION: Carl Hayden Papers, MSS 01
FILE TITLE: San Carlos Reservoir Documents
LOCATION: Arizona Room

COLLECTION: Carl Hayden Papers, Mss. 001
FILE TITLE: "Speech of Hon. Carl Hayden, of Arizona, in the House of Representatives, Thursday, February 3, 1916"
LOCATION: folder 11, box 653

COLLECTION: Perley M. Lewis Collection
FILE TITLE: MSS-50 Perley M. Lewis, Box 5, Folder 3
LOCATION: Box 5, Folder 3

COLLECTION: Luhrs Family Papers
FILE TITLE: MSS # 52, Luhrs Papers, Box 49, Folder 12
LOCATION: Box 49, Folder 12

COLLECTION: Stuart Family Papers
FILE TITLE: Papers Relating to the Colorado River Compact
LOCATION: Box 9, Folder 2

D. ARIZONA STATE ARCHIVES

COLLECTION: Interstate Stream Commission, RG 141
FILE TITLE: Corgait Canal - Maricopa County - Gila River
LOCATION: Box 83

COLLECTION: Interstate Stream Commission, RG 141
FILE TITLE: General Memo Re: Reserved Powers of the U.S. in Navigable Waters
LOCATION: Box 20

COLLECTION: Interstate Stream Commission, RG 141
FILE TITLE: Gila Land & Water Co. - Maricopa County - Gila River
LOCATION: Box 83

COLLECTION: Interstate Stream Commission, RG 141
FILE TITLE: Gila Land And Cattle - Maricopa County - Gila River
LOCATION: Box 83

COLLECTION: Interstate Stream Commission, RG 141

FILE TITLE: Gila Land And Cattle Company vs. The Gila Water Company, Findings and Decree
LOCATION: Box 59

COLLECTION: Interstate Stream Commission, RG 141
FILE TITLE: New Dendora Canal Com. - Maricopa County - Gila River
LOCATION: Box 83

COLLECTION: Maricopa County Superior Court, Water Commissioner
FILE TITLE: Filmfile 137.1.1, Civil Cases 4526-4824, Jan 1905 to May 1905, p. 124
LOCATION: Filmfile 137.1.1 - 137.1.7

COLLECTION: Maricopa County Superior Court, Water Commissioner
FILE TITLE: Filmfile 137.1.2, Civil Cases 4526-4824, Jan. 1905 to May 1905, pg. 125
LOCATION: Filmfile 137.1.1 - 137.1.7

COLLECTION: Maricopa County Superior Court, Water Commissioner
FILE TITLE: Filmfile 137.1.3, Civil Cases Series One Litigation 17-32
LOCATION: Filmfile 137.1.1 - 137.1.7

COLLECTION: Maricopa County Superior Court, Water Commissioner
FILE TITLE: Filmfile 137.1.4, Civil Cases Series One Litigation 32-45
LOCATION: Filmfile 137.1.1 - 137.1.7

COLLECTION: Maricopa County Superior Court, Water Commissioner
FILE TITLE: Filmfile 137.1.5, Civil Cases Series One Litigation 46, Series Two Decree Implementation 68
LOCATION: Filmfile 137.1.1 - 137.1.7

COLLECTION: Maricopa County Superior Court, Water Commissioner
FILE TITLE: Filmfile 137.1.6, Series Two Decree Implementation 69-72
LOCATION: Filmfile 137.1.1 - 137.1.7

COLLECTION: Maricopa County Superior Court, Water Commissioner
FILE TITLE: Filmfile 137.1.7, Series Two Decree Implementation 73-79
LOCATION: Filmfile 137.1.1 - 137.1.7

COLLECTION: RG 141, Interstate Stream Commission
FILE TITLE: Lyman Decree on Gila
LOCATION: Box 25

COLLECTION: RG 59, Arizona State Land Commission
FILE TITLE: Arizona State Land Department Historical Records Index f. 322 - f. 328
LOCATION: Filmfile # 51.28.8

COLLECTION: RG 59, Arizona State Land Commission

FILE TITLE: Arizona State Land Department Historical Records Index f. 366-f. 393
LOCATION: Filmfile # 51.28.10

COLLECTION: RG 59, Arizona State Land Commission
FILE TITLE: f. 21
LOCATION: Filmfile 51.28.1

COLLECTION: RG 59, Arizona State Land Commission
FILE TITLE: f. 22
LOCATION: Filmfile 51.28.1

COLLECTION: RG 59, Arizona State Land Commission
FILE TITLE: f. 371
LOCATION: SS 299, 133925 [Gunther and Shirley v. State of Arizona]

COLLECTION: RG 59, Arizona State Land Commission
FILE TITLE: f. 372
LOCATION: SS 299, 133925 [Gunther and Shirley v. State of Arizona]

COLLECTION: RG 59, Arizona State Land Commission
FILE TITLE: f. 373
LOCATION: SS 299, 133925 [Gunther and Shirley v. State of Arizona]

COLLECTION: RG 59, State Land Commission
FILE TITLE: Land Granted State in 1894 Revealed
LOCATION: SS (?)f.469

COLLECTION: RG 59, State Land Commission
FILE TITLE: f. 443
LOCATION: SS 342, f. 443

COLLECTION: Records of the Secretary of the Territory of Arizona
FILE TITLE: Report on Resources of the Salt River Valley [ca. 1872]
LOCATION: Box 49, file 710

E. SALT RIVER PROJECT ARCHIVES

FILE TITLE: "Drainage Map of Arizona Showing Perennial Streams and Some Important Wetlands"

FILE TITLE: (April-May, 1915) Water Power Utilization in Arizona, "Part I, Introduction" and "Salt River & Smaller Tributaries"

COLLECTION: Gila River (N.D. thru 1939)
FILE TITLE: "Gila Bend Project, Arizona"

COLLECTION: Gila River (N.D. thru 1939)
FILE TITLE: "Report on Lands Withdrawn for Water Power Purposes Along the Gila River in Arizona and New Mexico"

COLLECTION: Newspaper Clippings
FILE TITLE: "Ap. 21, 1903 to Ap. 16, 1904; p. 2450-2699"
LOCATION: Black Binders

COLLECTION: Newspaper Clippings
FILE TITLE: "Feb. 14, 1902 to Ap. 20, 1903; p. 2200-2449"
LOCATION: Black Binders

COLLECTION: Newspaper Clippings
FILE TITLE: "Jan. 1912 to Nov. 1912"
LOCATION: Black Binders

COLLECTION: Newspaper Clippings
FILE TITLE: "Newsclips 2/1904 - 10/1906"
LOCATION: Black Binders

APPENDIX B – UNPUBLISHED SOURCES – FEDERAL ARCHIVES, AGENCIES, AND MISCELLANEOUS ARCHIVES

A. BANCROFT LIBRARY, BERKELEY

FILE TITLE: Dictation by Abraham Frank
LOCATION: Banc MSS P-D 12:5

FILE TITLE: Dictation of Charles Baker
LOCATION: Banc MSS P-D 12:2

FILE TITLE: Dictation of George M. Thurlow
LOCATION: Banc MSS P-D 12:10

FILE TITLE: Dictation of John W. Dorrington
LOCATION: Banc MSS P-D 12:4

FILE TITLE: Duncan, Fountain of the Gila River, 1883-1983
LOCATION: pf F818 D8D8 1983

FILE TITLE: Gila Expedition Papers
LOCATION: Banc MSS P-E 202:1-18

FILE TITLE: Irrigated Lands, the Best in the World for Fruit and Vine Culture are Found Under the Gila Bend Canal on the Lower Gila River
LOCATION: F 808 .A5 v. 2x

FILE TITLE: Letter to Father Antonio de Balthazer, Treasurer of the Jesuit Province of Mexico
LOCATION: Banc MSS P-D 102

FILE TITLE: Mortgage on Ambrosio Arvizo's property on the Gila River, to Mrs. Anna Woffenden
LOCATION: Banc MSS P-D 100:3

B. U.S. NATIONAL ARCHIVES, ROCKY MOUNTAIN REGION, DENVER

COLLECTION: RG 115, U.S. Bureau of Reclamation

FILE TITLE: "37-A Preliminary Investigations, Arizona-General Thru Nov. 1929"
LOCATION: General Correspondence File (Straights) #37-A

FILE TITLE: "37-A-5 Straights, Investigations—Sentinel Project, January 1936 thru____ 37-A-5"
LOCATION: General Correspondence File (Straights) #37-A, Box 532

FILE TITLE: "37-A-5 Straights, Preliminary Investigations-SENTINEL PROJECT 37-A-5"
LOCATION: General Correspondence File (Straights) #37-A

FILE TITLE: "429 SAN CARLOS Preliminary Reports of Engineers Submitting Plans Estimates etc. To Dec 31, 1911, 429"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919, San Carlos Project

FILE TITLE: "429 SAN CARLOS. Preliminary Reports of Engineers, Submitting Plans, Estimates, Jan 1, 1912 to...429"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919, San Carlos Project

FILE TITLE: "429-A SAN CARLOS. Miscellaneous 429-A"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919, San Carlos Project

FILE TITLE: "757-D1 Cooperation with Office of Indian Affairs. Gila River & Pima Ind. Res. Thru 1905."
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "757-D1 Cooperation With Office of Indian Affairs. Gila River & Pima Ind. Resv. 1910 thru June 1911. 757-D1"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "757-D1 Cooperation with Office of Indian Affairs - Gila River and Pima Indian Reservation, 1913-"
LOCATION: General Administrative and Project Records, 1902-1919

FILE TITLE: "757-D1 Cooperation with Office of Indian Affairs. Gila River & Pima Ind. Resv. 1912. 757-D1"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "757-D1 Cooperation with office of Indian Affairs. Gila River & Pima Ind. Resv. 1906 thru 1909 757-D1"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "Annual Project History, Gila Project, Yuma, Arizona, 1939, Volume IV"
LOCATION: Engineering & Research Center PROJECT HISTORIES

FILE TITLE: "General Correspondence Re: Right of Way Applications"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "Prior Reports, Gila River Basin, Arizona-New Mexico."
LOCATION: Studies, Reports, & Projects, 1899-1978, Box 147, File 1, 8NS-115-93-001

FILE TITLE: "Report on San Carlos Project, Arizona, 1920"
LOCATION: Engineering & Research Center PROJECT REPORTS

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineers Reports, January 1, 1914 - December 31, 1914."
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "SALT RIVER PROJECT. Board of Survey Reports. 544-D"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "SALT RIVER PROJECT. Classification of Lands, Soil Surveys 559"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "SALT RIVER PROJECT. Corres. Re Board of Survey 544-D"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "SALT RIVER PROJECT. Water Appropriations"
LOCATION: Entry 3, General Administrative and Project Records, 1902-1919

FILE TITLE: "San Carlos Project Report on Water Supply"
LOCATION: Studies, Reports, & Projects, 1899-1978, Box 146, File 9, 8NS-115-93-001

FILE TITLE: "Sedimentation in San Carlos Reservoir Gila River, Arizona"
LOCATION: Engineering & Research Center PROJECT REPORTS

FILE TITLE: "Soil Reconnaissance of the Sentinel Project — Arizona"
LOCATION: Studies, Reports, & Projects, 1899-1978, Box 146, File 10, 8NS-115-93-001

C. U.S. NATIONAL ARCHIVES, MAIN BRANCH, WASHINGTON, D.C.

COLLECTION: Microfilm

COLLECTION: M95, roll 3
FILE TITLE: "Itinerary of the El Paso and Fort Yuma Wagon Road Expedition"

COLLECTION: Record Group 75, U.S. Bureau of Indian Affairs

FILE TITLE: "12797, 1891, S.C. #190, San Carlos Irrigation"
LOCATION: Entry 102, box 213
FILE TITLE: "48987, 1916 Pima 341"

LOCATION: Entry 121, Pima, Box 2868-16-341 Pt. 9 to 49718-18-341

FILE TITLE: "27710, 1918 Pima 341"
LOCATION: Entry 121, Pima, decimal 341, box 2868-16-341 Pt. 9 to 49718-18-341 Pt. 1

FILE TITLE: "2868-16, 341, Part 3"
LOCATION: Classified Files, 1907-1939, Pima, 89495-10-339 to 16721-10-341 Pt. 2

FILE TITLE: "49718, 1918 Pima 341"
LOCATION: Entry 121, Pima, decimal 341, box 49718-18-341 Pt. 2 to 89655-19-341 Pt. 1A

FILE TITLE: "65717-12 San Carlos 341"
LOCATION: Entry 121, San Carlos, Box 56874-35-339 - 20521-14-341

FILE TITLE: "73038, 1916 Pima 341"
LOCATION: Entry 121, Pima, decimal 341, box 2868-16-341 Pt. 9 to 49718-18-341 Pt. 1

FILE TITLE: "Annual Report -1913- Southern California and Southern Arizona Reservations, Supt. of Irrigation"
LOCATION: Entry 655, Box 29

FILE TITLE: "Annual Report of Chief Engineer, 1913"
LOCATION: Entry 654, Box 1

FILE TITLE: "Annual Report, Chief Engineer, Indian Service, Fiscal Year 1910"
LOCATION: Entry 654, Box 1

FILE TITLE: "Gila River 1902"
LOCATION: Entry 653, District 4, Box 82

FILE TITLE: "History of the Construction of the Ashurst Hayden Dam, By C.R. Olberg, Mar. 1, 1922"
LOCATION: Entry 657, Ashurst Hayden Dam and Florence Dam, 1916-22, Box 23

FILE TITLE: "History of the Papago Indians and History of Irrigation, Papago Indian Reservations, Arizona. Dec., 1917"
LOCATION: Entry 657, Papago Reservation, 1913-17, Box 30

FILE TITLE: "Memo and Recommendations of Mr. Truesdell Concerning the Water Rights of the Pima & Papago Indians, May, 1913"
LOCATION: Entry 657, Papago Reservation, 1913-17, Box 30

FILE TITLE: "Pima, Maricopa, A Report, By J.R. Meskimons, Aug. 1904"
LOCATION: Entry 657, Gila River Project, 1906-1940, Box 15

FILE TITLE: "Report on Contention of J.S. Anderson that his Canal Will be Too Low to Help Indians, Gila Bend Res. Aug. 1909"
LOCATION: Entry 657, Gila Bend Reservation, 1909-1916, Box 9

FILE TITLE: "Report on Preliminary Plans and Estimates, Bridge and Diversion Dam, Gila Bend Ariz. by C.R. Olberg, Oct., 1916"
LOCATION: Entry 657, Gila Bend Reservation, 1909-1916, Box 9

FILE TITLE: "Report on Underground Water Investigations Near Maricopa, Arizona, October, 1914."
LOCATION: Classified Files, 1907-1939, Pima, 2868-16-341 Pts. 6 to 8

FILE TITLE: "Report on Water Available for Irrigation from Florence and Sacaton Dams. By C.R. Olberg, Apr. 4, 1917"
LOCATION: Entry 657, Ashurst Hayden Dam and Florence Dam, 1916-22, Box 24

FILE TITLE: "Report on the Irrigation Investigation for the Benefit of the Pima and Other Indians on the Gila River Indians Res. Ariz., 1896"
LOCATION: Entry 657, Gila River Project, 1906-1940, Box 16

FILE TITLE: "Resume of Irrigation Conditions End of Fiscal Year 1914, June 30, 1914"
LOCATION: Entry 655, Box 29

FILE TITLE: "616 16657-1913 San Carlos 377"
LOCATION: Entry 121, San Carlos, Box 35469-10-375 to 14724-15-410

FILE TITLE: "616 36109-1909 (Pt. 4) 371"
LOCATION: Entry 121, San Carlos, Box 94509-07-352 to 36109-09-371 Pt. 4

FILE TITLE: "Gila River 1905"
LOCATION: Entry 653, District 4, Box 82

FILE TITLE: "Gila River 1906"
LOCATION: Entry 653, District 4, Box 82

FILE TITLE: "Gila River 1908"
LOCATION: Entry 653, District 4, Box 82

FILE TITLE: "History of Irrigation, Gila River Indian Reservation, Arizona, 1916"
LOCATION: Entry 657, Papago Reservation, 1913-17, Box 30

FILE TITLE: "Irrigation Conditions San Carlos Indian Reservation, June 30, 1909, Two Maps accompany"
LOCATION: Entry 121, San Carlos, Box 56874-35-339 - 20521-14-341

FILE TITLE: "Proposed Diversion Weir and Bridge Across the Gila River, Gila River Indian Reservation, Ariz., November, 1914, Volume I"
LOCATION: Entry 657, Gila River Project, 1906-1940, Box 15

FILE TITLE: "Report on Irrigation, Pima Indian Lands, Containing Preliminary Plans and Est. of Costs, by W.H. Code and J.J. Granville, April, 1906"
LOCATION: Entry 657, Gila River Project, 1906-1940, Box 14

FILE TITLE: "Report on Surface Flow of Gila at Damsite of S. Gila Canal Co., 1904"
LOCATION: Entry 657, Salt River-Verde, Box 48

FILE TITLE: "Soil Survey of the Middle Gila Valley Area, Arizona, by E.C. Eckmann, Mark Baldwin, and E.J. Carpenter, 1920"
LOCATION: Entry 657, Gila River Project, 1906-1940, Box 14

COLLECTION: RG 49, U.S. General Land Office
Serial Land Patent Files

FILE TITLE: Cash Entry Patent File 1134, Benjamin L. Rodgers
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 1396, Arthur Wood
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 1464, Frank B. Griffith
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 595, Charles Baker
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 608, Frederick B. Southworth
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 656, Charles C. Maag
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 710, Jacob E. Nelson
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 722, William P. Teel
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 746, Leonidas Beatty
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 753, Charles C. Stowe

LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 764, Andrew Magnus Runsick
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 769, Thomas A. Jordan
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 784, Fort Snider
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 793, Theodore D. Teal
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 869, Norton Marshall
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 876, Isaac Rudisill
LOCATION: Serial Land Patents

FILE TITLE: Cash Entry Patent File 970, Thomas A. Fulton
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent 1136359, Kenneth K. Surber
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent 395, Elizabeth W. Barney
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent 426, Joseph H. Godfrey
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent 774552, Eliza Turner Bell
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 1033448, James Thorpe
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 1134685, David R. Hefley
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 1141999, Howard William Bourland
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 1168161, Ira G. Greenwood
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 154 1/4 (1033448), James H. Brown
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 311, William W. Low
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 359, William R. Cluness
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 360, Lafayette B. Clark
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 427, John H. Shanssey
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 432, Christopher Horner
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 437, John R. Marable
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 494, Bruce Barney
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 499, Andrew Fomberg
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 541, Joseph Edwin Davis
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 546, Mary H. Wham
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 666961, W.A. Comer
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 669, John K. Wood
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Entry Patent File 726990, Marion A. Peterson
LOCATION: Serial Land Patents

FILE TITLE: Desert Land Patent File 1154409, Eula P. Greenwood
LOCATION: Serial Land Patents

FILE TITLE: Forest Lieu Selection Patent File 7376, Edward B. Perrin
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent 1054412, Benjamin F. Moore
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent 1453, Nelson Griffith
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 1008, Charley Hazelton
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 1009, Carter Hazelton
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 1014, William Burch
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 1071005 (Previously 137246), Mary Allison (Guy Morgan)
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 1071855, Walter R. Ford
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 1072938, Walter R. Ford
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 1087, Jane H. Narramore
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 1133, Noah C. Nelson
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 1208, Walter J. Wood
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 249, Patrick Kelley
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 324, Charles W. Hackett
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 346351, Thomas B. Thedford
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 373, William J. Johns
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 400, Wilbur H. Phillips
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 436, Jennie Cameron
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 486, Francisco Toledo
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 552403, James D. Collins
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 556, Edward A. Stout
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 567610, Lewis S. Streit
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 585, Henry H. McPhaul
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 660, Herbert Morgan
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 661, William Morgan
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 702, John B. Martin
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 824, Elias F. Snider
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 89, Conception Armenta
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 941526, Robert W. Peirce
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 942, Willard A. Bondurant
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 954, Thomas W. Underhill

LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 956, Daniel B. Morris
LOCATION: Serial Land Patents

FILE TITLE: Homestead Entry Patent File 999752, Edward F. Holland
LOCATION: Serial Land Patents

FILE TITLE: Public Sale Patent File 1140493, Ben Harrelson
LOCATION: Serial Land Patents

FILE TITLE: Taylor Grazing Act Patent File 1113357, Palmer Dysart
LOCATION: Serial Land Patents

FILE TITLE: Taylor Grazing Act Patent File 1118955, C.W. Davis
LOCATION: Serial Land Patents

FILE TITLE: Taylor Grazing Act Patent File 1123260
LOCATION: Serial Land Patents

FILE TITLE: Taylor Grazing Act Patent File 1128592
LOCATION: Serial Land Patents

Other General Land Office Records:

FILE TITLE: Anderson Canal, Land, and Stock Co.
LOCATION: Entry 572, Division "F" New Canal and Reservoir Files, Box 3

FILE TITLE: Antelope Valley Co.
LOCATION: Entry 572, Division "F" New Canal and Reservoir Files, Box 3

FILE TITLE: Arizona Enterprise Land and Water Company
LOCATION: Entry 572, Division "F" New Canal and Reservoir Files, Box 58

FILE TITLE: Arizona, Gila Land & Water Co.
LOCATION: Division "F" New Canal and Reservoir Files, 1908-1922, Box 68

FILE TITLE: Arizona, Gila Land and Cattle Co.
LOCATION: Division "F" New Canal and Reservoir Files, 1908-1922, Box 68

FILE TITLE: Buckeye Irrigation Company
LOCATION: Entry 572, Division "F" New Canal and Reservoir Files, Box 23

FILE TITLE: James Bent Irrigation Company
LOCATION: Entry 572, Division "F" New Canal and Reservoir Files, Box 95

FILE TITLE: "Gila Bend Reservoir and Irrigation Company"
LOCATION: Entry 569, Old Canal & Reservoir Files, Box 5

FILE TITLE: Fort Yuma
LOCATION: Entry 690, Division K, Abandoned Military Reservations File, Box 19

FILE TITLE: Gila Water Co.
LOCATION: Entry 569, Old Canal and Reservoir Files, Box 58

FILE TITLE: Mohawk Canal and Improvement Co.
LOCATION: Entry 569, Old Canal & Reservoir Files, Box 17

FILE TITLE: Mohawk Municipal Water Conservation District
LOCATION: Entry 572, New Canal & Reservoir Files, 1908-1922, Box 121

FILE TITLE: New Dendora Canal Co.
LOCATION: Entry 572, New Canal & Reservoir Files, 1908-1922, Box 132

FILE TITLE: Southside Irrigation District
LOCATION: Entry 572, New Canal & Reservoir Files, 1908-1922, Box 178

D. U.S. NATIONAL ARCHIVES II, COLLEGE PARK, MARYLAND

COLLECTION: RG 22, U.S. Fish and Wildlife Service

COLLECTION: Records of the Division of River Basin Studies
FILE TITLE: "Gila, 7148-6160"
LOCATION: Entry 261, Box 201

COLLECTION: RG 48, U.S. Secretary of the Interior

COLLECTION: Records of the Division of Water and Power
FILE TITLE: Gila River
LOCATION: Entry 867, Reports Concerning River Basin & Reclamation Projects, 1941-50, Box No. 16

COLLECTION: Records of the Division of Water and Power
FILE TITLE: Gila River
LOCATION: Entry 867, Reports Concerning River Basin & Reclamation Projects, 1941-50

COLLECTION: Records of the Office of Explorations and Surveys
FILE TITLE: "Lieut. J.C. Ives to Capt. Humphreys - Report Upon Navigable Portion of Colorado River, March 23, 1858"
LOCATION: Entry 726, Miscellaneous Records, 1859-end, Box 2

FILE TITLE: #115, Concerning Allotments made on the Gila Bend Reservation, and the Problem of White Settlers on the Reservation, 1896
LOCATION: Entry 662, Miscellaneous Records, 1838-1905, Box 2

COLLECTION: RG 57, Records of the U.S. Geological Survey

FILE TITLE: File 2184
LOCATION: Entry 369, Conservation Division, Water and Power Branch, Records Concerning Land and Stream Classification, 1900-61

COLLECTION: Wheeler Survey
FILE TITLE: Progress Report upon Geographical and Geological Explorations and Surveys West of the 100th Meridian in 1872...
LOCATION: Entry 20, Report on Wheeler Survey in 1872, Box 1

COLLECTION: RG 76, Records of Boundary and Claims Commissions and Arbitrations

FILE TITLE: Entry 399, Letters Sent by the U.S. Commissioner, 1848-58, Emory
LOCATION: U.S.-Mexican Border, Box 2

FILE TITLE: Entry 424, file 2 of 6
LOCATION: U.S.-Mexican Border, Box 6

FILE TITLE: Entry 424, file 5 of 6
LOCATION: U.S.-Mexican Border, Box 6

FILE TITLE: Entry 424, file 6 of 6
LOCATION: U.S.-Mexican Border, Box 6

E. U.S. NATIONAL ARCHIVES, SOUTHWEST REGION, LAGUNA NIGUEL

COLLECTION: RG 75, U.S. Bureau of Indian Affairs

FILE TITLE: F 44 Claims & Complaints 1-33
LOCATION: Pima Indian Agency, Subject Files of the Superintendent, Frank Thackery, 1911-1913 F40-F47, Box 24

FILE TITLE: "15307, 1916 Pima 341"
LOCATION: Entry 121, Pima, decimal 341, box 2868-16-341 Pt. 9 to 49718-18-341 Pt. 1

FILE TITLE: "16721-10-Pima 341 (With Part 5) Report on Upper Gila River"
LOCATION: Entry 121, Pima, decimal 341, box 16721-10-341 Pt. 5 to 16721-10-341 Pt. 6

FILE TITLE: "341 1912 Pima"
LOCATION: Entry 121, Pima, decimal 341, box 80245-11-341 to 107884-13-341

F. U.S. BUREAU OF LAND MANAGEMENT, PHOENIX

FILE TITLE: Master Title Plat and Historical Index for Township 1 South, Range 1 East

FILE TITLE: Master Title Plat and Historical Index for Township 1 South, Range 2 West

FILE TITLE: Master Title Plat and Historical Index for Township 1 South, Range 1 West

FILE TITLE: Master Title Plat and Historical Index for Township 1 North, Range 1 West

FILE TITLE: Master Title Plat and Historical Index for Township 1 North, Range 2 West

FILE TITLE: Master Title Plat and Historical Index for Township 1 South, Range 3 West

FILE TITLE: Master Title Plat and Historical Index for Township 1 South, Range 4 West

FILE TITLE: Master Title Plat and Historical Index for Township 1 South, Range 5 West

FILE TITLE: Master Title Plat and Historical Index for Township 2 South, Range 5 West

FILE TITLE: Master Title Plat and Historical Index for Township 3 South, Range 4 West

FILE TITLE: Master Title Plat and Historical Index for Township 3 South, Range 5 West

FILE TITLE: Master Title Plat and Historical Index for Township 4 South, 8 West

FILE TITLE: Master Title Plat and Historical Index for Township 4 South, Range 4 West

FILE TITLE: Master Title Plat and Historical Index for Township 4 South, Range 5 West

FILE TITLE: Master Title Plat and Historical Index for Township 4 South, Range 6 West

FILE TITLE: Master Title Plat and Historical Index for Township 4 South, Range 7 West

FILE TITLE: Master Title Plat and Historical Index for Township 5 South, Range 4 West

FILE TITLE: Master Title Plat and Historical Index for Township 5 South, Range 5 West

FILE TITLE: Master Title Plat and Historical Index for Township 5 South, Range 6 West

FILE TITLE: Master Title Plat and Historical Index for Township 5 South, Range 7 West

FILE TITLE: Master Title Plat and Historical Index for Township 5 South, Range 8 West

FILE TITLE: Master Title Plat and Historical Index for Township 5 South, Range 9 West

FILE TITLE: Master Title Plat and Historical Index for Township 5 South, Range 10 West

FILE TITLE: Master Title Plat and Historical Index for Township 5 South, Range 11 West

FILE TITLE: Master Title Plat and Historical Index for Township 6 South, Range 11 West

FILE TITLE: Master Title Plat and Historical Index for Township 6 South, Range 12 West

FILE TITLE: Master Title Plat and Historical Index for Township 6 South, Range 13 West

FILE TITLE: Master Title Plat and Historical Index for Township 7 South, Range 13 West

FILE TITLE: Master Title Plat and Historical Index for Township 7 South, Range 14 West

FILE TITLE: Master Title Plat and Historical Index for Township 7 South, Range 15 West

FILE TITLE: Master Title Plat and Historical Index for Township 7 South, Range 16 West

FILE TITLE: Master Title Plat and Historical Index for Township 8 South, 22 West

FILE TITLE: Master Title Plat and Historical Index for Township 8 South, Range 16 West

FILE TITLE: Master Title Plat and Historical Index for Township 8 South, Range 17 West

FILE TITLE: Master Title Plat and Historical Index for Township 8 South, Range 18 West

FILE TITLE: Master Title Plat and Historical Index for Township 8 South, Range 19 West

FILE TITLE: Master Title Plat and Historical Index for Township 8 South, Range 20 West

FILE TITLE: Master Title Plat and Historical Index for Township 8 South, Range 21 West

FILE TITLE: Master Title Plat and Historical Index for Township 9 South, Range 19 West

COLLECTION: U.S. General Land Office

FILE TITLE: Exterior Survey Plats for the Gila River

COLLECTION: U.S. General Land Office
FILE TITLE: Survey Plats for Township 1 North, Range 1 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 1 South, Range 1 East

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 1 South, Range 2 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 1 South, Range 3 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 1 South, Range 4 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 1 South, Range 5 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 2 South, Range 5 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 3 South, Range 4 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 3 South, Range 5 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 4 South, Range 4 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 4 South, Range 5 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 4 South, Range 6 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 4 South, Range 7 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 5 South, Range 11 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 5 South, Range 4 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 5 South, Range 5 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 5 South, Range 6 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 5 South, Range 7 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 7 South, Range 16 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 8 South, Range 16 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 8 South, Range 17 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 8 South, Range 18 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 8 South, Range 19 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 8 South, Range 20 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 8 South, Range 21 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 8 South, Range 22 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 9 South, Range 19 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 9 south, Range 20 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 4 South, Range 8 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 5 South, Range 10 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 5 South, Range 8 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 5 South, Range 9 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats

FILE TITLE: Township 6 South, 11 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 6 South, Range 12 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 6 South, Range 13 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 7 South, Range 13 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 7 South, Range 14 West

COLLECTION: U.S. General Land Office, Field Notes and Survey Plats
FILE TITLE: Township 7 South, Range 15 West

FILE TITLE: Tract Book for Township 1 South, Range 1 East

FILE TITLE: Tract Book for Township 1 South, Range 2 West

FILE TITLE: Tract Book for Township 1 South, Range 3 West

FILE TITLE: Tract Book for Township 1 South, Range 4 West

FILE TITLE: Tract Book for Township 1 South, Range 5 West

FILE TITLE: Tract Book for Township 2 South, Range 5 West

FILE TITLE: Tract Book for Township 3 North, Range 7 East

FILE TITLE: Tract Book for Township 3 South, Range 4 West

FILE TITLE: Tract Book for Township 3 South, Range 5 West

FILE TITLE: Tract Book for Township 4 South, Range 4 West

FILE TITLE: Tract Book for Township 4 South, Range 5 West

FILE TITLE: Tract Book for Township 4 South, Range 6 West

FILE TITLE: Tract Book for Township 4 South, Range 7 West

FILE TITLE: Tract Book for Township 4 South, Range 8 West

FILE TITLE: Tract Book for Township 5 North, Range 7 East

FILE TITLE: Tract Book for Township 5 South, Range 10 West

FILE TITLE: Tract Book for Township 5 South, Range 11 West

FILE TITLE: Tract Book for Township 5 South, Range 4 West

FILE TITLE: Tract Book for Township 5 South, Range 5 West

FILE TITLE: Tract Book for Township 5 South, Range 6 West

FILE TITLE: Tract Book for Township 5 South, Range 7 West

FILE TITLE: Tract Book for Township 5 South, Range 8 West

FILE TITLE: Tract Book for Township 5 South, Range 9 West

FILE TITLE: Tract Book for Township 6 South, Range 11 West

FILE TITLE: Tract Book for Township 6 South, Range 12 West

FILE TITLE: Tract Book for Township 6 South, Range 13 West

FILE TITLE: Tract Book for Township 7 South, Range 13 West

FILE TITLE: Tract Book for Township 7 South, Range 14 West

FILE TITLE: Tract Book for Township 7 South, Range 15 West

FILE TITLE: Tract Book for Township 7 South, Range 16 West

FILE TITLE: Tract Book for Township 8 South, Range 16 West

FILE TITLE: Tract Book for Township 8 South, Range 17 West

FILE TITLE: Tract Book for Township 8 South, Range 18 West

FILE TITLE: Tract Book for Township 8 South, Range 19 West

FILE TITLE: Tract Book for Township 8 South, Range 20 West

FILE TITLE: Tract Book for Township 8 South, Range 21 West

FILE TITLE: Tract Book for Township 8 South, Range 22 West

FILE TITLE: Tract Book for Township 9 South, Range 19 West

FILE TITLE: Tract Book for Township 9 South, Range 20 West

FILE TITLE: Tract Books on Microfilm for Gila and Verde River Townships

G. WATER RESOURCES CENTER ARCHIVES, BERKELEY

COLLECTION: James Dix Schuyler

FILE TITLE: Report of James D. Schuyler, Consulting Engineer, on the General Conditions and Cost of Water Storage for Irrigation on the Gila River, Arizona, for the Benefit of the Indians Occupying the Gila River Reservation
LOCATION: Item 130

FILE TITLE: Report on the Water Supply of the Agua Fria River and the Storage Reservoir Project of the Agua Fria Water and Land Company for Irrigation in the Gila River Valley, Arizona
LOCATION: Item 139

COLLECTION: Joseph Barlow Lippincott

FILE TITLE: Report on the Buckeye Irrigation Co's. Proposed Weir Gila River Maricopa Co. Arizona, Buckeye Valley
LOCATION: Box II, Item 6, volume 4

FILE TITLE: Report on the Buckeye Irrigation Co's. Proposed Weir Gila River Maricopa Co. Arizona, Hydrographic Section
LOCATION: Box II, Item 6, volume 2

COLLECTION: Photographs
FILE TITLE: Gila River Photographs, originals

APPENDIX C – FEDERAL AND STATE PATENTS

A. FEDERAL PATENTS

LOCATION: Township 1 S, Range 1 W, Section 1
PATENT NUMBER: DLE, 1111609
PATENT DATE: 07/09/1941

LOCATION: Township 1 S, Range 1 W, Section 1
PATENT NUMBER: HE, 810317
PATENT DATE: 06/16/1921

LOCATION: Township 1 S, Range 1 W, Section 3
PATENT NUMBER: DLE, 1154408
PATENT DATE: 09/20/1955

LOCATION: Township 1 S, Range 1 W, Section 3
PATENT NUMBER: HE, 830675
PATENT DATE: 11/02/1921

LOCATION: Township 1 S, Range 1 W, Section 3
PATENT NUMBER: DLE, 925887
PATENT DATE: 12/07/1923

LOCATION: Township 1 N, Range 1 W, Section 28
PATENT NUMBER: HE, 344256
PATENT DATE: 06/13/1937
PATENTEE: Henry A. Hammels

LOCATION: Township 1 N, Range 1 W, Section 29
PATENT NUMBER: IND RES X PAT, 505219
PATENT DATE: 12/30/1915

LOCATION: Township 1 N, Range 1 W, Section 29
PATENT NUMBER: HE, 625
PATENT DATE: 11/21/1894
PATENTEE: Eugene B. Richardson

LOCATION: Township 1 N, Range 1 W, Section 30
PATENT NUMBER: IND RES X PAT, 505219
PATENT DATE: 12/30/1915

LOCATION: Township 1 N, Range 1 W, Section 31
PATENT NUMBER: In Lieu, 47
PATENT DATE: 01/05/1922

LOCATION: Township 1 N, Range 1 W, Section 33
PATENT NUMBER: CE, 1123764
PATENT DATE: 08/17/1948
PATENTEE: Buckeye Irrigation Co.

LOCATION: Township 1 N, Range 1 W, Section 33
PATENT NUMBER: PS, 1151737
PATENT DATE: 04/21/1955

LOCATION: Township 1 N, Range 1 W, Section 33
PATENT NUMBER: SS, 18
PATENT DATE: 02/28/1919

LOCATION: Township 1 N, Range 1 W, Section 34
PATENT NUMBER: HE, 1070902
PATENT DATE: 07/18/1934
PATENTEE: Earl Ardy Watts

LOCATION: Township 1 N, Range 1 W, Section 34
PATENT NUMBER: HE, 1411
PATENT DATE: 11/24/1905
PATENTEE: Victoriano Perez

LOCATION: Township 1 N, Range 1 W, Section 34
PATENT NUMBER: HE, 58881
PATENT DATE: 05/04/1909
PATENTEE: Ramon Ruiz

LOCATION: Township 1 N, Range 1 W, Section 34
PATENT NUMBER: CE, 762971
PATENT DATE: 07/19/1920

LOCATION: Township 1 N, Range 1 W, Section 34
PATENT NUMBER: HE, 830677
PATENT DATE: 11/02/1921

LOCATION: Township 1 N, Range 1 W, Section 35
PATENT NUMBER: CE, 1143
PATENT DATE: 04/23/1896
PATENTEE: Hugh Monagham

LOCATION: Township 1 N, Range 1 W, Section 35
PATENT NUMBER: HE, 1331
PATENT DATE: 03/30/1905
PATENTEE: James Holmer

LOCATION: Township 1 S, Range 2 W, Section 3
PATENT NUMBER: HE, 942
PATENT DATE: 06/28/1899
PATENTEE: Willard A. Bondurant

LOCATION: Township 1 S, Range 2 W, Section 4
PATENT NUMBER: Cur. HE, 1118089
PATENT DATE: 03/01/1944
PATENTEE: Henry A. and Mabel S Hammels

LOCATION: Township 1 S, Range 2 W, Section 4
PATENT NUMBER: DLE, 1154409
PATENT DATE: 09/20/1955
PATENTEE: Eula P. Greenwood

LOCATION: Township 1 S, Range 2 W, Section 4
PATENT NUMBER: DLE, 1168161
PATENT DATE: 01/08/1957
PATENTEE: Ira G. Greenwood

LOCATION: Township 1 S, Range 2 W, Section 4
PATENT NUMBER: CE Pat., 154 1/4
PATENT DATE: 12/01/1891
PATENTEE: James H. Brown

LOCATION: Township 1 S, Range 2 W, Section 4
PATENT NUMBER: CE, 284
PATENT DATE: 10/08/1891
PATENTEE: Eugene Jackson

LOCATION: Township 1 S, Range 2 W, Section 4
PATENT NUMBER: HE, 545
PATENT DATE: 12/20/1892
PATENTEE: Abraham Charlton

LOCATION: Township 1 S, Range 2 W, Section 4
PATENT NUMBER: CE, 668
PATENT DATE: 03/28/1903
PATENTEE:

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Curative Pat., 02-76-0013
PATENT DATE: 12/03/1975
PATENTEE: Antonio & Antonia Gonzales

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Curative Pat., 02-76-0014
PATENT DATE: 12/03/1975
PATENTEE: Manuel & Alberta Espinosa

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Curative Pat., 02-76-0020
PATENT DATE: 12/03/1975
PATENTEE: Alberto & Emilia Castaneda

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Curative Pat., 02-76-0021
PATENT DATE: 12/03/1975
PATENTEE: Thomas C. & Lupe R. Perez

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Curative Pat., 02-76-0022
PATENT DATE: 12/03/1975
PATENTEE: Sa Prvulov

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Curative Pat., 02-76-0035
PATENT DATE: 06/23/1976
PATENTEE: Hijinio Lopez

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Curative Pat., 02-76-0036
PATENT DATE: 07/21/1976
PATENTEE: Vicenta L. Alvarez

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Curative Pat., 02-77-0001
PATENT DATE: 12/07/1976
PATENTEE: Rafael Alvarez

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Cur. TC Pat., 1010387
PATENT DATE: 12/27/1927
PATENTEE: Investment Company Dwight B. Heard

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: Cur. CE, 1033448
PATENT DATE: 01/03/1930
PATENTEE: James R. Thorpe

LOCATION: Township 1 S, Range 2 W, Section 5

PATENT NUMBER: TC Pat., 16
PATENT DATE: 02/16/1895
PATENTEE: William R. Beloat

LOCATION: Township 1 S, Range 2 W, Section 5
PATENT NUMBER: CE, 258
PATENT DATE: 06/30/1892
PATENTEE: Joshua L. Spain

LOCATION: Township 1 S, Range 2 W, Section 7
PATENT NUMBER: HE, 1036618
PATENT DATE: 04/28/1930

LOCATION: Township 1 S, Range 2 W, Section 7
PATENT NUMBER: HE Pat., 1042
PATENT DATE: 05/08/1901
PATENTEE: William McDonald

LOCATION: Township 1 S, Range 2 W, Section 7
PATENT NUMBER: HE Pat., 1071855
PATENT DATE: 09/05/1934
PATENTEE: Walter R. Ford

LOCATION: Township 1 S, Range 2 W, Section 7
PATENT NUMBER: HE Pat., 1072938
PATENT DATE: 10/31/1934
PATENTEE: Walter R. Ford

LOCATION: Township 1 S, Range 2 W, Section 7
PATENT NUMBER: DLE, 1134685
PATENT DATE: 04/29/1952
PATENTEE: David R. Hefley

LOCATION: Township 1 S, Range 2 W, Section 7
PATENT NUMBER: Cur. HE Pat., 911357
PATENT DATE: 07/09/1923
PATENTEE: William R. McDonald

LOCATION: Township 1 S, Range 2 W, Section 7
PATENT NUMBER: Cur. HE, 911357
PATENT DATE: 07/09/1923

LOCATION: Township 1 S, Range 2 W, Section 7
PATENT NUMBER: HE, 942273
PATENT DATE: 08/01/1924

LOCATION: Township 1 S, Range 2 W, Section 8
PATENT NUMBER: Cur. CE Pat., 1071005
PATENT DATE: 07/18/1934
PATENTEE: Mary E. Allison

LOCATION: Township 1 S, Range 2 W, Section 8
PATENT NUMBER: SX, 1128592
PATENT DATE: 03/30/1950
PATENTEE: State of Arizona

LOCATION: Township 1 S, Range 2 W, Section 8
PATENT NUMBER: HE Pat., 1319
PATENT DATE: 07/27/1904
PATENTEE: Edward Brewster

LOCATION: Township 1 S, Range 2 W, Section 8
PATENT NUMBER: CE Pat., 137246
PATENT DATE: 06/16/1910
PATENTEE: Guy F. Morgan

LOCATION: Township 1 S, Range 2 W, Section 8
PATENT NUMBER: SS Deaf, Dumb, 7
PATENT DATE: 02/07/1921
PATENTEE: State of Arizona

LOCATION: Township 1 N, Range 2 W, Section 25
PATENT NUMBER: CE, 233230
PATENT DATE: 11/09/1911

LOCATION: Township 1 N, Range 2 W, Section 25
PATENT NUMBER: CE, 265029
PATENT DATE: 05/09/1912

LOCATION: Township 1 N, Range 2 W, Section 25
PATENT NUMBER: CE, 814694
PATENT DATE: 07/18/1921

LOCATION: Township 1 N, Range 2 W, Section 26
PATENT NUMBER: CE, 178376
PATENT DATE: 02/16/1911

LOCATION: Township 1 N, Range 2 W, Section 26
PATENT NUMBER: CE, 280872
PATENT DATE: 06/27/1912

LOCATION: Township 1 N, Range 2 W, Section 26

PATENT NUMBER: CE, 513101
PATENT DATE: 02/12/1916

LOCATION: Township 1 N, Range 2 W, Section 26
PATENT NUMBER: HE, 527
PATENT DATE: 10/15/1892

LOCATION: Township 1 N, Range 2 W, Section 27
PATENT NUMBER: CE, 289506
PATENT DATE: 08/26/1912

LOCATION: Township 1 N, Range 2 W, Section 33
PATENT NUMBER: HE, 657
PATENT DATE: 11/22/1894

LOCATION: Township 1 N, Range 2 W, Section 34
PATENT NUMBER: CE, 173 3/4
PATENT DATE: 08/08/1892

LOCATION: Township 1 N, Range 2 W, Section 34
PATENT NUMBER: CE, 475
PATENT DATE: 04/25/1894

LOCATION: Township 1 N, Range 2 W, Section 34
PATENT NUMBER: HE, 936943
PATENT DATE: 04/24/1924
PATENTEE: Refugio Saldate

LOCATION: Township 1 N, Range 2 W, Section 34
PATENT NUMBER: HE, 942
PATENT DATE: 06/28/1899
PATENTEE: Willard A. Bondurant

LOCATION: Township 1 N, Range 2 W, Section 35
PATENT NUMBER: HE, 1101664
PATENT DATE: 03/14/1939
PATENTEE: Henry L. Magby

LOCATION: Township 1 N, Range 2 W, Section 35
PATENT NUMBER: PS, 1153351
PATENT DATE: 08/08/1955
PATENTEE: Clarence L. Reidhead

LOCATION: Township 1 N, Range 2 W, Section 35
PATENT NUMBER: In Lieu, 247
PATENT DATE: 06/30/1958

PATENTEE: State of Arizona

LOCATION: Township 1 N, Range 2 W, Section 35
PATENT NUMBER: CE, 276689
PATENT DATE: 06/18/1912

LOCATION: Township 1 N, Range 2 W, Section 35
PATENT NUMBER: CE, 532042
PATENT DATE: 06/03/1916
PATENTEE: Jeff Viliborghi

LOCATION: Township 1 N, Range 2 W, Section 35
PATENT NUMBER: In Lieu, 80
PATENT DATE: 03/29/1929

LOCATION: Township 1 S, Range 3 W, Section 7
PATENT NUMBER: HE, 1453
PATENT DATE: 02/28/1906
PATENTEE: Nelson Griffith

LOCATION: Township 1 S, Range 3 W, Section 7
PATENT NUMBER: CE, 1464
PATENT DATE: 03/29/1902
PATENTEE: B. Frank Griffith

LOCATION: Township 1 S, Range 3 W, Section 8
PATENT NUMBER: SX, 1123260
PATENT DATE: 02/19/1948
PATENTEE: State of Arizona

LOCATION: Township 1 S, Range 3 W, Section 8
PATENT NUMBER: HE, 402994
PATENT DATE: 05/06/1914
PATENTEE: Edward J. Downing

LOCATION: Township 1 S, Range 3 W, Section 11
PATENT NUMBER: HE Pat., 1014
PATENT DATE: 09/07/1900
PATENTEE: William Burch

LOCATION: Township 1 S, Range 3 W, Section 11
PATENT NUMBER: DLE, 1126843
PATENT DATE: 07/25/1949

LOCATION: Township 1 S, Range 3 W, Section 11
PATENT NUMBER: DLE Pat., 1141999

PATENT DATE: 12/15/1953
PATENTEE: Edward William Bourland

LOCATION: Township 1 S, Range 3 W, Section 12
PATENT NUMBER: HE Pat., 1008
PATENT DATE: 06/11/1900
PATENTEE: Charley Hazelton

LOCATION: Township 1 S, Range 3 W, Section 12
PATENT NUMBER: HE Pat., 1009
PATENT DATE: 06/11/1900
PATENTEE: Carlos Hazelton

LOCATION: Township 1 S, Range 3 W, Section 12
PATENT NUMBER: HE, 1087570
PATENT DATE: 12/18/1936

LOCATION: Township 1 S, Range 3 W, Section 12
PATENT NUMBER: HE Pat., 1103029
PATENT DATE: 06/09/1939
PATENTEE: Samuel James Smith

LOCATION: Township 1 S, Range 3 W, Section 12
PATENT NUMBER: R/W MAT. SITE, PHX 084208
PATENT DATE: 03/18/1949

LOCATION: Township 1 S, Range 3 W, Section 13
PATENT NUMBER: Act of Cong Pat, 1073560
PATENT DATE: 12/22/1934

LOCATION: Township 1 S, Range 3 W, Section 14
PATENT NUMBER: CE Pat., 346351
PATENT DATE: 07/12/1913
PATENTEE: Thomas B. Thedford

LOCATION: Township 1 S, Range 3 W, Section 15
PATENT NUMBER: HE, 1100226
PATENT DATE: 12/02/1938
PATENTEE: Jim Warn

LOCATION: Township 1 S, Range 3 W, Section 15
PATENT NUMBER: PX Pat, 1113357
PATENT DATE: 03/09/1942
PATENTEE: Palmer Dysart

LOCATION: Township 1 S, Range 3 W, Section 15

PATENT NUMBER: DLE Pat., 666867
PATENT DATE: 02/19/1919
PATENTEE: Robert S. Gills

LOCATION: Township 1 S, Range 3 W, Section 17
PATENT NUMBER: HE, 524339
PATENT DATE: 04/13/1916
PATENTEE: Thomas Hastie Bell

LOCATION: Township 1 S, Range 3 W, Section 17
PATENT NUMBER: DLE, 774552
PATENT DATE: 09/23/1920
PATENTEE: Charles, heirs of Turner

LOCATION: Township 1 S, Range 3 W, Section 18
PATENT NUMBER: HE, 1107503
PATENT DATE: 03/27/1940
PATENTEE: William M. Calthorp

LOCATION: Township 1 S, Range 3 W, Section 18
PATENT NUMBER: IN LIEU, 55
PATENT DATE: 03/22/1922
PATENTEE: State of Arizona

LOCATION: Township 1 S, Range 4 W, Section 14
PATENT NUMBER: IND RES X PAT, 1060996
PATENT DATE: 01/19/1933

LOCATION: Township 1 S, Range 4 W, Section 14
PATENT NUMBER: SS, 29
PATENT DATE: 09/01/1925

LOCATION: Township 1 S, Range 4 W, Section 14
PATENT NUMBER: CE, 500
PATENT DATE: 12/19/1894

LOCATION: Township 1 S, Range 4 W, Section 19
PATENT NUMBER: CE, 1362
PATENT DATE: 09/30/1899

LOCATION: Township 1 S, Range 4 W, Section 19
PATENT NUMBER: HE, 810319
PATENT DATE: 06/16/1921

LOCATION: Township 1 S, Range 4 W, Section 20
PATENT NUMBER: HE, 1066211

PATENT DATE: 09/22/1933

LOCATION: Township 1 S, Range 4 W, Section 20
PATENT NUMBER: SS, 12
PATENT DATE: 10/22/1917

LOCATION: Township 1 S, Range 4 W, Section 20
PATENT NUMBER: HE, 602230
PATENT DATE: 09/29/1917

LOCATION: Township 1 S, Range 4 W, Section 20
PATENT NUMBER: CE, 882
PATENT DATE: 01/25/1892
PATENTEE:

LOCATION: Township 1 S, Range 4 W, Section 20
PATENT NUMBER: HE, 902
PATENT DATE: 04/01/1899
PATENTEE:

LOCATION: Township 1 S, Range 4 W, Section 21
PATENT NUMBER: CE, 342345
PATENT DATE: 06/19/1913
PATENTEE:

LOCATION: Township 1 S, Range 4 W, Section 22
PATENT NUMBER: HE, 523517
PATENT DATE: 04/08/1916
PATENTEE: Ellice W. Minor

LOCATION: Township 1 S, Range 4 W, Section 22
PATENT NUMBER: CE, 984970
PATENT DATE: 09/09/1926
PATENTEE: David E. Anderson

LOCATION: Township 1 S, Range 4 W, Section 23
PATENT NUMBER: DLE, 680744
PATENT DATE: 06/02/1919
PATENTEE: Thomas J. Kenworthy

LOCATION: Township 1 S, Range 4 W, Section 23
PATENT NUMBER: HE, 745392
PATENT DATE: 04/16/1920
PATENTEE: Thomas Durr

LOCATION: Township 1 S, Range 4 W, Section 24

PATENT NUMBER: CE, 528502
PATENT DATE: 05/11/1916
PATENTEE: Thomas V., heirs of Coony

LOCATION: Township 1 S, Range 4 W, Section 24
PATENT NUMBER: HE, 897526
PATENT DATE: 02/27/1923
PATENTEE: Murrell E. Flood

LOCATION: Township 1 S, Range 4 W, Section 29
PATENT NUMBER: HE, 567410
PATENT DATE: 02/14/1917
PATENTEE: Juan Romo

LOCATION: Township 1 S, Range 4 W, Section 30
PATENT NUMBER: CE, 805970
PATENT DATE: 05/11/1921
PATENTEE: Jesse D. Williams

LOCATION: Township 1 S, Range 5 W, Section 25
PATENT NUMBER: SS, 2
PATENT DATE: 10/13/1930
PATENTEE: State of Arizona

LOCATION: Township 1 S, Range 5 W, Section 25
PATENT NUMBER: HE, 552403
PATENT DATE: 10/30/1916
PATENTEE: James D. Collins

LOCATION: Township 1 S, Range 5 W, Section 25
PATENT NUMBER: HE, 552418
PATENT DATE: 10/30/1916
PATENTEE: William Forbes

LOCATION: Township 1 S, Range 5 W, Section 27
PATENT NUMBER: CE, 1396
PATENT DATE: 04/09/1901
PATENTEE: Arthur C. Wood

LOCATION: Township 1 S, Range 5 W, Section 27
PATENT NUMBER: CE, 227
PATENT DATE: 11/08/1890
PATENTEE: Edward A. Torrea

LOCATION: Township 1 S, Range 5 W, Section 27
PATENT NUMBER: IN LIEU, 40

PATENT DATE: 11/26/1920
PATENTEE:

LOCATION: Township 1 S, Range 5 W, Section 27
PATENT NUMBER: DLE, 726990
PATENT DATE: 01/10/1920
PATENTEE: Marion A. Peterson

LOCATION: Township 1 S, Range 5 W, Section 33
PATENT NUMBER: HE, 1208
PATENT DATE: 03/17/1903
PATENTEE: Walter J. Wood

LOCATION: Township 1 S, Range 5 W, Section 33
PATENT NUMBER: CE, 669
PATENT DATE: 06/03/1903
PATENTEE: John K. Wood

LOCATION: Township 1 S, Range 5 W, Section 34
PATENT NUMBER: DLE, 1050259
PATENT DATE: 10/05/1931
PATENTEE: May T. Fink

LOCATION: Township 1 S, Range 5 W, Section 34
PATENT NUMBER: HE, 521583
PATENT DATE: 03/25/1916
PATENTEE:

LOCATION: Township 1 S, Range 5 W, Section 34
PATENT NUMBER: HE, 761344
PATENT DATE: 07/14/1920
PATENTEE: Lee Fred Bowser

LOCATION: Township 2 S, Range 5 W, Section 3
PATENT NUMBER: HE, 1081492
PATENT DATE: 02/25/1936
PATENTEE:

LOCATION: Township 2 S, Range 5 W, Section 4
PATENT NUMBER: SS, 2
PATENT DATE: 10/13/1930
PATENTEE: State of Arizona

LOCATION: Township 2 S, Range 5 W, Section 10
PATENT NUMBER: DLE, 1123231
PATENT DATE: 02/16/1948

PATENTEE:

LOCATION: Township 2 S, Range 5 W, Section 15
PATENT NUMBER: HE, 1071037
PATENT DATE: 07/25/1934
PATENTEE:

LOCATION: Township 2 S, Range 5 W, Section 21
PATENT NUMBER: CE, 698
PATENT DATE: 11/30/1904
PATENTEE:

LOCATION: Township 2 S, Range 5 W, Section 28
PATENT NUMBER: HE, 302129
PATENT DATE: 11/25/1912
PATENTEE:

LOCATION: Township 2 S, Range 5 W, Section 28
PATENT NUMBER: HE, 479997
PATENT DATE: 06/26/1915
PATENTEE: Frank H. Hereford

LOCATION: Township 2 S, Range 5 S, Section 28
PATENT NUMBER: CE, 579
PATENT DATE: 06/03/1891
PATENTEE:

LOCATION: Township 2 S, Range 5 W, Section 28
PATENT NUMBER: HE, 999752
PATENT DATE: 04/08/1927
PATENTEE: Edward F. Holland

LOCATION: Township 2 S, Range 5 W, Section 33
PATENT NUMBER: PX, 1118955
PATENT DATE: 09/14/1944
PATENTEE: Carroll Wiggington Davis

LOCATION: Township 2 S, Range 5 W, Section 33
PATENT NUMBER: SS, 2
PATENT DATE: 06/02/1915
PATENTEE: State of Arizona

LOCATION: Township 2 S, Range 5 W, Section 33
PATENT NUMBER: CE, 793
PATENT DATE: 01/11/1892
PATENTEE: Theodore D. Teal

LOCATION: Township 3 S, Range 4 W, Section 7
PATENT NUMBER: IND RES X PAT, 175044
PATENT DATE: 02/03/1911
PATENTEE: Santa Fe Pacific Railroad

LOCATION: Township 3 S, Range 4 W, Section 29
PATENT NUMBER: HE, 1054412
PATENT DATE: 04/12/1932
PATENTEE: Benjamin F. Moore

LOCATION: Township 3 S, Range 4 W, Section 32
PATENT NUMBER: IND RES X PAT, 505233
PATENT DATE: 12/30/1915
PATENTEE:

LOCATION: Township 3 S, Range 5 W, Section 1
PATENT NUMBER: PS, 1156702
PATENT DATE: 01/18/1956
PATENTEE: Carroll and Kathryn Davis

LOCATION: Township 3 S, Range 5 W, Section 1
PATENT NUMBER: HE, 481599
PATENT DATE: 07/07/1915
PATENTEE: Samuel Bigler

LOCATION: Township 3 S, Range 5 W, Section 12
PATENT NUMBER: PS, 1156315
PATENT DATE: 12/27/1955
PATENTEE: Perley M. Lewis

LOCATION: Township 3 S, Range 5 W, Section 18
PATENT NUMBER: PS, 11567092
PATENT DATE: 01/18/1956
PATENTEE:

LOCATION: Township 4 S, Range 4 W, Section 5
PATENT NUMBER: IND RES X PAT, 175044
PATENT DATE: 02/03/1911
PATENTEE:

LOCATION: Township 4 S, Range 4 W, Section 8
PATENT NUMBER: DLE, 1001597
PATENT DATE: 05/10/1927
PATENTEE:

LOCATION: Township 4 S, Range 4 W, Section 8
PATENT NUMBER: DLE, 1146468
PATENT DATE: 09/03/1954
PATENTEE: Lola Arlene Pierpont

LOCATION: Township 4 S, Range 4 W, Section 17
PATENT NUMBER: DLE, 1147922
PATENT DATE: 11/15/1954
PATENTEE:

LOCATION: Township 4 S, Range 4 W, Section 20
PATENT NUMBER: CE, 1066811
PATENT DATE: 11/03/1933
PATENTEE: Miller Woods

LOCATION: Township 4 S, Range 4 W, Section 20
PATENT NUMBER: CE, 1066811
PATENT DATE: 11/03/1933
PATENTEE:

LOCATION: Township 4 S, Range 4 W, Section 20
PATENT NUMBER: PS, 1088399
PATENT DATE: 02/12/1937
PATENTEE: Emil F. Jones

LOCATION: Township 4 S, Range 4 W, Section 28
PATENT NUMBER: HE, 660
PATENT DATE: 11/21/1894
PATENTEE: Herbert Morgan

LOCATION: Township 4 S, Range 4 W, Section 28
PATENT NUMBER: HE, 661
PATENT DATE: 11/22/1894
PATENTEE: William Morgan

LOCATION: Township 4 S, Range 4 W, Section 29
PATENT NUMBER: PS, 1140493
PATENT DATE: 08/25/1953
PATENTEE: Ben Harrelson

LOCATION: Township 4 S, Range 4 W, Section 33
PATENT NUMBER: HE, 373
PATENT DATE: 11/09/1891
PATENTEE: William J. Johns

LOCATION: Township 4 S, Range 6 W, Section 27

PATENT NUMBER: CE, 541
PATENT DATE: 10/23/1894
PATENTEE: Joseph Edwin Davis

LOCATION: Township 4 S, Range 6 W, Section 30
PATENT NUMBER: CE, 494
PATENT DATE: 02/08/1894
PATENTEE: Bruce Barney

LOCATION: Township 4 S, Range 6 W, Section 31
PATENT NUMBER: HE, 60411
PATENT DATE: 05/11/1909
PATENTEE: Josiah J. Anderson

LOCATION: Township 4 S, Range 6 W, Section 33
PATENT NUMBER: HE, 556
PATENT DATE: 12/20/1892
PATENTEE: Edward A. Stout

LOCATION: Township 4 S, Range 6 W, Section 33
PATENT NUMBER: HE, 562
PATENT DATE: 03/27/1893
PATENTEE: William L. Garrigus

LOCATION: Township 4 S, Range 6 W, Section 34
PATENT NUMBER: CE, 435
PATENT DATE: 03/08/1894
PATENTEE: Winfield S. Millis

LOCATION: Township 4 S, Range 6 W, Section 35
PATENT NUMBER: CE, 1134
PATENT DATE: 12/26/1895
PATENTEE: Benjamin L. Rodgers

LOCATION: Township 4 S, Range 6 W, Section 35
PATENT NUMBER: CE, 499
PATENT DATE: 08/22/1894
PATENTEE: Andrew Fomberg

LOCATION: Township 4 S, Range 7 W, Section 23
PATENT NUMBER: CE, 395
PATENT DATE: 03/21/1893
PATENTEE: Elizabeth W. Ramey

LOCATION: Township 4 S, Range 7 W, Section 34
PATENT NUMBER: HE, 670

PATENT DATE: 11/22/1894
PATENTEE: William A. Westbrook

LOCATION: Township 4 S, Range 8 W, Section 14
PATENT NUMBER: HE, 567610
PATENT DATE: 02/16/1917
PATENTEE: Lewis S. Streit

LOCATION: Township 4 S, Range 8 W, Section 15
PATENT NUMBER: HE, 567612
PATENT DATE: 02/16/1917
PATENTEE: Jesse W. Utz

LOCATION: Township 4 S, Range 8 W, Section 23
PATENT NUMBER: HE, 602244
PATENT DATE: 09/29/1917
PATENTEE: Weigand Trusheim

LOCATION: Township 4 S, Range 8 W, Section 23
PATENT NUMBER: HE, 680853
PATENT DATE: 06/02/1919
PATENTEE: Alfred Bartine

LOCATION: Township 4 S, Range 8 W, Section 26
PATENT NUMBER: HE, 434354
PATENT DATE: 10/08/1914
PATENTEE: William W. Bruner

LOCATION: Township 5 S, Range 4 W, Section 5
PATENT NUMBER: CE, 656
PATENT DATE: 01/22/1891
PATENTEE: Charles C. Maag

LOCATION: Township 5 S, Range 4 W, Section 5
PATENT NUMBER: HE, 947
PATENT DATE: 11/20/1899
PATENTEE: Charles W. Padelford

LOCATION: Township 5 S, Range 4 W, Section 7
PATENT NUMBER: CE, 656
PATENT DATE: 01/22/1891
PATENTEE:

LOCATION: Township 5 S, Range 4 W, Section 8
PATENT NUMBER: HE, 1087
PATENT DATE: 08/29/1901

PATENTEE: Jane H. Narramore

LOCATION: Township 5 S, Range 4 W, Section 8
PATENT NUMBER: CE, 746
PATENT DATE: 11/16/1891
PATENTEE: Leonidas Beatty

LOCATION: Township 5 S, Range 4 W, Section 18
PATENT NUMBER: CE, 645
PATENT DATE: 01/22/1891
PATENTEE: Ira P. Gould

LOCATION: Township 5 S, Range 6 W, Section 1
PATENT NUMBER: HE, 400
PATENT DATE: 01/11/1892
PATENTEE: Wilbur H. Phillips

LOCATION: Township 5 S, Range 6 W, Section 1
PATENT NUMBER: HE, 400
PATENT DATE: 01/11/1892
PATENTEE: Wilbur H. Phillips

LOCATION: Township 5 S, Range 6 W, Section 1
PATENT NUMBER: HE, 585
PATENT DATE: 07/06/1893
PATENTEE: Henry H. McPhaul

LOCATION: Township 5 S, Range 6 W, Section 2
PATENT NUMBER: HE, 249
PATENT DATE: 01/13/1891
PATENTEE: Patrick Kelley

LOCATION: Township 5 S, Range 6 W, Section 2
PATENT NUMBER: HE, 316
PATENT DATE: 04/27/1891
PATENTEE: WIlliam J. Welcome

LOCATION: Township 5 S, Range 8 W, Section 6
PATENT NUMBER: HE, 785777
PATENT DATE: 12/10/1920
PATENTEE: Frederick J. Kreager

LOCATION: Township 5 S, Range 9 W, Section 12
PATENT NUMBER: CE, 769
PATENT DATE: 11/09/1891
PATENTEE: Thomas A. Jordan

LOCATION: Township 5 S, Range 10 W, Section 13
PATENT NUMBER: HE, 927808
PATENT DATE: 12/28/1923
PATENTEE: Herschel B. Wright

LOCATION: Township 5 S, Range 10 W, Section 14
PATENT NUMBER: SS, 18
PATENT DATE: 02/28/1919
PATENTEE:

LOCATION: Township 5 S, Range 10 W, Section 27
PATENT NUMBER: HE, 436
PATENT DATE: 01/20/1892
PATENTEE: Jennie Cameron

LOCATION: Township 5 S, Range 10 W, Section 28
PATENT NUMBER: HE, 559
PATENT DATE: 04/08/1893
PATENTEE: Jahail Hoople

LOCATION: Township 5 S, Range 10 W, Section 29
PATENT NUMBER: HE, 518080
PATENT DATE: 03/09/1916
PATENTEE: Roman Amabisca

LOCATION: Township 5 S, Range 10 W, Section 30
PATENT NUMBER: FLS, 7376
PATENT DATE: 06/03/1904
PATENTEE: Edward B. Perrin

LOCATION: Township 5 S, Range 11 W, Section 35
PATENT NUMBER: CE, 1443
PATENT DATE: 12/12/1901
PATENTEE: William E. Brown

LOCATION: Township 5 S, Range 11 W, Section 35
PATENT NUMBER: IN LIEU, 5
PATENT DATE: 05/01/1918
PATENTEE: State of Arizona

LOCATION: Township 6 S, Range 11 W, Section 7
PATENT NUMBER: IND RES X PAT, 505222
PATENT DATE: 12/30/1915
PATENTEE: Santa Fe Pacific Railroad

LOCATION: Township 6 S, Range 11 W, Section 7
PATENT NUMBER: CE, 710
PATENT DATE: 10/16/1891
PATENTEE: Jacob E. Nelson

LOCATION: Township 6 S, Range 11 W, Section 8
PATENT NUMBER: HE, 324
PATENT DATE: 01/11/1892
PATENTEE: Charles W. Hackett

LOCATION: Township 6 S, Range 11 W, Section 9
PATENT NUMBER: HE, 966772
PATENT DATE: 09/24/1925
PATENTEE: Martin L. Howard

LOCATION: Township 6 S, Range 12 W, Section 10
PATENT NUMBER: TC, 1001698
PATENT DATE: 05/14/1927
PATENTEE: Hans Peter Johansen

LOCATION: Township 6 S, Range 12 W, Section 11
PATENT NUMBER: CE, 546
PATENT DATE: 05/10/1895
PATENTEE: Mary H. Wham

LOCATION: Township 6 S, Range 12 W, Section 12
PATENT NUMBER: HE, 702
PATENT DATE: 06/19/1895
PATENTEE: John B. Martin

LOCATION: Township 6 S, Range 12 W, Section 15
PATENT NUMBER: HE, 1059385
PATENT DATE: 11/02/1932
PATENTEE: Harold D. McDaniel

LOCATION: Township 6 S, Range 12 W, Section 15
PATENT NUMBER: HE, 3129
PATENT DATE: 04/01/1907
PATENTEE: John F. Nottbusch

LOCATION: Township 6 S, Range 12 W, Section 15
PATENT NUMBER: HE, 956
PATENT DATE: 07/26/1899
PATENTEE: Daniel B. Morris

LOCATION: Township 6 S, Range 12 W, Section 19

PATENT NUMBER: HE, 486
PATENT DATE: 05/16/1892
PATENTEE: Francisco Toledo

LOCATION: Township 6 S, Range 12 W, Section 20
PATENT NUMBER: HE, 1133
PATENT DATE: 02/12/1902
PATENTEE: Noah C. Nelson

LOCATION: Township 6 S, Range 12 W, Section 20
PATENT NUMBER: HE, 824
PATENT DATE: 11/05/1897
PATENTEE: Elias F. Snider

LOCATION: Township 6 S, Range 12 W, Section 20
PATENT NUMBER: HE, 954
PATENT DATE: 07/26/1899
PATENTEE: Thomas W. Underhill

LOCATION: Township 6 S, Range 12 W, Section 21
PATENT NUMBER: CE, 722
PATENT DATE: 10/16/1891
PATENTEE: William P. Teel

LOCATION: Township 6 S, Range 12 W, Section 30
PATENT NUMBER: HE, 1072300
PATENT DATE: 09/26/1934
PATENTEE: John R. Ross

LOCATION: Township 6 S, Range 13 W, Section 0
PATENT NUMBER: IND RES X PAT, 505305
PATENT DATE: 12/30/1915
PATENTEE: Santa Fe Pacific Railroad

LOCATION: Township 6 S, Range 13 W, Section 26
PATENT NUMBER: Act of Congress, 956382
PATENT DATE: 03/26/1925
PATENTEE: William Lowe

LOCATION: Township 6 S, Range 13 W, Section 29
PATENT NUMBER: CE, 311
PATENT DATE: 11/16/1891
PATENTEE: William W. Low

LOCATION: Township 6 S, Range 13 W, Section 31
PATENT NUMBER: CE, 437

PATENT DATE: 10/30/1893
PATENTEE: John R. Marable

LOCATION: Township 6 S, Range 13 W, Section 33
PATENT NUMBER: Act of Congress, 956383
PATENT DATE: 03/26/1925
PATENTEE: Manuel King

LOCATION: Township 6 S, Range 13 W, Section 34
PATENT NUMBER: ACT OF CONG, 961811
PATENT DATE: 06/18/1925
PATENTEE: Raymond Burruel

LOCATION: Township 7 S, Range 14 W, Section 1
PATENT NUMBER: SS, 2
PATENT DATE: 09/17/1915
PATENTEE: State of Arizona

LOCATION: Township 7 S, Range 14 W, Section 1
PATENT NUMBER: SS, 2
PATENT DATE: 03/15/1915
PATENTEE: State of Arizona

LOCATION: Township 7 S, Range 14 W, Section 1
PATENT NUMBER: HE, 599059
PATENT DATE: 09/05/1917
PATENTEE: Leondus E. Farra

LOCATION: Township 7 S, Range 14 W, Section 10
PATENT NUMBER: IND RES X PAT, 505236
PATENT DATE: 12/30/1915
PATENTEE: Company Santa Fe Pacific Railroad

LOCATION: Township 7 S, Range 14 W, Section 11
PATENT NUMBER: DLE, 873940
PATENT DATE: 07/31/1922
PATENTEE: Andrew J. Case

LOCATION: Township 7 S, Range 14 W, Section 14
PATENT NUMBER: PX PAT, 02-70-0065
PATENT DATE: 03/13/1970
PATENTEE: Florence Vandenberg

LOCATION: Township 7 S, Range 14 W, Section 19
PATENT NUMBER: IND RES X PAT, 505224
PATENT DATE: 12/30/1915

PATENTEE: Santa Fe Pacific Railroad

LOCATION: Township 7 S, Range 15 W, Section 22
PATENT NUMBER: CE, 207
PATENT DATE: 12/20/1890
PATENTEE: Frederick Griffith

LOCATION: Township 7 S, Range 15 W, Section 22
PATENT NUMBER: HE, 390340
PATENT DATE: 03/07/1914
PATENTEE: Frank Corona

LOCATION: Township 7 S, Range 15 W, Section 23
PATENT NUMBER: CE, 784
PATENT DATE: 01/11/1892
PATENTEE: Fort E. Snider

LOCATION: Township 7 S, Range 15 W, Section 28
PATENT NUMBER: IN LIEU, 82
PATENT DATE: 02/28/1925
PATENTEE: State of Arizona

LOCATION: Township 7 S, Range 15 W, Section 29
PATENT NUMBER: CE, 427
PATENT DATE: 06/24/1893
PATENTEE: John H. Shanssey

LOCATION: Township 7 S, Range 15 W, Section 30
PATENT NUMBER: CE, 359
PATENT DATE: 08/01/1892
PATENTEE: William R. Cluness

LOCATION: Township 7 S, Range 15 W, Section 30
PATENT NUMBER: CE, 426
PATENT DATE: 06/24/1893
PATENTEE: Joseph H. Godfrey

LOCATION: Township 7 S, Range 15 W, Section 33
PATENT NUMBER: HE, 1066294
PATENT DATE: 09/27/1933
PATENTEE: George Lewis Brooks

LOCATION: Township 7 S, Range 16 W, Section 25
PATENT NUMBER: CE, 360
PATENT DATE: 08/01/1892
PATENTEE: Lafayette B. Clark

LOCATION: Township 8 S, Range 16 W, Section 4
PATENT NUMBER: SS, 3
PATENT DATE: 12/13/1915
PATENTEE: State of Arizona

LOCATION: Township 8 S, Range 16 W, Section 5
PATENT NUMBER: CE, 640 1/2
PATENT DATE: 10/20/1891
PATENTEE: Conrad Ochsner

LOCATION: Township 8 S, Range 16 W, Section 7
PATENT NUMBER: HE, 1037198
PATENT DATE: 05/15/1930
PATENTEE: Malcolm L. Sheldon

LOCATION: Township 8 S, Range 16 W, Section 8
PATENT NUMBER: DLE, 987760
PATENT DATE: 10/21/1926
PATENTEE: James D. Forest

LOCATION: Township 8 S, Range 16 W, Section 9
PATENT NUMBER: HE, 1073385
PATENT DATE: 11/30/1934
PATENTEE: Chesterton Dennis Norton

LOCATION: Township 8 S, Range 16 W, Section 17
PATENT NUMBER: SS, 3
PATENT DATE: 09/16/1915
PATENTEE: State of Arizona

LOCATION: Township 8 S, Range 16 W, Section 18
PATENT NUMBER: SS, 1
PATENT DATE: 06/30/1914
PATENTEE: State of Arizona

LOCATION: Township 8 S, Range 16 W, Section 18
PATENT NUMBER: CE, 1009152
PATENT DATE: 11/04/1927
PATENTEE: Thomas T. Davidson

LOCATION: Township 8 S, Range 16 W, Section 18
PATENT NUMBER: DLE, 1041071
PATENT DATE: 10/07/1930
PATENTEE: William R. Yancy

LOCATION: Township 8 S, Range 16 W, Section 18
PATENT NUMBER: CE, 1053257
PATENT DATE: 02/09/1932
PATENTEE: Jesse F. Jeffreys

LOCATION: Township 8 S, Range 16 W, Section 24
PATENT NUMBER: CE, 774
PATENT DATE: 11/16/1891
PATENTEE: Hiram W. Blaisdell

LOCATION: Township 8 S, Range 17 W, Section 11
PATENT NUMBER: CE, 347
PATENT DATE: 12/01/1891
PATENTEE: Norton Marshall

LOCATION: Township 8 S, Range 17 W, Section 11
PATENT NUMBER: CE, 836
PATENT DATE: 03/17/1892
PATENTEE: William H. Treichler

LOCATION: Township 8 S, Range 17 W, Section 12
PATENT NUMBER: CE, 432
PATENT DATE: 06/24/1893
PATENTEE: Christopher Horner

LOCATION: Township 8 S, Range 17 W, Section 12
PATENT NUMBER: CE, 869
PATENT DATE: 11/16/1891
PATENTEE: Norton Marshall

LOCATION: Township 8 S, Range 17 W, Section 12
PATENT NUMBER: CE, 970
PATENT DATE: 02/14/1893
PATENTEE: Thomas A. Fulton

LOCATION: Township 8 S, Range 17 W, Section 13
PATENT NUMBER: HE, 1018586
PATENT DATE: 08/24/1928
PATENTEE: Wilber A. Hughes

LOCATION: Township 8 S, Range 17 W, Section 13
PATENT NUMBER: DLE, 1074012
PATENT DATE: 01/16/1935
PATENTEE: Hiram Todd

LOCATION: Township 8 S, Range 17 W, Section 13

PATENT NUMBER: SS, 3
PATENT DATE: 12/13/1915
PATENTEE: State of Arizona

LOCATION: Township 8 S, Range 17 W, Section 14
PATENT NUMBER: DLE, 1009161
PATENT DATE: 11/08/1927
PATENTEE: Allen B. Ming

LOCATION: Township 8 S, Range 17 W, Section 14
PATENT NUMBER: DLE, 1028040
PATENT DATE: 05/31/1929
PATENTEE: William C. Lacy

LOCATION: Township 8 S, Range 17 W, Section 18
PATENT NUMBER: IND RES X PAT, 505229
PATENT DATE: 12/30/1915
PATENTEE: Santa Fe Pacific Railroad

LOCATION: Township 8 S, Range 17 W, Section 19
PATENT NUMBER: HE, 1017463
PATENT DATE: 07/12/1928
PATENTEE: Thomas H. Maroney

LOCATION: Township 8 S, Range 17 W, Section 19
PATENT NUMBER: HE, 1028522
PATENT DATE: 06/14/1929
PATENTEE: Randolph H. McElhaney

LOCATION: Township 8 S, Range 17 W, Section 19
PATENT NUMBER: HE, 1045475
PATENT DATE: 04/09/1931
PATENTEE: James P. Davis

LOCATION: Township 8 S, Range 17 W, Section 20
PATENT NUMBER: HE, 1018585
PATENT DATE: 08/24/1928
PATENTEE: James Hoyt Cowan

LOCATION: Township 8 S, Range 17 W, Section 20
PATENT NUMBER: CE, 876
PATENT DATE: 02/18/1892
PATENTEE: Isaac Rudisill (sp?)

LOCATION: Township 8 S, Range 17 W, Section 20
PATENT NUMBER: HE, 949047

PATENT DATE: 12/03/1924
PATENTEE: Sadie Carswell

LOCATION: Township 8 S, Range 17 W, Section 21
PATENT NUMBER: HE, 1026741
PATENT DATE: 04/26/1929
PATENTEE: Sadie Simonsen

LOCATION: Township 8 S, Range 17 W, Section 21
PATENT NUMBER: HE, 1027712
PATENT DATE: 05/24/1929
PATENTEE: Nathan M. Huckaby

LOCATION: Township 8 S, Range 17 W, Section 21
PATENT NUMBER: SS, 5
PATENT DATE: 01/02/1918
PATENTEE: State of Arizona

LOCATION: Township 8 S, Range 17 W, Section 21
PATENT NUMBER: CE, 595
PATENT DATE: 10/16/1891
PATENTEE: Charles Baker

LOCATION: Township 8 S, Range 17 W, Section 22
PATENT NUMBER: HE, 670611
PATENT DATE: 03/19/1919
PATENTEE: Charles S. Wheaton

LOCATION: Township 8 S, Range 17 W, Section 23
PATENT NUMBER: SS, 3
PATENT DATE: 12/13/1915
PATENTEE:

LOCATION: Township 8 S, Range 17 W, Section 24
PATENT NUMBER: DLE, 1032755
PATENT DATE: 12/12/1929
PATENTEE: Mattie M. Yancy

LOCATION: Township 8 S, Range 18 W, Section 11
PATENT NUMBER: HE, 1008083
PATENT DATE: 10/03/1927
PATENTEE: Andrew Arsensault

LOCATION: Township 8 S, Range 18 W, Section 12
PATENT NUMBER: HE, 615533
PATENT DATE: 01/31/1918

PATENTEE: William Forrest

LOCATION: Township 8 S, Range 18 W, Section 13
PATENT NUMBER: IND RES X PAT, 507210
PATENT DATE: 01/11/1916
PATENTEE: Santa Fe Pacific Railroad

LOCATION: Township 8 S, Range 18 W, Section 22
PATENT NUMBER: DLE, 591585
PATENT DATE: 07/11/1917
PATENTEE: Joseph E. Curry

LOCATION: Township 8 S, Range 18 W, Section 27
PATENT NUMBER: DLE, 591586
PATENT DATE: 07/11/1917
PATENTEE: Avery G. Curry

LOCATION: Township 8 S, Range 18 W, Section 28
PATENT NUMBER: CE, 528494
PATENT DATE: 05/11/1916
PATENTEE: Konrad Schmid

LOCATION: Township 8 S, Range 18 W, Section 29
PATENT NUMBER: IND RES X PAT, 505226
PATENT DATE: 12/30/1915
PATENTEE: Santa Fe Pacific Railroad

LOCATION: Township 8 S, Range 18 W, Section 30
PATENT NUMBER: CE, 537728
PATENT DATE: 07/13/1916
PATENTEE: Sarah Gertrude Stone

LOCATION: Township 8 S, Range 19 W, Section 25
PATENT NUMBER: RHE, 1187589
PATENT DATE: 10/20/1958
PATENTEE: Joseph R. Cullison

LOCATION: Township 8 S, Range 19 W, Section 33
PATENT NUMBER: HE, 1087246
PATENT DATE: 11/30/1936
PATENTEE: Dillard Johnson

LOCATION: Township 8 S, Range 19 W, Section 34
PATENT NUMBER: HE, 1061413
PATENT DATE: 02/09/1933
PATENTEE: Rubert Rufus Buereklin

LOCATION: Township 8 S, Range 20 W, Section 5
PATENT NUMBER: HE, 908845
PATENT DATE: 06/13/1923
PATENTEE: Sylvestre Villa

LOCATION: Township 8 S, Range 20 W, Section 6
PATENT NUMBER: HE, 1029407
PATENT DATE: 07/18/1929
PATENTEE: Henry C. Dollarhide

LOCATION: Township 8 S, Range 20 W, Section 17
PATENT NUMBER: DLE, 1017673
PATENT DATE: 07/18/1928
PATENTEE: William Edwin Oliver

LOCATION: Township 8 S, Range 20 W, Section 21
PATENT NUMBER: , 9182164
PATENT DATE: / /
PATENTEE: Lewis K. (heirs of) Hadnot

LOCATION: Township 8 S, Range 20 W, Section 27
PATENT NUMBER: DLE, 1186288
PATENT DATE: 09/16/1958
PATENTEE: M. Luther Bewley (sp?)

LOCATION: Township 8 S, Range 20 W, Section 28
PATENT NUMBER: CE, 1010546
PATENT DATE: 01/09/1928
PATENTEE: Francis Knowles
LOCATION: Township 8 S, Range 20 W, Section 34
PATENT NUMBER: HE, 1066400
PATENT DATE: 10/07/1933
PATENTEE: William Bradley Powers

LOCATION: Township 8 S, Range 21 W, Section 2
PATENT NUMBER: Ag. Lease, 01-514
PATENT DATE: 09/01/1992
PATENTEE: James H. and Mary L. Dunn

LOCATION: Township 8 S, Range 21 W, Section 3
PATENT NUMBER: IN LIEU, 370
PATENT DATE: 06/23/1967
PATENTEE: State of Arizona

LOCATION: Township 8 S, Range 21 W, Section 8

PATENT NUMBER: IN LIEU, 40
PATENT DATE: 11/26/1920
PATENTEE: State of Arizona

LOCATION: Township 8 S, Range 21 W, Section 17
PATENT NUMBER: DLE, 950221
PATENT DATE: 12/18/1924
PATENTEE: Henry Hansberger

LOCATION: Township 8 S, Range 21 W, Section 20
PATENT NUMBER: HE, 259679
PATENT DATE: 04/18/1912
PATENTEE: James Meana

LOCATION: Township 8 S, Range 21 W, Section 20
PATENT NUMBER: HE, 709732
PATENT DATE: 09/29/1919
PATENTEE: Alice Connor

LOCATION: Township 8 S, Range 22 W, Section 20
PATENT NUMBER: HE, 1022535
PATENT DATE: 01/21/1929
PATENTEE: Rufus Dees

LOCATION: Township 8 S, Range 22 W, Section 20
PATENT NUMBER: CE, 739285
PATENT DATE: 03/10/1920
PATENTEE: Charles A. Cassel

LOCATION: Township 8 S, Range 22 W, Section 21
PATENT NUMBER: HE, 261568
PATENT DATE: 04/25/1912
PATENTEE: Thomas W. Knox

LOCATION: Township 8 S, Range 22 W, Section 22
PATENT NUMBER: HE, 327362
PATENT DATE: 04/21/1913
PATENTEE: John M. Harris

LOCATION: Township 8 S, Range 22 W, Section 22
PATENT NUMBER: HE, 941526
PATENT DATE: 07/17/1924
PATENTEE: Robert W. Reinse (illegible)

LOCATION: Township 8 S, Range 22 W, Section 24
PATENT NUMBER: CE, 753

PATENT DATE: 11/09/1891
PATENTEE: Charles C. Stowe

LOCATION: Township 8 S, Range 22 W, Section 24
PATENT NUMBER: CE, 764
PATENT DATE: 11/09/1891
PATENTEE: Andrew Magnus Runsick

LOCATION: Township 8 S, Range 22 W, Section 27
PATENT NUMBER: CE, 608
PATENT DATE: 09/06/1890
PATENTEE: Frederick B. Southworth

LOCATION: Township 8 S, Range 22 W, Section 29
PATENT NUMBER: HE, 89
PATENT DATE: 04/01/1907
PATENTEE: Concepcion Armenta

LOCATION: Township 8 S, Range 22 W, Section 30
PATENT NUMBER: HE, 1034203
PATENT DATE: 01/24/1930
PATENTEE: Kate Maddox

LOCATION: Township 8 S, Range 22 W, Section 30
PATENT NUMBER: HE, 1034203
PATENT DATE: 01/24/1930
PATENTEE:

LOCATION: Township 8 S, Range 22 W, Section 30
PATENT NUMBER: DLE, 1136359
PATENT DATE: 09/04/1952
PATENTEE: Kenneth K. Surber

LOCATION: Township 9 S, Range 19 W, Section 3
PATENT NUMBER: IN LIEU, 8
PATENT DATE: 06/18/1918
PATENTEE: State of Arizona

LOCATION: Township 9 S, Range 19 W, Section 3
PATENT NUMBER: HE, 969797
PATENT DATE: 11/20/1925
PATENTEE: John Maurice Goold

LOCATION: Township 9 S, Range 19 W, Section 6
PATENT NUMBER: HE, 1026016
PATENT DATE: 04/12/1929

PATENTEE:

LOCATION: Township 9 S, Range 19 W, Section 6
PATENT NUMBER: HE, 1045220
PATENT DATE: 06/27/1929
PATENTEE:

LOCATION: Township 9 S, Range 19 W, Section 6
PATENT NUMBER: CE, 1054073
PATENT DATE: 03/25/1932
PATENTEE:

B. STATE PATENTS

LOCATION: Township 1 N, Range 1 W, Section 31
PATENT NUMBER: State Patent, 6566
PATENT DATE: 03/30/1978
PATENTEE: James L. King

LOCATION: Township 1 N, Range 1 W, Section 32
PATENT NUMBER: State Patent, 219
PATENT DATE: 09/24/1918
PATENTEE: Buckeye Irrigation Co.

LOCATION: Township 1 N, Range 1 E, Section 32
PATENT NUMBER: State Patent 54-98972-01
PATENT DATE: 11/05/1991
PATENTEE: Maricopa County Flood Control District of

LOCATION: Township 1 N, Range 1 W, Section 32
PATENT NUMBER: State Patent, 6353
PATENT DATE: 11/12/1975
PATENTEE: Maricopa County Board of Supervisors,

LOCATION: Township 1 N, Range 1 W, Section 33
PATENT NUMBER: State Patent 1513
PATENT DATE: 11/20/1929
PATENTEE: Chula Vista Ranch Co.

LOCATION: Township 1 N, Range 1 W, Section 33
PATENT NUMBER: State Patent 1514
PATENT DATE: 11/20/1929
PATENTEE: Chula Vista Ranch Co.

LOCATION: Township 1 N, Range 1 W, Section 36
PATENT NUMBER: State patent, 1124

PATENT DATE: 09/27/1927
PATENTEE: L.J. Holzwarth

LOCATION: Township 1 N, Range 1 W, Section 36
PATENT NUMBER: State Patent, 2946
PATENT DATE: 02/11/1944
PATENTEE: Elgie L. Burleson

LOCATION: Township 1 N, Range 1 W, Section 36
PATENT NUMBER: State Patent, 3166
PATENT DATE: 11/30/1944
PATENTEE: Lakin-Peter Cattle Co.

LOCATION: Township 1 N, Range 1 W, Section 36
PATENT NUMBER: State Patent, 4437
PATENT DATE: 06/19/1950
PATENTEE: Bert and Alice Amator

LOCATION: Township 1 N, Range 1 W, Section 36
PATENT NUMBER: State Patent, 5826
PATENT DATE: 06/05/1970
PATENTEE: William L. Amator

LOCATION: Township 1 N, Range 1 W, Section 36
PATENT NUMBER: State Patent, 6980
PATENT DATE: 01/31/1984
PATENTEE: William L. Amator

LOCATION: Township 1 N, Range 1 W, Section 36
PATENT NUMBER: State Patent, 6981
PATENT DATE: 01/31/1984
PATENTEE: William L. Amator

LOCATION: Township 1 N, Range 1 W, Section 36
PATENT NUMBER: State Patent, 986
PATENT DATE: 08/18/1926
PATENTEE: Bruno Ramirez

LOCATION: Township 1 N, Range 2 W, Section 36
PATENT NUMBER: State Patent, 3676
PATENT DATE: 12/08/1959
PATENTEE: M.B. and Cecil M. Kubelsky and Colvin

LOCATION: Township 1 N, Range 2 W, Section 36
PATENT NUMBER: State patent, 3677
PATENT DATE: 03/15/1946

PATENTEE: M.B., Cecil M. Kubelsky, Colwin

LOCATION: Township 1 S, Range 3 W, Section 16
PATENT NUMBER: State Patent, 2091
PATENT DATE: 05/16/1939
PATENTEE: Arlington Canal Company

LOCATION: Township 5 S, Range 5 W, Section 16
PATENT NUMBER: State Patent, 7505
PATENT DATE: 10/29/1992
PATENTEE: J & R LTD.

LOCATION: Township 5 S, Range 5 W, Section 16
PATENT NUMBER: State Patent, 7506
PATENT DATE: 10/29/1992
PATENTEE: J & R LTD.

LOCATION: Township 6 S, Range 13 W, Section 32
PATENT NUMBER: State Patent, 1542
PATENT DATE: 02/19/1930
PATENTEE: S.R. Jackson

LOCATION: Township 7 S, Range 14 W, Section 16
PATENT NUMBER: State Patent, 5520
PATENT DATE: 02/23/1967
PATENTEE: Augusta M. Phillips

LOCATION: Township 7 S, Range 14 W, Section 16
PATENT NUMBER: State Patent, 5521
PATENT DATE: 02/23/1967
PATENTEE: Brahma Farms, Inc.

LOCATION: Township 7 S, Range 14 W, Section 16
PATENT NUMBER: State Patent, 5957
PATENT DATE: 02/04/1972
PATENTEE: Wellton-Mohawk Irrigation and Drainage District

LOCATION: Township 7 S, Range 14 W, Section 16
PATENT NUMBER: State Patent, 5826
PATENT DATE: 02/04/1972
PATENTEE: Drainage District Wellton-Mohawk Irr. &

LOCATION: Township 7 S, Range 15 W, Section 32
PATENT NUMBER: State Patent, 5958
PATENT DATE: 02/04/1972
PATENTEE: Drainage District Wellton-Mohawk Irr. &

LOCATION: Township 7 S, Range 16 W, Section 36
PATENT NUMBER: State Patent, 5291
PATENT DATE: 03/28/1963
PATENTEE: Kenilworth Farms

LOCATION: Township 7 S, Range 16 W, Section 36
PATENT NUMBER: State Patent, 5292
PATENT DATE: 03/28/1963
PATENTEE: Lehi Farms Company

LOCATION: Township 7 S, Range 16 W, Section 36
PATENT NUMBER: State Patent, 5295
PATENT DATE: 03/29/1963
PATENTEE: Ipswich Farms

LOCATION: Township 7 S, Range 16 W, Section 36
PATENT NUMBER: State Patent, 5959
PATENT DATE: 02/04/1972
PATENTEE: Drainage District Wellton-Mohawk Irr. &

LOCATION: Township 8 S, Range 18 W, Section 16
PATENT NUMBER: State Patent, 3780
PATENT DATE: 07/23/1946
PATENTEE: D.M. and Evelyn A. Ritchie

LOCATION: Township 8 S, Range 19 W, Section 32
PATENT NUMBER: State Patent 5867
PATENT DATE: 01/07/1971
PATENTEE: Charles S. Powell

LOCATION: Township 8 S, Range 19 W, Section 32
PATENT NUMBER: State Patent 5968
PATENT DATE: 02/04/1972
PATENTEE: and Drainage Dist. Wellton-Mohawk Irr.

LOCATION: Township 8 S, Range 20 W, Section 16
PATENT NUMBER: State Patent, 5581
PATENT DATE: 11/22/1967
PATENTEE: Oscar & Dorothea Walls

LOCATION: Township 8 S, Range 20 W, Section 16
PATENT NUMBER: State Patent, 5638
PATENT DATE: 06/12/1968
PATENTEE: Ronnie L. Moore

LOCATION: Township 8 S, Range 20 W, Section 16
PATENT NUMBER: State Patent 5874
PATENT DATE: 01/27/1971
PATENTEE: Carolyn Lucille Walls

LOCATION: Township 8 S, Range 20 W, Section 16
PATENT NUMBER: State Patent, 5969
PATENT DATE: 02/04/1972
PATENTEE: Drainage District Wellton-Mohawk Irr. &

LOCATION: Township 8 S, Range 20 W, Section 16
PATENT NUMBER: State Patent, 6440
PATENT DATE: 02/16/1977
PATENTEE: Howard and Ellen Moore

LOCATION: Township 8 S, Range 20 W, Section 16
PATENT NUMBER: State Patent 7550
PATENT DATE: 10/22/1993
PATENTEE: Leslie W. and Bobbie Kammann

LOCATION: Township 8 S, Range 20 W, Section 16
PATENT NUMBER: State Patent 7549
PATENT DATE: 10/15/1993
PATENTEE: Leslie W. and Bobbie Kammann

LOCATION: Township 8 S, Range 20 W, Section 36
PATENT NUMBER: State Patent, 5970
PATENT DATE: 02/04/1972
PATENTEE: Drainage District Wellton-Mohawk Irr. &

LOCATION: Township 8 S, Range 20 W, Section 36
PATENT NUMBER: State Patent, 7210
PATENT DATE: 03/17/1987
PATENTEE: Jesse Ray & Sammie Hancock

LOCATION: Township 8 S, Range 20 W, Section 36
PATENT NUMBER: State Patent, 7373
PATENT DATE: 03/02/1989
PATENTEE: Jesse Ray & Sammie Hancock

LOCATION: Township 8 S, Range 20 W, Section 36
PATENT NUMBER: State Patent, 7374
PATENT DATE: 03/02/1989
PATENTEE: Jesse Ray Hancock

LOCATION: Township 8 S, Range 21 W, Section 2

PATENT NUMBER: State Patent 5807
PATENT DATE: 03/03/1970
PATENTEE: Hattie L. Spann

LOCATION: Township 8 S, Range 21 W, Section 2
PATENT NUMBER: State Patent 5971
PATENT DATE: 02/04/1972
PATENTEE: and Drainage Dist. Wellton-Mohawk Irr.

LOCATION: Township 11 S, Range 24 W, Section 14
PATENT NUMBER: State Patent, 5824
PATENT DATE: / /
PATENTEE: Robert M. Taubman

APPENDIX D – PUBLISHED SOURCES

"A Pyramid in California," *Latter-Day Saints' Millennial Star*, XV. Odyssey #1004, 10/15/1853.

"A Rumored Change of Line," *Railroad Gazette*, XXVIII. Odyssey #1096, 02/14/1896.

"A Stage Ride Through Arizona," *Forest and Stream*, V. Odyssey #983, 01/27/1876.

Allen, Col. D.K. "The Colorado River," *Arizona Magazine*, II. Odyssey #1000, 08/01/1893.

American Legion, Dept. of Arizona, The Opening Wedge for "Soldier Settlement." Phoenix: American Legion, 1921.

Annual Report of the Commissioner of Indian Affairs to the Secretary of the Interior for the Year 1870. Washington D.C.: United States Government Printing Office, 1870.

Annual Report of the Commissioner of Indian Affairs to the Secretary of the Interior for the Year 1872. Washington D.C.: United States Government Printing Office, 1872.

Annual Report of the Commissioner of Indian Affairs to the Secretary of the Interior for the Year 1875. Washington D.C.: United States Government Printing Office, 1875.

"Arizona," *Mining and Scientific Press*, XXXVIII. Odyssey #1917, 01/04/1879.

Arizona Center for Law in the Public Interest, et al v. Milo J. Hassell, et al, Supreme Ct. and the Ct. of Appeals, 1991-92, v. 172, No. 1 CA-CV 89-134. St. Paul: West Publishing Co., 1993.

Arizona Highways, Vol. XXXVII, No. 4. Phoenix: Arizona Highway Department, 04/01/1961.

Arizona Sentinel, 2 Rolls film, 06/24/1909-12/28/1911, 01/11/1912-06/3/1915. Yuma.

"Arizona Territory," *Rural Californian*, XV. Odyssey #2335, 08/01/1892.

Baird, Charles F. and Spencer F. Girard. "Descriptions of New Species of Fishes collected by Mr. John H. Clar, on the United States and Mexican Boundary Survey, under Lt. Col. Jas. D. Graham," *Proceedings of the Academy of Natural Science of Philosophy*, VI. Odyssey #1169, 08/01/1853.

Barnes, Will C. *Arizona Place Names*, Tucson: University of Arizona Press, 1960.

Barrows, H.D. "A Two Thousand Mile Stage Ride," *Historical Society of Southern California Quarterly*, III. Odyssey #989, 1896.

Bashford, Cole. *Compiled Laws of Arizona, 1864-1871*. Albany: Weed, Parsons, and Company, 1871.

Bolton, Herbert Eugene. *Spanish Exploration in the Southwest, 1542-1706*. New York: McGraw-Hill Book Co, 1932.

Bridges Across San Carlos Creek and Gila River, Letter from the Secretary of the Interior, Transmitting. 62 Cong., 3rd Sess., House Doc. No. 1013. Washington D.C.: United States Government Printing Office, 12/04/1912.

Bufkin, Donald and C.L. Sonnichsen. "Steamboat Through Hell: River Traffic on the Colorado of the West," *Water Trails West*. Garden City: Doubleday & Company, Inc., 1978.

Burkham, D.E. *Channel Changes of the Gila River in Safford Valley, Arizona*, United States Geological Survey Professional Paper 655-G. Washington D.C.: United States Government Printing Office, 1972.

Burkham, Dawdy, D.E., D.R. *Error Analysis of Streamflow Data for an Alluvial Stream, Gila River Phreatophyte Project*, United States Geological Survey Professional Paper 655-C. Washington D.C.: United States Government Printing Office, 1997.

"California to Arizona by Wagon," *Mining and Scientific Press*, SLII. 01/11/1881.

Casebier, Dennis G. *Camp El Dorado, Arizona Territory, Soldiers, Steamboats, and Miners on the Upper Colorado River*, Arizona Monographs, Number Two. Tempe: Arizona Historical Foundation, 1970.

Clarke, Asa Bement. *Travels in Mexico and California, Comprising a Journal of a Tour from Brazos Santiago . . . and the River Gila, to the Mining Districts of California*, Essays on the American West, Number Ten. College Station: Texas A & M University Press, 1988.

Clifford, Josephine. "A Romance of Gila Bend," *Overland Monthly*, IX. Odyssey #854, 11/01/1872.

Clifford, Josephine. "Camp-Life in Arizona," *Overland Monthly*, IV. Odyssey #847, 03/01/1870.

Clifford, Josephine. "Juanita," *Overland Monthly*, VIII. Odyssey #852, 04/01/1872.

Comeaux, Malcolm L. *Arizona, A Geography*, Boulder: Westview Press, 01/01/1981.

"Construction: Arizona," *Railway Age*, XXVIII. Odyssey #1018, 09/22/1899.

Coues, Elliot (translator). *On the Trail of a Spanish Pioneer: The Diary and Itinerary of Francisco Garces*. New York: Francis P. Harper, 01/01/1900.

Davis, Arthur P. *Eighteenth Annual Report of the Reclamation Service, 1918-1919.* Washington D.C.: United States Government Printing Office, 01/01/1919.

Ezell, Paul H. "The Conditions of Hispanic-Pimas Contacts on the Gila River," *America Indigena*, Vol. XVII, No. 2. 04/01/1957.

Emory, W.H. *Notes of a Military Reconnaissance from Fort Leavenworth in Missouri to San Diego in California*, 30th Congress, 1st sess., Senate Exec. Doc. No. 7. Washington D.C.: United States Government Printing Office, 1848.

Emory, William. *Report on the United States and Mexican Boundary Survey.* Austin: Texas State Historical Association, 1987.

Erosion and Overflow, Gila River, Ariz., 64th Cong., 1st sess., Senate Report 262. Washington D.C.: United States Government Printing Office, 03/16/1916.

Faulk, Odie B. *Destiny Road; the Gila Trail and the Opening of the Southwest.* New York: Oxford University Press, 1973.

Feth, J.H. and J.D. Hem. *Reconnaissance of Headwater Springs in the Gila River Drainage Basin, Arizona*, United States Geological Survey Water-Supply Paper No. 1619-H. Washington D.C.: United States Government Printing Office, 1963.

Fisher, C.C. *Report on San Carlos Project, Arizona, United States Reclamation Service.* United States Department of the Interior, 1920.

Folk-Williams, John. *The Gila Basin and the Waters of Southern Arizona, A Guide to Decision Making.* Santa Fe: Western Network, 1991.

Follansbee, Robert, et al. *Surface Water Supply of the U.S., 1911-Part IX. Colorado River Basin*, United States Geological Survey Water Supply Paper, No. 309. Washington D.C.: United States Government Printing Office, 1914.

Follansbee, Robert, et al. *Surface Water Supply of the U.S., 1912-Part IX. Colorado River Basin*, United States Geological Survey Water Supply Paper 329. Washington D.C.: United States Government Printing Office, 1914.

Forbes, R.H. *Irrigation and Agricultural Practice In Arizona*, University of Arizona Agricultural Experiment Station. Washington D.C.: Government Printing Office, 1911.

Freeman, W.B., and E.C. La Rue and H.D. Padgett. *Surface Water Supply of the U.S.-Colorado River Basin*, United States Geological Survey Water Supply Paper, No. 289. Washington D.C.: United States Government Printing Office, 1912.

Fremont, John C. "The Pacific Railroad," *Stryker's American Register and Magazine*, IV. Odyssey #1008, 07/01/1850.

Gannett, Henry. "The Great Plateau Region," *Penn Monthly*, VII. Odyssey #880, 11/01/1876.

Gila Bend Reservoir and Irrigation Company v. Gila Water Company. 202 United States 270 (1906), October Term, 1905. Washington D.C.: United States Government Printing Office, 1905.

Gila Bend Reservoir and Irrigation Company v. Gila Water Company. 205 United States 279 (1907), October Term, 1906. Washington D.C.: United States Government Printing Office, 01/01/1906.

Gila River Basin, New River and Phoenix City Streams, Arizona, Letter from the Secretary of the Army Transmitting a Letter from the Chief of Engineers. 89th Congress, 1st sess., House Doc. No. 216. Washington D.C.: United States Government Printing Office, 1965.

Globe Equity No. 59: In the District Court of the United States, in and for the District of Arizona, *The United States of America vs. Gila Valley Irrigation District*. Washington D.C.: Government Printing Office, 06/29/1935.

Greene, A.C. *900 Miles on the Butterfield Trail*. Denton: University of North Texas Press, 1994.

Grover, Nathan C. *Surface Water Supply of the U.S., 1913-Part IX. Colorado River Basin*, United States Geological Survey Water Supply Paper, No. 359. Washington D.C.: United States Government Printing Office, 1916.

Grover, Nathan C. *Surface Water Supply of the U.S., 1915-Part IX. Colorado River Basin*, United States Geological Survey Water Supply Paper, No. 409. Washington D.C.: United States Government Printing Office, 1918.

Grover, Nathan C. *Surface Water Supply of the U.S., 1916-Part IX. Colorado River Basin*, United States Geological Survey Water Supply Paper No. 439. Washington D.C.: United States Government Printing Office, 1919.

Grover, Nathan C. *Surface Water Supply of the U.S., 1917-Part IX. Colorado River Basin*, United States Geological Survey Water Supply Paper, No. 459. Washington D.C.: United States Government Printing Office, 1921.

Grover, Nathan C. *Surface Water Supply of the U.S., 1918-Part IX. Colorado River Basin*, United States Geological Survey Water Supply Paper, No. 479. Washington D.C.: United States Government Printing Office, 1922.

Halpenny, L.C. et al. *Ground Water in the Gila River Basin and Adjacent Areas, Arizona-A Summary, Open File Report*. Tucson: 1952.

Heap, Gwinn Harris. *Central Route to the Pacific, from the Valley of the Mississippi to California: Journal of the Expedition of E.F. Beale . . . and . . . From Missouri to California in 1853, The Far West and the Rockies Historical Series 1820-75*. Glendale: The Arthur H. Clark Company, 1957.

Hinderlider, M.C. and G.L. Swendsen. *Report of Progress of Stream Measurements for the Calendar Year 1905, Part XI. Colorado River Drainage above Yuma*, United States Geological Survey Water Supply Paper No. 175. Washington D.C.: United States Government Printing Office, 01/01/1906.

Hough, Walter. *Antiquities of the Upper Gila and Salt River Valleys in Arizona and New Mexico*, Bureau of American Ethnology, Bulletin 35. Washington D.C.: United States Government Printing Office, 1907.

Hough, Walter. *Hemenway Southwestern Archaeological Expedition, 1887-88*, 1888.

Hunter, Louis C. Steamboats on the Western Rivers, An Economic and Technological History. Cambridge: Harvard University Press, 1949.

Investigation of Waters of Gila River, New Mexico and Arizona. 70th Cong., 1st sess., House Report No. 1101. Washington D.C.: United States Government Printing Office, 04/02/1928.

Kruckeburg, H.W. "Arizona: The Land of Irrigation and Perpetual Sunshine," *Rural Californian*, XIX. 12/01/1896.

Kupel, Douglas E. *Historical and Hydrological Analysis of the Salt River with Reference to Navigability, Granite Reef Dam to the Confluence with the Gila River, Arizona*, Phoenix: City of Phoenix, 12/06/1996.

"Latest News of Irrigation Progress: Arizona, The Big Canals – Notes of Progress in the Sunny Lands of Irrigation Enterprises," *Irrigation Age*, III. Odyssey #2329, 05/15/1892.

Lee, W.T. *The Underground Waters of Gila Valley, Arizona*, United States Geological Service Water Supply Paper No. 104. Washington D.C.: United States Government Printing Office, 1904.

Leigh, Vanstan. "South Gila Canal – What is Being Done to Develop the Irrigation Enterprises of the Territory," *Irrigation Age*, V. Odyssey #2349, 07/01/1893.

Leigh, Vanstan. "The Arizona Project – Capital Invested and Being Placed in Irrigation Works in the Territory," *Irrigation Age*, V. Odyssey #2347, 06/01/1893.

Lippincott, Joseph Barlow. *Storage of Water on Gila River, Arizona*, U.S.G.S. Water Supply and Irrigation Paper No. 33. Washington D.C.: United States Government Printing Office, 1900.

Lott, Charles Fayette. "Filibusterism," *Pioneer, or California Monthly Magazine*, I. Odyssey #550, 01/01/1854.

McClatchie, Alfred J. *Utilizing Our Water Supply*, University of Arizona Agricultural Experiment Station. Washington D.C.: United States Government Printing Office, 1902.

Meeker, R.I. and H.S. Reed. *Surface Water Supply of Colorado River Drainage Above Yuma*, United States Geological Survey Water Supply Paper, No. 211. Washington D.C.: United States Government Printing Office, 1908.

Metropolitan Water District of Southern CA, *Development on the Gila River in Arizona*, Report No. 16. 1927.

"Mining in Arizona," *Gazlay's Pacific Monthly*, I. Odyssey #2255, 03/01/1865.

Mowry, Sylvester. "The Geography and Resources of Arizona and Sonora," *Journal of the American Geographical and Statistical Society*, I. Odyssey #554, 03/01/1859.

M.P.M., "Phoenix in '72 and '73," *The Southwest Illustrated Magazine*, I. Odyssey #988, 06/01/1895.

Munk, Joseph. *Features of an Arizona Library*. Los Angeles: Times-Mirror Printing and Binding House, 1926.

Munk, J.A. "Arizona," *The California Medical Journal*, Vol. XIV, No. 11. San Francisco: Odyssey #679, 11/01/1893.

Murphy, Edward Charles, et al. *Destructive Floods in the United States in 1905, with a Discussion of Flood Discharge and Frequency and an Index to Flood Literature*, Water Supply Paper No. 162. Washington, D.C.: United States Government Printing Office, 1906.

"Navigation of the Colorado," *Mining & Scientific Press*, VIII. Odyssey #997, 01/30/1864.

Nels Benson, Plaintiff, vs. John Allison and four hundred fifty-four others, defendants: Decree: Nov. 14, 1917, Phoenix.

"New Enterprises," *Arizona Industrial Magazine*, II. Odyssey #2352, 10/01/1893.

Newell, Frederick H. *Fourth Annual Report of the Reclamation Service, 1904-5*, Washington D.C.: United States Government Printing Office, 1906.

Newell, Frederick H. *Fifth Annual Report of the Reclamation Service, 1906*. Washington D.C.: United States Government Printing Office, 1906.

Newell, Frederick H. *Sixth Annual Report of the Reclamation Service, 1906-1*907. Washington D.C.: United States Government Printing Office, 1907.

Newell, Frederick H. *Seventh Annual Report of the Reclamation Service, 1907-1908.* Washington D.C.: United States Government Printing Office, 1908.

Newell, Frederick H. *Eighth Annual Report of the Reclamation Service, 1908-1909.* Washington D.C.: United States Government Printing Office, 1910.

Newell, Frederick H. *Tenth Annual Report of the Reclamation Service, 1910-1911.* Washington D.C.: United States Government Printing Office, 1912.

Oregon Historical Society, *Steamboat Days on the Rivers*. Portland: Oregon Historical Society, 1969.

Perley, Lewis M. *Movements of the Gila and Colorado Rivers in the Yuma Area During Historic Times: With Specific Attention to Certain Lands in Township 8 South, Range 23 West*. Phoenix: P.M. Lewis, 1961.

"Phoenix in '72 and '73," *The Southwest Illustrated Magazine*, I. 06/01/1895.

Phoenix School, Gila River, Chuahchu, Cocklebure, and Gila Bend Reservations, Hearings Before the Joint Commission of the Congress of the United States, to Investigate Indian Affairs. 63rd Cong., 1st Sess., Published Hearings. Washington D.C.: United States Government Printing Office, 01/01/1914.

Pierson, Lloyd. "A Short History of Camp Verde, Arizona, to 1890," *El Palacio*, Vol. 64. 11/01/1957.

"Records of Progress and Irrigation Developments in the Semi-Tropical Southwest Territory," *Irrigation Age*, IV. Odyssey #2344, 03/01/1893.

Repair of Territorial Bridge Across Gila River at Florence, Ariz. 59th Cong., 2nd sess., House Report 6599. Washington D.C.: United States Government Printing Office, 1907.

Report of the Commissioner of Corporations on Transportation by Water in the United States, General Conditions of Transportation by Water, Part I. Washington D.C.: United States Government Printing Office, 1909.

Report of the Commissioner of Corporations on Transportation by Water in the United States, Water-Borne Traffic, Part II. Washington D.C.: United States Government Printing Office, 1909.

Report of the Commissioner of Indian Affairs to the Secretary of the Interior for the Year 1871. Washington D.C.: United States Government Printing Office, 1872.

Report of the Governor of Arizona to the Secretary of the Interior for the Year Ended June 30, 1903. Washington D.C.: United States Government Printing Office, 1903.

Research Management West. *A Historical Analysis of the Verde River, Arizona. Prepared for Miscal, Weeks, McIntyre, and Friedlander*. Tempe, 1987.

Robinson, R.E.L. "Yuma, Arizona," *Californian Illustrated Magazine*, IV. Odyssey #844, 11/01/1893.

Robinson, Lieut. R.E.L. "Adrift in a Desert," *Californian Illustrated Magazine*, V. Odyssey #1001, 12/01/1893.

Root, W.A. "Arizona Territory," *Rural Californian*, XV. Odyssey #2275, 07/01/1892.

Ross, Clyde P. *Routes to Desert Watering Places in the Lower Gila Region, Arizona*, United States Geological Survey, Water Supply Paper No. 490-C. Washington D.C.: Government Printing Office, 1922.

Rott, Edward H. *Report on the Geology and Water Resources of the Gila River Indian Reservation,* United States Department of Agriculture, Soil Conservation Service. Unpublished, 1936.

Russell, Frank. *The Pima Indians, 26th Annual Report of the Bureau of American Ethnology.* Washington, D.C.: United States Government Printing Office, 1908.

Simpson, J.H. "Navajo Expedition," in *Journal of a Military Reconnaissance from Santa Fe, New Mexico, to the Navajo Country, Made in 1849*, Frank McNitt, ed. Norman: Oklahoma University Press, 1964.

Smith, Fay J., et al. *Father Kino in Arizona.* Phoenix: Arizona Historical Foundation, 1966.

Southworth, C.H. *History of Irrigation on the Gila River*. 1915.

"Stage Travel in Arizona," *Arizona Quarterly Illustrated*, I. Odyssey # 984, 07/01/1880.

State Claims of Ownership of Lands Beneath Watercourses - Defenses; Quitclaim; Relinquishment; Disclaimer; Riparian Acquisition Trust Fund. House Bill 2017, Chapter 127, 38th Legislature, 1st Session. Phoenix, 1987.

State of California Department of Public Works, *Views and Recommendations of State of California on Proposed Report of Chief of Engineers, United States Army on Gila River and Tributaries Below Gillespie Dam Arizona*. 07/01/1949.

Surface Water Supply of the U.S.-Colorado River Basin, United States Geological Survey Water Supply Paper, No. 274. Washington D.C.: United States Government Printing Office, 1911.

Surface Water Supply of the U.S., 1919-1920-Colorado River Basin, United States Geological Survey Water Supply Paper, No. 509. Washington D.C.: United States Government Printing Office, 1919.

Surface Water Supply of the U.S., 1922-Part IX. Colorado River Basin, United States Geological Survey Water Supply Paper, No. 549. Washington D.C.: United States Government Printing Office, 1922.

Surface Water Supply of the U.S., 1923-Colorado River Basin, United States Geological Survey Water Supply Paper, No. 569. Washington D.C.: United States Government Printing Office, 1923.

Surface Supply of the U.S., 1949-Colorado River Basin, United States Geological Survey Water Supply Paper No. 1149. Washington D.C.: United States Government Printing Office, 1949.

Survey of Pima and Maricopa Reservation, Letter From the Secretary of the Interior in Relation to the Proposed Extension of the Survey of the Pima and Maricopa Indian Reservation in Arizona. 41st Cong., 3d Sess., House Ex. Doc. 139. Washington D.C.: United States Government Printing Office, 1871.

The Advisory Committee on Irrigation Efficiency. *Special Report on Measures for Reducing Return Flows from the Wellton-Mohawk Irrigation and Drainage District*, Wellton-Mohawk Irrigation and Drainage District. 1974.

"The Gila Bend Canal," *Arizona Industrial Magazine*, II. Odyssey #2353, 10/01/1893.

"The New Territory of Arizona," *DeBow's Review*, XXIII. Odyssey #551, 11/01/1857.

"The Railroad Bridge at Yuma," *Mining & Scientific Press*, XL. Odyssey #1095, 05/01/1880.

"The Pacific Railways of the South," *Ocean Highways: The Geographical Review*, NS. I. Odyssey #1009, 10/01/1873.

"The Peralta Forgeries," *The Argonaut*, XLIV. Odyssey #1963, 04/17/1899.

"The Progress of Irrigation: A Great Arizona Reservoir," *Irrigation Age*, III. Odyssey #2331, 06/01/1892.

"The Story of Yuma," *Arizona Magazine*, I. Odyssey #842, 06/01/1893.

Theobold, John and Lillian. *Arizona Territory: Post Offices and Postmasters*. Phoenix: Arizona Historical Foundation, 1961.

Tipton, Will M. "The Prince of Impostors," *The Land of Sunshine*, VIII. Odyssey #1961, 02/01/1898.

Townsend, C.H. Tyler. "A Wagon-Trip to the Grand Canon of the Colorado River," *Appalachia*, VII. Odyssey #994, 02/01/1893.

United States Army Corps of Engineers. *Gila River Basin New River and Phoenix City Streams, Arizona, Maricopa county, Arizona: Cave Buttes Foundation Report*. Los Angeles: United States Army, Corps of Engineers, Los Angeles District, 1983.

United States Army Corps of Engineers. *Gila River Basin New River and Phoenix City Streams, Arizona, Alternative Plans for Flood Control and Recreational Development*. Los Angeles: United States Army Corps of Engineers, Los Angeles District, 1974.

United States Army Corps of Engineers. *Gila River, Camelback Reservoir Site to Salt River, Arizona: Letter from Secretary of the Army, transmitting a letter from the Chief of Engineers. . . .* Washington, D.C.: United States Government Printing Office, 1959.

United States Army Corps of Engineers. *List of Bridges Over Navigable Waters of the United States, Revised to July 1, 1941*. Washington D.C.: United States Government Printing Office, 1948.

United States Army Corps of Engineers. *Preliminary Report, Camelback Dam Project, Ariz. Gila River Basin*. Los Angeles: United States Army Corps of Engineers, Los Angeles District, 1982.

United States Congress. *Salt and Gila Rivers-Reservations and Reclamation Service: Hearings Before a Subcommittee on Expenditures in the Interior Department of the House, under H. Res. 103*. Washington, D.C.: United States Government Printing Office, 1912.

United States Department of the Interior. *Gila River Flood Control: Letter from the Secretary of the Interior transmitting, pursuant to law a report on flood control of the Gila River in Graham County, AZ*. 65th Cong., 3rd Sess., Senate Document 436. Washington D.C.: United States Government Printing Office, 1919.

United States Geological Survey. *Sixth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1884-85*. Washington D.C.: United States Government Printing Office, 1885.

United States Geological Survey. *Eleventh Annual Report of the United States Geological Survey to the Secretary of the Interior, 1889-1890, Part II-Irrigation*. Washington D.C.: United States Government Printing Office, 1891.

United States Geological Survey. *Twelfth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1890-91, Part II-Irrigation*. Washington D.C.: United States Government Printing Office, 1891.

United States Geological Survey. *Thirteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1891-92, Part III-Irrigation.* Washington D.C.: United States Government Printing Office, 1893.

United States Geological Survey. *Eighteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1896-97, Part IV-Hydrography.* Washington D.C.: United States Government Printing Office, 1897.

United States Geological Survey. *Twenty-First Annual Report of the United States Geological Survey, Part IV, for the Fiscal Year Ended June 30, 1900.* Washington D.C.: United States Government Printing Office, 1901.

United States Geological Survey. *Twenty-Second Annual Report of the United States Geological Survey of the Secretary of the Interior, 1900-1901, Part IV-Hydrography.* Washington D.C.: United States Government Printing Office, 1902.

United States Reclamation Service. *Twelfth Annual Report of the Reclamation Service, 1912-1913.* Washington D.C.: United States Government Printing Office, 1914.

United States Reclamation Service. *Thirteenth Annual Report of the Reclamation Service, 1913-1914.* Washington D.C.: United States Government Printing Office, 1915.

United States Reclamation Service. *Fourteenth Annual Report of the Reclamation Service, 1914-1915.* Washington D.C.: United States Government Printing Office, 1915.

United States Reclamation Service. *Fifteenth Annual Report of the Reclamation Service, 1915-1916.* Washington D.C.: United States Government Printing Office, 1916.

Wahmann, Russell. "Railroading in the Verde Valley," *Journal of Arizona History* 12: 153-166. 1971.

Wallace, Andrew. *Sources and Readings in Arizona History.* Tucson: Arizona Pioneers' Historical Society, 1965.

Water Resources Branch, Division of Surface Water. *Summary of Records of Surface Waters at Stations on Tributaries in Lower Colorado River Basin, 1888-1938*, United States Geological Survey Water Supply Paper No. 1049. Washington D.C.: United States Government Printing Office, 1947.

Wheeler, George M. and David W. Lockwood. *Report on Exploration of the Public Domain in Nevada and Arizona.* House Ex. Doc. 65, 42nd Congress, 2nd session. Washington D.C.: United States Government Printing Office, 1872.

"Wild Camels in Arizona," *Locomotive, NS.* XV. Odyssey #978, 03/01/1894.

Wilson, John. *San Carlos Dam Appropriation; Speech of J.F. Wilson of Arizona, in the House of Representatives, Tuesday, Feb. 26, 1901.* Washington D.C.: United States Government Printing Office, 1901.

"Work in Constructing Irrigation Canals Continues to Increase in the Sunny Southern Territory," *Irrigation Age*, IV. Odyssey #2339, 01/01/1893.

"Yuma," *Sunset*, IV. Odyssey #845, 12/01/1899.

APPENDIX E – RESUME OF DOUGLAS R. LITTLEFIELD

Douglas R. Littlefield, Ph.D.
Littlefield Historical Research
6207 Snake Road
Oakland, California 94611
Telephone: (510) 339-1017
Email: douglittlefield@aol.com

EDUCATION:

Ph.D. American history. University of California, Los Angeles, 1987. Dissertation: "Interstate Water Conflicts, Compromises, and Compacts: The Rio Grande, 1880-1938." Fields: history of California and the American West, water rights history, legal history, environmental history.

M.A. American history. University of Maryland, College Park, 1979. Master's thesis: "A History of the Potomac Company and Its Colonial Predecessors." Fields: business history, colonial history, early republic history, trans-Appalachian West history, British history.

B.A. English literature. Brown University, 1972.

CONSULTING AND EXPERT WITNESS EXPERIENCE:

2004 – Present: Research historian and consultant for City of Santa Maria, California (counsel: Best, Best & Krieger of Riverside, California). Providing historical research and documentation on the history of water rights of the U.S. Bureau of Reclamation's Santa Maria Project (California) for use in *Santa Maria Valley Water Conservation District v. City of Santa Maria, Southern California Water Company, City of Guadalupe, et al.*, Santa Clara County (California) Superior Court, Case No. CV 770214.

2004 – Present: Research historian and consultant for City of Pocatello, Idaho (counsel: Beeman & Associates of Boise, Idaho, and White & Jankowski of Denver, Colorado). Providing historical research and documentation on the history of Pocatello's water rights for use in Snake River Basin Adjudication (*In Re: the General Adjudication of Rights to the Use of Water From the Snake River Drainage Basin Water System, State of Idaho v. United States; State of Idaho; and all unknown claimants to the use of water from the Snake River Drainage Basin Water System*), County of Twin Falls (Idaho) District Court, Case No. 39576.

2003 – Present: Research historian and consultant for U.S. Bureau of Reclamation (Mid-Pacific Region). Providing historical research and a report on the history of the water rights of the Friant Unit of the Bureau's Central Valley Project (California).

2002 Research historian and consultant for the Alameda County Water District. Provided historical research and a report on the history of the water rights of the District.

2001 – Present: Research historian and consultant for Paloma Investment Limited Partnership (counsel: Mesch, Clark & Rothschild of Tucson, Arizona). Providing historical research (and deposed) regarding whether the Gila River was navigable in 1912 when Arizona became a state for use in *Flood Control District of Maricopa County v. Paloma Investment Limited Partnership and Paloma Investment Limited Partnership v. Flood Control District of Maricopa County*, Maricopa County (Arizona) Superior Court, Case No. CV97-07081.

2000 – 2001: Research historian and consultant for Salt River Project, Arizona (counsel: Salmon, Lewis & Weldon of Phoenix, Arizona). Provided extensive historical research and documentation on Zuni Indian water rights and land claims in Arizona and New Mexico for use in *In re the General Adjudication of All Rights to Use of Water in the Little Colorado River System and Source*, Apache County (Arizona) Superior Court, Case No. 6417.

2000 – 2001: Research historian and consultant for the Maryland Attorney General. Provided historical research and affidavit testimony on the 1785 "Mount Vernon" interstate compact between Maryland and Virginia for use in U.S. Supreme Court case of *Virginia v. Maryland*, No. 129 Original.

2000 Research historian and consultant for the Salt River Project, Arizona (counsel: Salmon, Lewis & Weldon of Phoenix, Arizona). Provided historical research and documentation on water rights of the Gila River, Arizona, for use in *In Re: The General Adjudication of All Rights to Use Water in the Gila River System and Source*, Maricopa County (Arizona) Superior Court, Case No. W1-203.

1998 – 2000: Research historian and consultant for the Idaho Attorney General. Provided historical research and report on whether the Salmon River and selected tributaries were navigable in 1890 when Idaho became a state.

1998 – 1999: Research historian and consultant for the Idaho Coalition, a landowners' group (counsel: John K. Simpson of Rosholt, Robertson & Tucker of Boise, Idaho, and Shawn Del Ysura of J.R. Simplot Company of Boise, Idaho). Provided historical research, and affidavit testimony on the impacts of various dams in the Columbia River and Snake River watersheds on anadromous fish for use in Snake River Basin Adjudication (*In Re: the General Adjudication of Rights to the Use of Water From the Snake River Drainage Basin Water System, State of Idaho v. United States; State of Idaho; and all unknown claimants to the use of water from the Snake River Drainage Basin Water System*), County of Twin Falls (Idaho) District Court, Case No. 39576.

1998 – 2000: Research historian and consultant for Sacramento Municipal Utility District of California (counsel: Ronald Aronovsky of Alden, Aronovsky & Sax of San Francisco). Provided research on land site history for use in *Sacramento Municipal Utility District v. California Department of Transportation, Sacramento Housing and Redevelopment Agency, et al.*, Sacramento County (California) Superior Court, Case No. 96AS04149.

1997 – Present: Research historian and consultant for City of Las Cruces, New Mexico (counsel: Stein & Brockmann of Santa Fe, New Mexico). Providing historical research and report on the City's water rights for use in *State of New Mexico v. Elephant Butte Irrigation District*.

1997 – 2003: Research historian and consultant for Fort Hall Water Users' Association, Idaho (counsel: Richard Simms of Hailey, Idaho). Provided historical research and report the Association's water rights in relation to the Shoshone and Bannock Indian land cessions on the Fort Hall Indian Reservation in Idaho for use in *Fort Hall Water Users' Association, et al., v. United States of America*, U.S. Court of Federal Claims, Case No. 01-445L.

1997 – Present: Research historian and consultant for Kern Delta Water District. Providing historical research and report on Kern Delta's water rights for use in *North Kern Water Storage District v. Kern Delta Water District, et al.*, Tulare County (California) Superior Court, Case No. 96-172919. Testified in that case as an expert witness historian for ten days in the initial trial, which was remanded for additional testimony and evidence. Providing additional research and written reports on water rights for the remanded trial.

1996 – 1998: Research historian and consultant for Idaho Attorney General. Provided historical research and report on water rights in relation to the Deer Flat National Wildlife Refuge for use in Snake River Basin Adjudication (*In Re: the General Adjudication of Rights to the Use of Water From the Snake River Drainage Basin Water System, State of Idaho v. United States; State of Idaho; and all unknown claimants to the use of water from the Snake River Drainage Basin Water System*), County of Twin Falls (Idaho) District Court, Case No. 39576.

1995 – 1998: Research historian and consultant for U.S. Department of Justice. Provided historical documentation on the history of water rights on the Santa Margarita River at U.S. Marine Corps Base, Camp Pendleton, in southern California.

1995 – Present: Research historian and consultant for the Salt River Project (counsel: Salmon, Lewis & Weldon of Phoenix, Arizona). Providing historical documentation and reports on whether the Salt, Gila, and Verde rivers were navigable in 1912 when Arizona became a state. Testified in 1997 and 1998 before the Arizona Navigable Stream Adjudication Commission regarding the navigability of the Salt, Verde, and Gila rivers. Testified on the same subject in 1998 and 1999 before the Arizona State Legislature.

1995 – 2001: Research historian and consultant for Nebraska Department of Water Resources (counsel: Stein & Brockmann of Santa Fe, New Mexico). Provided historical documentation and report on water rights and the history of *Nebraska v. Wyoming*, 325 U.S. 589 (1945), for use in U.S. Supreme Court case of *Nebraska v. Wyoming*, Original No. 108, regarding the apportionment of the waters of the North Platte River. Deposed in that case, but the case was settled before trial.

1993 – 1994: Research historian and consultant for Simms and Stein, attorneys specializing in water law in Santa Fe, New Mexico. Provided historical documentation and affidavit testimony on Arapaho and Shoshone land claims and cessions along the Wind River in Wyoming 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.

1991 – 2003: Research historian and consultant for Legal Counsel, Division of Water Resources, Kansas State Board of Agriculture (counsel: Montgomery & Andrews of Santa Fe, New Mexico). Provided historical documentation and reports on water rights and history of apportionment of the Republican River and its tributaries among Kansas, Nebraska, and Colorado for use in U.S. Supreme Court case of *Kansas v. Nebraska and Colorado*, No. 126 Original, regarding the interstate apportionment of the Republican River.

1991 – 1993: Research historian and consultant for Nickel Enterprises (Bakersfield, California; counsel: Anthony Murray of Carlsmith, Ball, Wichman, Murray, Case, Mukai & Ichiki of Long Beach, California. Provided historical documentation and report on the navigability of the Kern River for use in *Nickel Enterprises v. State of California*, Kern County (California) Superior Court, Case No. 199557. 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 (counsel: Simms & Stein of Santa Fe, New Mexico). Provided historical documentation of water rights claims along the Bonito, Hondo, and Ruidoso rivers in southeastern New Mexico for use in *State v. Lewis*, Chaves County (New Mexico), Case Nos. 20294 & 22600, Consolidated.

1986 – 1990: Research historian and consultant for Legal Counsel, Division of Water Resources, Kansas State Board of Agriculture (counsel: Simms & Stein of Santa Fe, New Mexico). 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 of *Kansas v. Colorado*, October Term 1985, Original No. 105, regarding the interstate apportionment of the Arkansas River. 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 (New Mexico) Case 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 water rights on the Rio Grande and interstate apportionment disputes between New Mexico and Texas for use in *El Paso v. Reynolds*, U.S. District Court, Civ. Case No. 80-730-HB.

OTHER PROFESSIONAL EXPERIENCE:

January 1992 – 1994: Member of Board of Editors of *Western Historical Quarterly*.

1991 – 1995: Lecturer, Department of History, California State University, Hayward. Taught a graduate seminar on environmental history and also taught survey courses on American history and California history.

1980 – 1984: Editorial Assistant, *Pacific Historical Review*. Edited scholarly articles and book reviews.

1979 – 1979: Lecturer, University of Maryland's University College off-campus program. Taught courses on the history of the American West and U.S. History surveys.

PUBLICATIONS:

Books:

The Spirit of Enterprise: A History of Pacific Enterprises, 1867-1989 (coauthor, 1990).

Articles:

"The History of the Rio Grande Compact of 1938," in Catherine T. Ortega Klett, ed., *44th Annual New Mexico Water Conference – Proceedings – The Rio Grande Compact: It's the Law* (Las Cruces: New Mexico Water Resources Research Institute, 2000).

"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:

Sarah S. Elkind, *Bay Cities and Water Politics: The Battle for Resources in Boston and Oakland* (Lawrence: University Press of Kansas, 1998), in *Environmental History* (2000).

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* (1995).

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).

Zachary A. Smith, ed., *Water and the Future of the Southwest* (Albuquerque: University of New Mexico Press, 1989), in *Western Historical Quarterly* (1991).

F. Lee Brown and Helen Ingram, *Water and Poverty in the Southwest* (Tucson: University of Arizona Press, 1987), in *The Public Historian* (1990).

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 History 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 Historical Association, American Society for Environmental History, California Committee for the Promotion of History, California Historical Society, National Council on Public History, Ninth Judicial Circuit Court Historical Society, Organization of American Historians, Western History Association, Western Council on Legal History.