Cottonwood Ford Near Fort Verde, circa 1885. Source: Fort Verde State Historic Park

REVISED AND UPDATED REPORT:

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

by

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EXECUTIVE SUMMARY

The purpose of this report is to assess the navigability of the Verde River between its headwaters downstream to the confluence with the Salt River on or before February 14, 1912 – the date Arizona became a state. This report is a revised version of a report on the same topic written by Douglas R. Littlefield and dated July 7, 2005, and that study, in turn, was an updated version of a December 5, 1996, report on the Verde River's navigability.

This updated study is intended to add further information about the historical characteristics of the Verde River, especially now that internet resources have made digital access to historical newspapers and photographs substantially easier than before. This extra insight is necessary to conform with the opinion of the Arizona Court of Appeals decision in *State of Arizona, et al., v. Arizona Navigable Stream Adjudication Commission, et al.* (1 CA-CV 07-0704, April 27, 2010) that a fuller awareness of how human activities and manmade structures on the Verde River may have affected that stream's ordinary and natural condition at or before statehood.

To make the evaluation of the Verde River's navigability in 1912, a wide array of published and unpublished documents and photographs were consulted (discussed in greater detail in the "Introduction").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

Taken as a whole, these records overwhelmingly illustrate that prior to and at the time of Arizona's statehood the Verde River was considered *not* navigable by virtually every contemporaneous observer. The historical record amply demonstrates that the Verde River was

highly erratic, subject to flooding and major channel changes, and blocked by obstacles. In short, the Verde River was not navigable on or before February 14, 1912.

INTRODUCTION

The answer to the question of who is the original owner of the bed of a stream or lake anywhere in the United States depends on what that waterway was like at the time the region became a state. Historically, this principle stems from the original thirteen American colonies' relationship with the Crown of England. Over centuries, common law had evolved in England establishing that the king owned the beds of commercially navigable waterways in order to protect their accessibility for his subjects. This royal power had developed in order to prevent parties from building structures such as wharves, docks, or mill dams that might interfere with commercial boat traffic. The beds of non-navigable waterways where transportation was not an issue, in turn, were owned by adjacent landowners. This principle was well established under English common law long before the American Revolution, and it therefore applied to the American colonies as well to royal subjects in England.

Following the American Revolution in 1776, the rights and duties of the English government were passed on to the newly independent states, thus making them the owners of the beds of commercially navigable streams and lakes within their boundaries by virtue of their new-found sovereignty. The United States Constitution subsequently mandated that all new states enter the Union on the same footing as the original thirteen. Therefore, as additional states joined the Union, they became the owners of the beds of waterways within their borders that were navigable at the time of statehood.

In Arizona's case, this "same footing" doctrine means that if any stream or lake within the state was navigable on or before February 14, 1912 – the date Arizona joined the Union – the bed was the state's sovereign property. If the stream was not navigable, ownership of the bed remained in the United States Government's hands until lands adjacent to the body of water were patented or

otherwise disposed of. At that time, the bed of the stream or lake to the middle became the property of the individual landowners on either side of the body of water.[1]

A. Purpose and Methodology

The purpose of this report is to examine what the Verde River was like at or before the time of Arizona's statehood in 1912 and to determine whether the stream prior to or on that date was considered commercially navigable or capable of such navigation. The chronological time period covered in this report extends from the pre-statehood era to the years shortly after Arizona joined the Union in 1912. The geographic range is from the Verde River's headwaters near Paulden, Arizona (about twenty-five miles north of Prescott) downstream to the Verde's confluence with the Salt River.

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 Verde River. To locate relevant sources, Littlefield Historical Research developed a preliminary list of terms for searching many local, state, and national archives. We also used the list to search published primary sources. The list was supplemented as research brought to light new topics related to the Verde River. Since individual archives have different means of listing their holdings, we adapted our list to accommodate specific locations. Some of the terms most commonly used throughout the research were Verde, Camp Verde, Fort Verde, McDowell, Apache, Jerome, Clarkdale, and Paradise Valley.

A lengthy list of Arizona and federal government agencies' names was also searched for records they may have generated regarding the Verde River. Agencies (and their predecessors) whose names were searched include the Arizona State Land Department, Arizona Attorney

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

General's Office, Arizona Water Commissioner, Arizona State Planning Board, Arizona Secretary of State, U.S. Congress, U.S. Geological Survey, U.S. Bureau of Land Management, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, U.S. Department of Agriculture (and its sub-agencies such as the Forest Service), U.S. Bureau of Indian Affairs, and the U.S. Army Adjutant General's Office, among others.

Research began at the Water Resources Center Archives at the University of California, Berkeley (which, since the time of the two predecessor reports, has been relocated to the University of California, Riverside). 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. Included are the papers of Elwood Mead (head of the U.S. Reclamation Service in the 1920s), James Dix Schuyler (a consulting engineering who was active in water resource development throughout the West in the late nineteenth century), and other participants helping to alleviate the water problems associated with the arid and semi-arid West.

The Water Resources Center Archives also holds many published government documents relating to water issues, including a complete set of published U.S. Geological Survey Water Supply Papers and Bulletins (many of which were relevant to the history of the Verde River Valley) as well as all of the U.S. Reclamation Service's annual reports published around the time of Arizona statehood.

The Bancroft Library, also at Berkeley, is one of the most important depositories for unpublished primary source materials and rare secondary source records on the history of the

American West. Collections at the Bancroft relating to the Verde 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 in relation to agriculture and water resources, their reports are especially useful to ascertaining the historical nature of the Verde River.

The University of California, Berkeley, was also the site of research on boating around the time of statehood. Published reports of the commissioner of corporations were searched to determine the state of technology on shallow-draft watercraft prior to and in 1912. Also examined were records and newspaper accounts 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 Verde River – around the turn of the century.

Berkeley is also a depository for all published federal government reports and studies, and since the university is one of the oldest in the West, its holdings are more complete than at many other universities in the region. Examined were a multitude of reports conducted by U.S. Government agencies regarding Arizona in general and the Verde River region more specifically. Most of these reports covered such topics as flood control, irrigation, and the utilization of various natural resources. These documents provided descriptions of the Verde at different points in time leading up to and shortly after Arizona's statehood. Some of the reports are specific to the Verde River, but much of the information found was contained in larger studies on Arizona. A computer search also was done of files compiled by Congressional Information Services (CIS) to find Congressional documents, hearings, and reports relevant to the Verde River.

In addition to the sources obtained at 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 Verde River around the time of statehood. The Bureau of Land Management holds the records of the original U.S. General Land Office surveys of the American West, and the Bureau's office in Phoenix has those relevant to the area through which the Verde River flows. The original surveys were carried out to prepare the public domain for homesteading and to ascertain what resources lay in the public domain. The records of the surveys, many of which were done in the nineteenth century, include the original surveyors' plats and field notes. These documents are highly detailed in relation to the characteristics of lands in the West, including along the Verde River. Since surveyors were required to "meander" all navigable bodies of water (follow the sinuosities of the banks) and to keep detailed notes of those meanders, survey documents are vital to understanding what the Verde was like at the time of survey. (See Chapter 1 for a more detailed discussion of how surveys and meanders were to be conducted.)

The Phoenix office of the U.S. Bureau of Land Management also provided copies of U.S. General Land Office Master Title Plats and Historical Indexes. These records were used to determine how the federal government disposed of the public lands in Arizona through which the Verde River flowed. From this material, any U.S. patent that either overlaid or bordered the Verde River was obtained. Federal patents are critical in determining how U.S. Government officials (in addition to federal surveyors) considered public lands in Arizona. If federal officials had considered the Verde River to be navigable, they would not have issued patents for lands lying in the bed of the river. There is no indication, however, in over 120 federal patents overlying the Verde River that the U.S. Government hesitated to grant title to the bed and the banks of the river to patent applicants. (See Chapter 2 for a more detailed discussion of the significance of federal patents.)

Federal patents and their supporting files, combined with historical maps obtained from the U.S. Geological Survey and U.S. General Land Office, were used to create Exhibits 1-6, which

illustrate the location of all patents and federal land grants along the Verde River. These maps appear in Chapter 2.

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

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. The Arizona State Land Department provided copies of patents issued by Arizona in parcels that had been granted to the state by the federal government. The corresponding application files for the state patents were also obtained and reviewed. (An exhibit map in Chapter 2 of this report illustrates the location of some of these state patents.)

The Salt River Project Archives in Phoenix was also a critical location for research. The Project has an extensive archival collection and an excellent collection of historical photographs. These materials were searched thoroughly, and copies of particularly demonstrative photos have been reproduced in Chapter 4 of this report. Since the completion of the earlier two reports, additional research in historical photographs also has been conducted in various locations, including at the Arizona Historical Society in Tucson and at the Sharlot Hall Museum in Prescott. Those new photographs also have been included in Chapter 4.

The documents and photographs found at the Salt River Project Archives were also useful as a lead-in to research at the U.S. National Archives in Washington, D.C. While at the National

Archives, a wide variety of federal agency files, including 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 U.S. Secretary of Interior, and the U.S. Geological Survey, were searched. These records contain unpublished paperwork substantiating and augmenting the conclusions gleaned from published government documents.

In relation to other unpublished federal records, the Rocky Mountain branch of the National Archives in Denver, Colorado, was also visited to undertake a more thorough search of records of the U.S. Bureau of Reclamation. These records provided a rich source of information and photographs from an agency directly involved with water resource management around the time of Arizona's statehood – an agency that had studied the Verde River extensively in preparation for possibly constructing a major irrigation project and dams utilizing the stream's flows.

Finally, since the completion of the earlier historical study of the Verde River's navigability, online historical newspaper collections capable of being key-word searched have provided a rich and extensive means of obtaining newspaper articles describing the Verde River at or before statehood. Many of these historical newspaper articles are discussed in this report.

B. Computer Database and Methodology

As noted above, the scope of research undertaken for this project was extensive. Many thousands of pages of records were reviewed on-site at various archives, libraries, and government agencies, and tens of thousands of pages of documents, photographs, and newspaper articles were copied for later in-depth study. To manage this comprehensive research, a computer database was utilized in the research and writing of this report. That process was undertaken in the following manner. Relevant documents located during research were abstracted into a database that could be sorted by subject matter, author, recipient, date, agency, or a wide variety of other possible

combinations. When research and abstracting were completed, that database was sorted by subject matter and date, and the results were transferred directly into a word processing program to provide a rough draft of this report. The use of the database not only facilitated correlating information and organizing the rough draft, but transferring the organized material from the database directly to the word processing program also ensured accuracy by avoiding transcription errors. The computer database also was used to record accurately the original sources for all underlying documents used in drafting this report, and the database kept track of the location of copies of those documents in the author's files.

C. Report Organization and Stylistic Notations

One of the principal functions of a historian is to review and summarize in an accurate manner large quantities of historical information to yield a detailed and understandable record of the past so that others may readily understand it without the need to read and analyze all of the underlying data. That concept is a basic goal of this report. It is also the responsibility of a historian to present the past in an objective manner, no matter how unpleasant those events may have been or how unpopular the outcome may be with regard to modern-day concerns. For that reason, the underlying documents in this study were used in such a manner as to allow those documents to tell their own story. This was done in the following manner. Summaries of documents were sometimes used to condense material into a useable length, yet wherever possible, direct quotations from the underlying documents – especially those of particular importance – were also employed.

It is common practice for professional and scholarly historians to use footnotes, and this report employs that methodology. Footnotes verify accuracy by citing the original sources or, if so desired, provide a means of beginning further research on various points discussed in the text. In this report, footnotes also specifically indicate materials relied upon. There are, however, the

following exceptions to the use of footnoting in this report. This overall "Introduction" as well as the final "Conclusion" section generally do not contain many footnotes because those sections of the report are synopses of everything contained in the intervening chapters. Documentation supporting the general statements found in this "Introduction" and in the "Conclusion" section can be found in the detailed paragraphs that appear within the individual chapters to this report. The same caveat applies to the introductory paragraphs and concluding paragraphs to each of the intervening chapters.

Individual footnotes appear at the end of phrases, sentences, or paragraphs indicating sources used for those statements. Where an individual footnote appears following several sentences or paragraphs, the note generally covers all of that material. Direct quotations are always provided with individual footnotes throughout this report. To facilitate ease of reference, the use of "ibid." and other terms denoting repetition of previously-cited sources has been eliminated and complete sources cited except in relation to repeated portions of citations within any given individual footnote. Also for simpler reference, footnote numbers run continuously throughout the entire report rather than using the conventional practice of starting each new chapter with footnote number 1.

D. Organization of Remainder of Report

Based on extensive research, it became evident that one of the most important sets of records dealing with the Verde River was the U.S. General Land Office original surveys and patent records. Therefore, the first two chapters of this report deal with the significance of those documents. Other U.S. Government records (both published and unpublished) are discussed in Chapter 3. Chapter 4 examines miscellaneous documents, newspaper reports, and historical photographs. Chapter 5 contains a discussion of boats typically used on western rivers around the

turn of the century. The last section of the report contains a general summary and conclusions. This is followed by an appendix containing the vita of this report's author, Douglas R. Littlefield.

CHAPTER 1: FEDERAL SURVEYS

One of the largest and most important groups of records created in relation to the Verde 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 (today, the Bureau of Land Management). When the United States became the owner of the vast territory acquired from Mexico at the end of the Mexican-American War in 1848, federal officials were anxious to determine the characteristics and value of what the U.S. had gained. Moreover, they wanted to prepare the region for orderly occupation by American settlers to solidify control over the region. To ready the new lands for homesteading and to record those lands' characteristics, the U.S. Government undertook formal surveys. Because those surveys were highly detailed, the original plats of the area near the Verde 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 during the nineteenth and early twentieth centuries designed to direct surveyors' work. It is important to understand the books' provisions and how they changed over time to grasp the significance of these manuals in relation to establishing whether bodies of water were deemed navigable or non-navigable.

1. The 1851 Manual

The 1851 version of *Instructions to the Surveyor General of Oregon: Being a Manual for Field Operations* governed how some of the earliest public land surveys were done in the American West. This manual had been adopted by the U.S. General Land Office to standardize survey work in California and Oregon, which were the most significant areas of western American settlement in

the late 1840s and early 1850s. 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 in the Southwest and opened under treaty with Great Britain in the Northwest; 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 would 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 small town at its center. Jefferson's ideas were first enacted into law in the *Land Ordinance* of 1785, and the first surveys under this legislation were done what is today the State of Ohio. The grid procedure (with various modifications) was used in most new territories added to the United States in the years that followed.

To establish township and range lines, a base line and meridian were chosen as starting lines within the state or territory to be surveyed. In Arizona, the initial base line and meridian intersected

[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).

at a point on a hill just south of the junction of Salt and Gila rivers. That location had been chosen in 1865 by John A. Clark, surveyor general of New Mexico Territory whose duties at the time included surveying Arizona Territory. The beginning marker originally had been established by the Mexican Boundary Commission in 1851 to create a point on the U.S.-Mexico border prior to the Gadsden Purchase of 1853, which created the present boundary between the United States and Mexico. Actual surveys did not begin in Arizona, however, until 1871.[3] Using the Gila and Salt River Base and Meridian to start, township and range lines were run in Arizona by federal surveyors working their way gradually north and south to create township lines and east and west to establish ranges. The 36 one-square-mile blocks that resulted were called townships (as distinct from township lines). They were numbered 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 Verde River from its confluence with the Salt River upstream to its headwaters – the lands surveyed under this rectangular survey system lay in townships 2 to 18 north and ranges 1 to 7 east and 1 to 2 west (the Verde crosses the Gila and Salt River Meridian). Simply translated, this means that the area of focus of this report is in the second through the eighteenth tiers of townships north of the Gila and Salt River Base and in the first through seventh tiers of townships east of the Gila and Salt River Meridian and the first and second tier of townships west of that meridian.

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

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

Surveyors laying out the township, range, and section lines were provided with very precise instructions for measuring these lines because accuracy was critical for these lands to be transferred out of the public domain in a reliable manner. In addition, for those areas remaining in the public domain, the precise rules for surveying and for noting the characteristics of the land gave the U.S. Government an extremely valuable record of what it owned through the field notes that surveyors were required to make. The field notes were to include any notable features of the land such as streams, rivers, lakes, roads, irrigation ditches, or other prominent landmarks. In addition, surveyors were to provide general descriptions of each township upon completing the survey of a township. Using their field notes, surveyors were then to draw and forward original survey maps to the surveyor general of the respective state or territory along with the accompanying field notes for final approval.

The *Instructions to the Surveyor General of Oregon* contained several provisions that are relevant to navigable bodies of water and other obstructions and therefore are important in relation to any consideration of the Verde 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.[4]

The *Instructions to the Surveyor General of Oregon* also provided that when surveyors encountered navigable bodies of water, special survey markers called "meander corner posts" were to be "planted at all those points where the township or section lines intersect the banks of such rivers, bayous, lakes, or islands, as are by law directed to be meandered."[5] Federal legislation directing that navigable bodies of water be set aside for public uses was first passed in 1796, but that law did not directly specify what constituted navigability. Nonetheless, the law provided that all navigable rivers:

> shall be deemed to be, and remain public highways, and that in all cases, where the opposite banks of any stream, not navigable, shall belong to different persons, the stream and the bed thereof shall become common to both.[6]

Therefore, where township, range, section, or fractional section lines encountered bodies of water, witness posts were to be established if those bodies were *not* navigable, but meander corner

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

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

[6] *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. 468 (1796).

posts were to be placed where the lines intersected navigable bodies of water. As the instructions explained, surveyors were to note:

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

The manual also provided that surveying lines that intersected navigable 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.][7]

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 directions of the edges of the banks were to be measured going downstream by recording degree bearings. The details of this meandering 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.[8]

Finally, as if these instructions were not specific enough, the *Instructions to the Surveyor General of Oregon* contained detailed examples of surveying notes so that field surveyors would understand virtually any type of circumstance they might encounter.[9]

2. The 1855 Manual

Between 1851 and 1864, the U.S. General Land Office published only a slightly revised version of the 1851 work. The 1855 manual (bearing the lengthy title *Instructions to the Surveyors*

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

[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. 442.

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

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) contained more detail than the 1851 instructions. Yet it remained virtually identical in substance with regard to recording navigable and non-navigable bodies of water.[10]

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

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

> 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.][11]

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[10] 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.

[11] The "statute" referred to is: *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. 468 (1796), discussed earlier in this chapter. *Instructions to the Surveyors General of the United States, Relating to Their Duties and to the Field Operations*

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. 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, surveyors were told that when they encountered obstacles such as ponds, swamps, lakes, rivers, and creeks, they were to use triangulation to establish the distance across those non-navigable obstacles on line. Also as in the 1851 and 1855 manuals, surveyors were to set a witness post on the line on each side of the 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

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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.

[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.

navigable lakes, you will mark the trees with the proper number of the fractional section, township and range." And similar to the 1851 and 1855 instructions, the 1881 manual provided that "[m]eander corners are established at all those points where the lines of the public surveys intersect the banks of such rivers, bayous, lakes, or islands as are by law directed to be meandered."[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 interchangeable with the previous work, including those for recording major obstacles. For example, the 1890 instructions about how to chronicle "insuperable objects on line" continued to provide that surveyors were to use triangulation to measure across the obstruction. Surveyors were still also instructed to set a witness post on line at the edge of non-navigable the obstacle, and to give the course and direction to two nearby trees on opposite

[14] The law referred to is: *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. 468 (1796), discussed earlier in this chapter. *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] The statute referred to is: *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. 468 (1796), discussed earlier in this chapter. *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.

sides of the line, each of which were to be notched and marked with a blaze facing the witness post. And, as had been the case in the 1855, 1864, and 1881 manuals, the 1890 directions also stated that for navigable bodies of water, meander posts were to be set where 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 manual had provided "under the statute." Instead, the 1890 instructions stated:

> Both banks of *navigable* rivers, as well as of all rivers not embraced in the class denominated as "navigable," the right angle width of which is *three chains* and upwards, will be meandered on *both* banks by taking the general courses and distances of their sinuosities, and the same are to be entered in the field book. Rivers not classed as navigable will not be meandered above the point where the average right-angle width is less than three chains. [Emphases in original.][17]

In short, there had been two changes to what should be meandered: 1) navigable bodies of water: 1881 – ("as are by law directed to be meandered" and "under the statute"; 1890 – "embraced in the class denominated as 'navigable'"), and 2) non-navigable streams (1881 – used for "internal communication," one bank to be meandered; 1890 – no reference to use for "internal communication," but more than three chains wide, both banks to be meandered).

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[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 what bodies of water were to be meandered. The new instructions still called for bodies of water "embraced in the class denominated 'navigable'" to be meandered. In addition, as had been the case in the 1890 manual, all non-navigable bodies of water that were more than three chains wide were to be meandered, but here the 1894 manual added an important instruction. Both navigable and non-navigable streams (more than three chains wide) were to be meandered "at the ordinary *mean high water mark*" (emphasis in original), and their general courses and sinuosities were to be recorded in the appropriate field notebook. Furthermore, in another significant change, the 1894 manual provided that "[s]hallow streams, without any well-defined channel or permanent banks *will not be meandered*; except tide-water steams, whether more or less than three chains wide, which should be meandered at ordinary high-water mark, as far as tide-water extends." (Emphasis in original.)[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 Surveying Manuals

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. Surveys along the Verde River

Prior to Arizona's statehood in 1912, various areas along the Verde 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 common), the field notes of the exterior surveys are of limited value to this report and will not be discussed here. Instead, the field notes of interior surveys and resulting plats will be examined in detail for information regarding surveyors' judgments and descriptions regarding the Verde River's navigability or non-navigability as well as its general characteristics.

[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 Verde River flows between the confluence with the Salt River and its headwaters were surveyed initially over a wide range of years, most of which were prior to statehood. Township surveys that took place before statehood were done in general beginning in the early 1870s. Resurveys of some townships before statehood were done in 1909 and 1911. 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 at least eight federal surveyors who mapped the Verde between the Salt and the Verde's headwaters prior to 1912 and while those surveys were done under the instructions of different survey manuals, at different times of year, and in different years, not one of the surveyors recorded information about the Verde River that would be consistent with a determination of navigability.

Because of the importance of these initial federal surveys in relation to establishing the nature of the Verde River, they will be discussed in detail here, and in general, the discussion will be in an up-river manner. Since surveyors' notes were compiled in the field as surveys were undertaken, and plats were later drawn based on the notes, the notes for each township survey will be discussed first followed by the corresponding plats. A large number of the pre-1912 field notes and plats for townships along the Verde above the Salt River have been reviewed. A few were illegible or non-existent, and a significant portion of the townships were either surveyed after 1912 or were never surveyed at all due to the difficulty of the terrain, their inclusion within national forests or Indian reservations, or their unsuitability for settlement. In addition, the notes and plats for township 17 north, range 1 east, and township 17 north, range 2 west, were not reviewed because they were not available when this report was drafted. Both of these townships, however, contain only very small segments of the Verde River. Because of the length of the Verde River and because in many cases adjacent township interior subdivisions were done by the same surveyor who

applied the same standards and used the same terminology to describe the stream, only representative samples of the extant pre-1912 subdivision surveys will be discussed here. Nevertheless, the conclusions presented in this discussion of federal surveys and what they reveal about the nature of the Verde River derive from many more surveys than are discussed here.

1. 1911 Subdivision Survey of Township 2 North, Range 7 East

The most downstream portion of the Verde River where it meets the Salt River lies in the northern part of section 5, township 2 north, range 7 east. On January 25, 1911, Robert A. Farmer meandered both banks of the Verde River in this township as part of his survey of the Salt River Indian Reservation boundary. The meanders of the both banks of the Verde are recorded in Farmer's field notes of the survey and are shown on the plat of this survey.[22] The meanders, however, were not done as a result of Farmer's determination that the Verde River was navigable. Instead, Farmer's meanders were consistent with the instructions of the 1890 survey manual, as continued in the 1894 and 1902 manuals that:

> [b]oth 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. [Emphases in original.][23]

Farmer's field notes and his plat, shown below, clearly demonstrate that the reach of the Verde River in this township was considerably wider than three chains, and the stream thus met the criteria for meandering non-navigable bodies of water. That Farmer's treatment of the Verde

[22] Robert A. Farmer, "Field Notes of the Survey of the Subdivision of T. 2 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," pp. 11-17, approved by the commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona; Farmer, Plat of Township 2 North, Range 7 East, Gila and Salt River Meridian, Arizona, approved by the commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[23] *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.

was based on the instructions to meander non-navigable bodies of water over three chains wide and not on the requirement to meander navigable streams and lakes will be more evident by his assessment of the Verde in the next township to the north, which is discussed below.

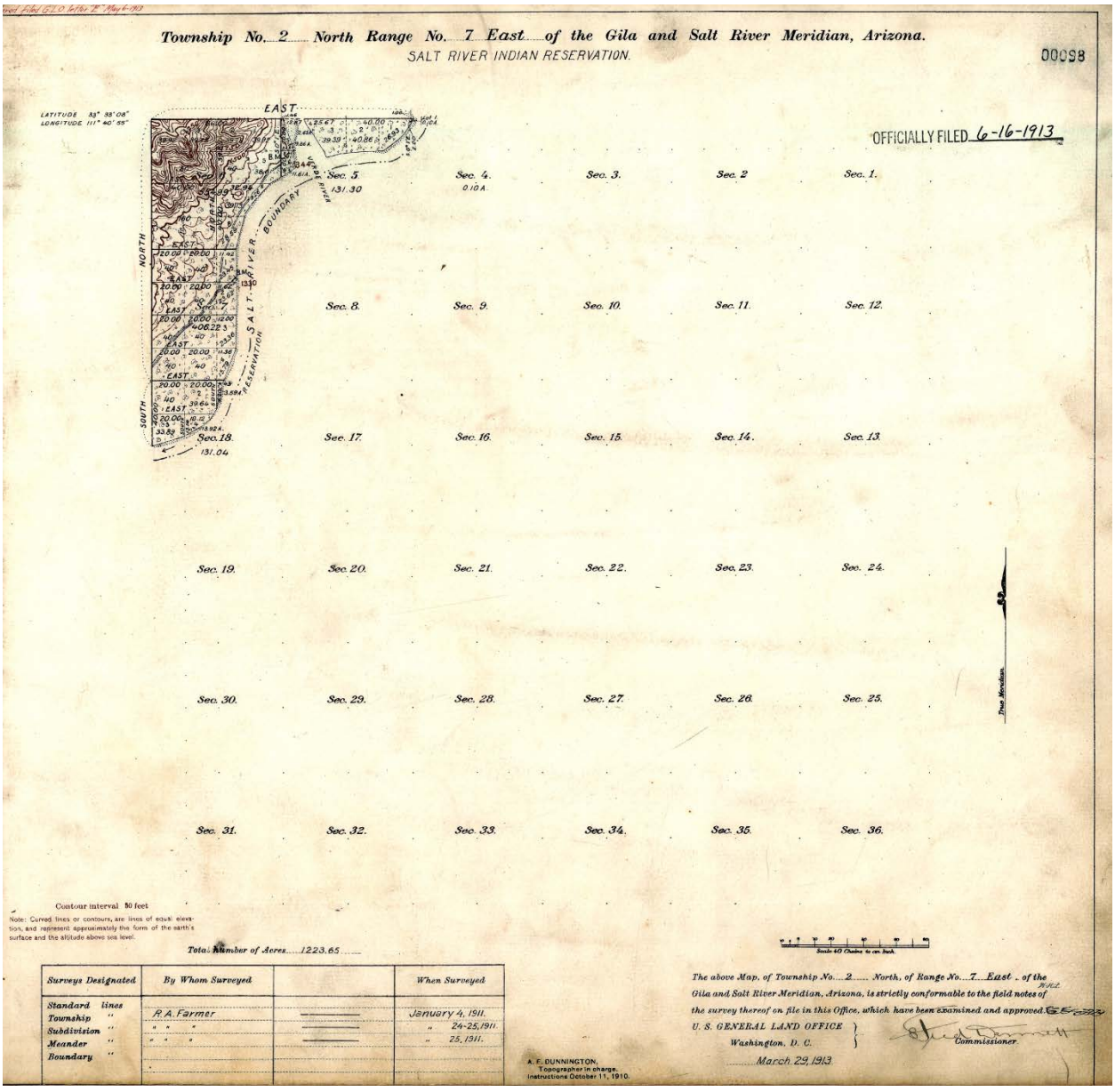

Figure 1: Survey plat of township 2 north, range 7 east, by Robert A. Farmer; approved by the surveyor general in 1913. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

2. 1902 Subdivision Survey and 1911 Subdivision Resurvey of Townships 3 and 4 North, Range 7 East

The southern part of township 3 north, range 7 east, through which the Verde River flowed was not surveyed for subdivision lines because it was within the original boundaries of the Salt River Indian Reservation. However, the portion of the township north of the Indian reservation and the part of township 4 north, range 7 east (both of which lay within the abandoned Fort McDowell Military Reservation) were surveyed in 1902 by Philip Contzen and resurveyed in 1911 by Robert Farmer. Township 3 north, range 7 east, will be discussed here as representative of the two townships.

Both the original survey and the resurvey of these townships clearly indicated that the Verde River had been meandered. Yet, as was the case in the township downstream, the meanders had been undertaken by Contzen and Farmer based on the 1890 instruction to meander non-navigable bodies of water more than three chains wide. This can be determined from other information available in the plats and notes by Contzen and Farmer. For example, Contzen's general description of township 3 north, range 7 east, pointed out that the former military reservation:

> is well watered by the Verde River, which carries an abundance of water, making irrigation successful. . . . There is [*sic*] quite a number of settlers in the Verde Valley who have made substantial improvements and have land under cultivation.[24]

Although Contzen specifically recorded the "abundance of water" in the Verde River, he made no observations of any features suggesting navigability. On the contrary, his 1902 plat of township 3 north, range 7 east (see below), indicated the presence of two roads paralleling the stream, one on each side of the river. The presence of roads adjacent to the stream implies a lack of

[24] Philip Contzen, "Field Notes of the Subdivision of Fort McDowell Field," pp. 237-239, vol. R1788, approved by the U.S. surveyor general July 22, 1902, U.S. Bureau of Land Management, Phoenix, Arizona.

navigability. Second, the plat noted irrigation ditches heading on both banks of the stream but carried no suggestion of wharves, docks, or other features associated with navigation.[25]

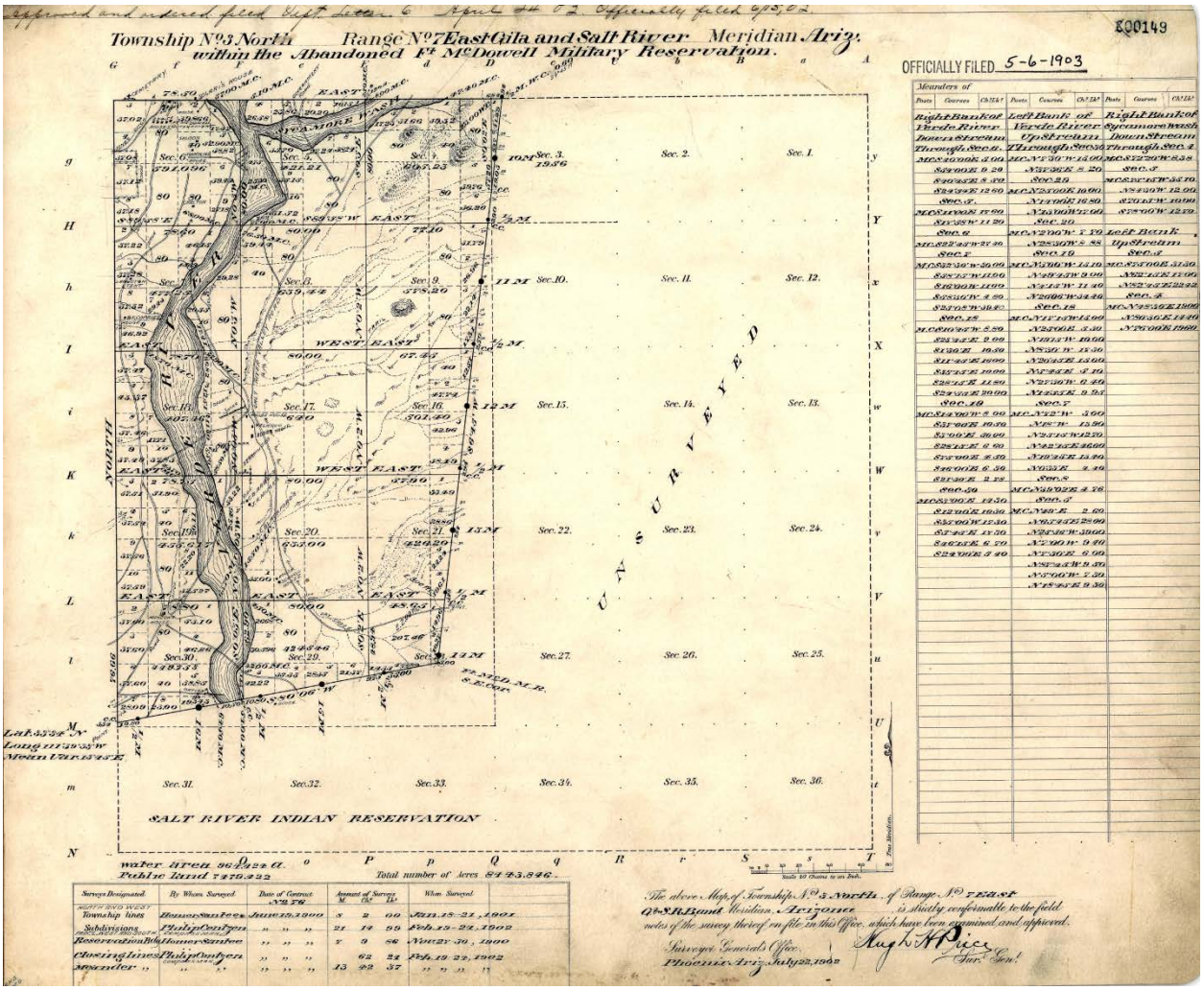

Figure 2: Survey plat of township 3 north, range 7 east, by Philip Contzen; approved by the surveyor general in 1902. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

Robert Farmer's resurvey of the former Fort McDowell Military Reservation in February and March 1911 confirmed Contzen's treatment of the Verde as being non-navigable (see below for

[25] Philip Contzen, "Plat of Township 3 North, Range 7 East, Gila and Salt River Meridian within the Abandoned Fort McDowell Military Reservation," approved by the U.S. surveyor general on July 22, 1902, U.S. Bureau of Land Management, Phoenix, Arizona.

Farmer's plat). Farmer's field notes of townships 3 and 4 north, range 7 east, recorded the placement of meander corners on the Verde in a manner consistent with the 1890 surveying instructions calling for meanders of non-navigable bodies of water that were more than three chains wide. At nearly every intersection with the river, Farmer routinely noted the width of the bed of the river as well as the distance across the channel of water that lay within the bed itself. In nearly each instance, both the bed and the channel were well over three chains wide.[26] In addition, Farmer's description of the Verde at places where survey lines intersected that stream denoted a river that would be difficult to navigate. For example, while running the line north between sections 31 and 32, he first set a meander corner on the right bank. He then wrote:

> 3.36 [chains] Enter shallow channel of Verde River, 1 ft. deep, course SE. 8.00 [chains] Leave channel; thence across sand bar, parallel to bank. 15.00 [chains] The right bank of main channel, course SE. 21.90 [chains] The left bank of Verde River, 8 ft. high.

Here, he set another meander corner.[27] Comparable descriptions of sand bars and shallow water were offered throughout the remainder of the field notes of this survey.[28] Farmer also wrote in his field notes that he "did not attempt to run line bet. secs. 5 and 6, from the temp. cor. of secs. 5, 6, 7 and 8, on sand bar, as this entire line was in river channel and on sand bar; and it was impracticable to [go] up the channel on account of high water."[29] Later in the notes, he added:

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[26] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," pp. 4, 6, 7, 9, 11, 16, 19, 21, 23, 24, 27, 29, 32, 36, 39, 49, 50, vol. R2396, approved by the commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[27] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," pp. 1C-2, vol. R2396, approved by the commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[28] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," pp. 4, 6, 7, 9, 11, 16, 19, 21, 23, 24, 27, 29, 32, 36, 39, 49, 50, vol. R2396, approved by the commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[29] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," p. 40, vol. R2396, approved

> NOTE: The line bet. secs. 29 and 30 was run at a time when the water in the river was very low, and it was possible to run on the sand bar, and set temp. 1/16 sec. cors. Nos. 6 and 12, and 1/4 sec. cor., bet. secs. 29 and 30. When the lines through the S 1/2, middle, and N 1/2 of sec. 29 were run, the high water had come, and it was impossible to reach 1/16 and 1/4 sec. cors.; therefore, these lines were run West, on true lines.[30]

Finally, in the general description of the township, Farmer observed that there was a considerable degree of variation in the Verde River's depth of flow. As he explained, "[a]t the time of survey, it [the Verde River] was very low, being from 2 1/2 to 4 ft. deep."[31]

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by the commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[30] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," p. 53, vol. R2396, approved by the commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

[31] Robert A. Farmer, "Field Notes of the Survey of the Subdivision and Meanders of T. 3 N., R. 7 E., Salt River Indian Reservation, of the Gila and Salt River Principal Meridian in the State of Arizona," p. 102, vol. R2396, approved by the commissioner of the U.S. General Land Office March 29, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

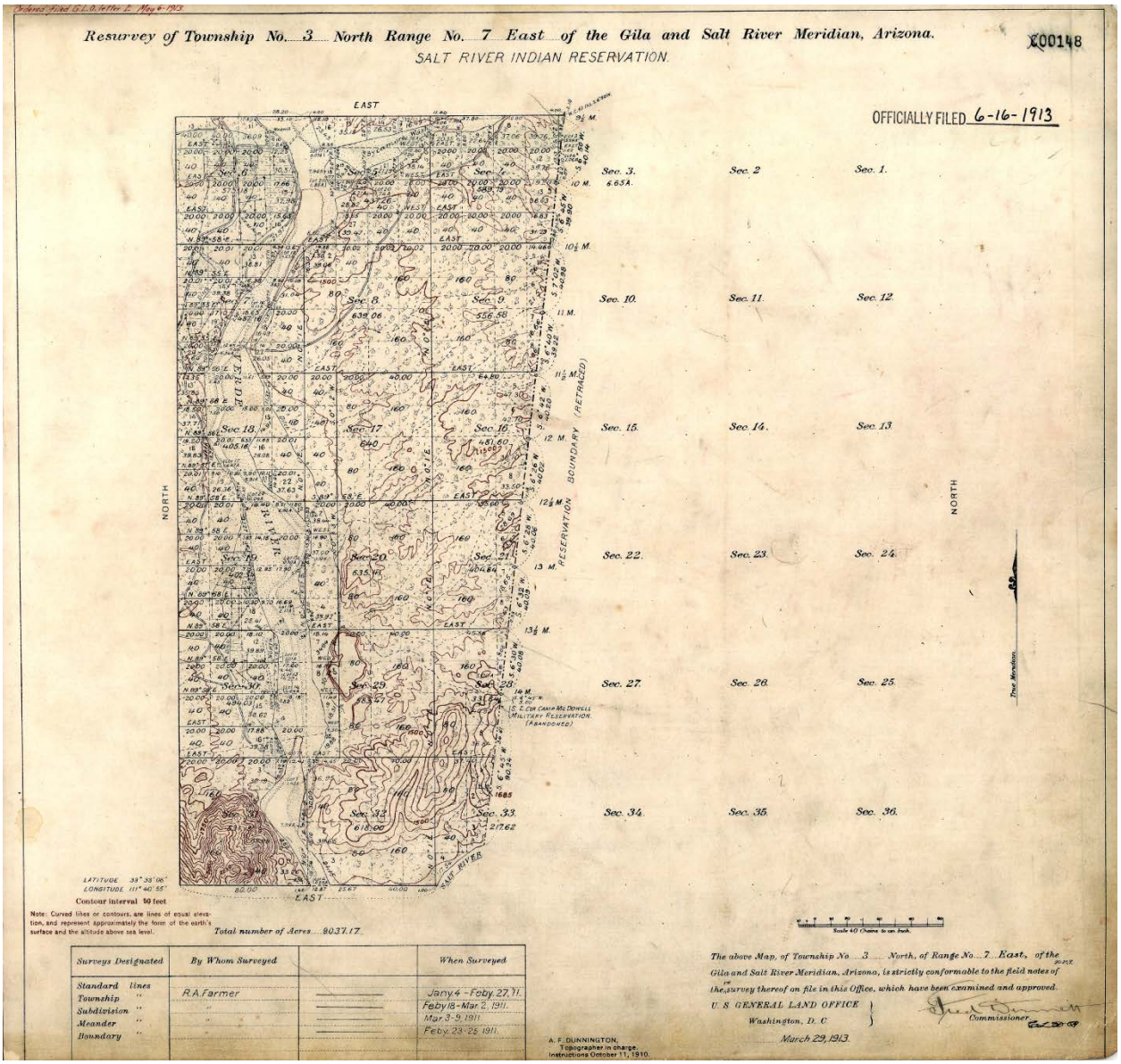

Figure 3: Re-survey of township 3 north, range 7 east, by Robert A. Farmer; approved by the surveyor general in 1913. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

3. 1873 Subdivision Survey of Township 13 North, Range 5 East; 1877 Subdivision Surveys of Townships 14-15 North, Range 4 East; and 1877 Subdivision Surveys of Townships 15-16 North, Range 3 East

The townships along the Verde River between township 4 north, range 7 east, and township 13 north, range 5 east, either were surveyed after 1912 and therefore provide little useful

information about the stream before Arizona statehood, or were never surveyed at all due to the rugged terrain and their inclusion in national forests.[32]

The next area relevant to this survey study, therefore, is township 13 north, range 5 east, the area near present-day Camp Verde. Part of this township, including that portion of the Camp Verde Military Reservation (today, Fort Verde State Historic Park) within the township, was surveyed in 1873 by C. Burton Foster. Four years later, Foster also carried out subdivision surveys of parts of townships 14-15 north, range 4 east, and townships 15-16 north, range 3 east – other areas of significant settlement in the Verde Valley. Because Foster's treatment and descriptions of the Verde River were comparable in all of these surveys, only his work in township 13 north, range 5 east, will be discussed here.

Between December 2 and 6, 1873, Foster surveyed the subdivision lines of township 13 north, range 5 east, but he undertook no meanders of the Verde River. His failure to establish meander corners and to not meander the stream was consistent with instructions set forth in the 1864 surveying manual that only navigable bodies of water were to be meandered on both banks. In general, his commentary when he encountered the stream was limited to a statement that it was about one chain wide, and it had a gentle current and sandy bottom.[33] Further upstream and four years later, while Foster undertook no meanders and his descriptions were roughly the same about the Verde, he did take note of a dam crossing the river.[34]

[32] Going upstream, these include townships 5-7 north, range 7 east; townships 7-11, range 6 east; township 11 north, range 7 east; township 12 north, range 6 east; township 12 north, range 5 east; and township 12.5 north, range 4 east.

[33] C. Burton Foster, "Field Notes of the Subdivision Lines of Fractional Township 13 North, Range 5 East, Gila and Salt River Meridian, Territory of Arizona," pp. 1, 17, 27, 31, 32, 48, 51, 52, 59, 62, 65, vol. R137, approved by surveyor general July 1, 1874, U.S. Bureau of Land Management, Phoenix, Arizona.

[34] The dam was in township 16 north, range 3 east. See C. Burton Foster, "Field Notes of the Subdivision Lines of Fractional Township 16 North, Range 3 East, Gila and Salt River Meridian," p. 27, vol. R217, approved by the surveyor general Dec. 27, 1877, U.S. Bureau of Land Management, Phoenix, Arizona.

Foster's general description of township 13 north, range 5 east, included the following description of the Verde:

> The Rio Verde flowing through the Tp.in a S.E. direction is a stream with banks about 3 feet high and of uniform width. The amount of water flowing with gentle current through its channel at an average depth of about 3 feet varies but little during the different seasons of the year and seldom overflows its banks.

He also observed that there were several farms on the east side of the river, using water from the Verde and from Clear Creek for irrigation, and he added that there was "in process of construction a large ditch to irrigate the valley lands in Tp. on the W. side of the Rio Verde."[35]

The plat of township 13 north, range 5 east (see below), showed the Verde River flowing in a southeasterly direction, a portion of which was through the Camp Verde Military Reservation. There is no indication on the plat that Foster meandered the Verde River. No meander lines appear on the plat; no meander data appear in the margins; and no surveyor is listed as having undertaken meanders. Aside from the lack of meanders, there is another indication on the plat that Foster did not consider the Verde River to be navigable – he noted what he labeled as a hay road running parallel to the river. The road suggests that the river was not used for commercial transportation.[36]

[35] C. Burton Foster, "Field Notes of the Subdivision Lines of Fractional Township 13 North, Range 5 East, Gila and Salt River Meridian, Territory of Arizona," pp. 73-76, vol. R137, approved by surveyor general July 1, 1874, U.S. Bureau of Land Management, Phoenix, Arizona.

[36] C. Burton Foster, "Plat of Township 13 North, Range 5 East, Gila and Salt River Meridian, Arizona," approved by the surveyor general on July 1, 1874, U.S. Bureau of Land Management, Phoenix, Arizona.

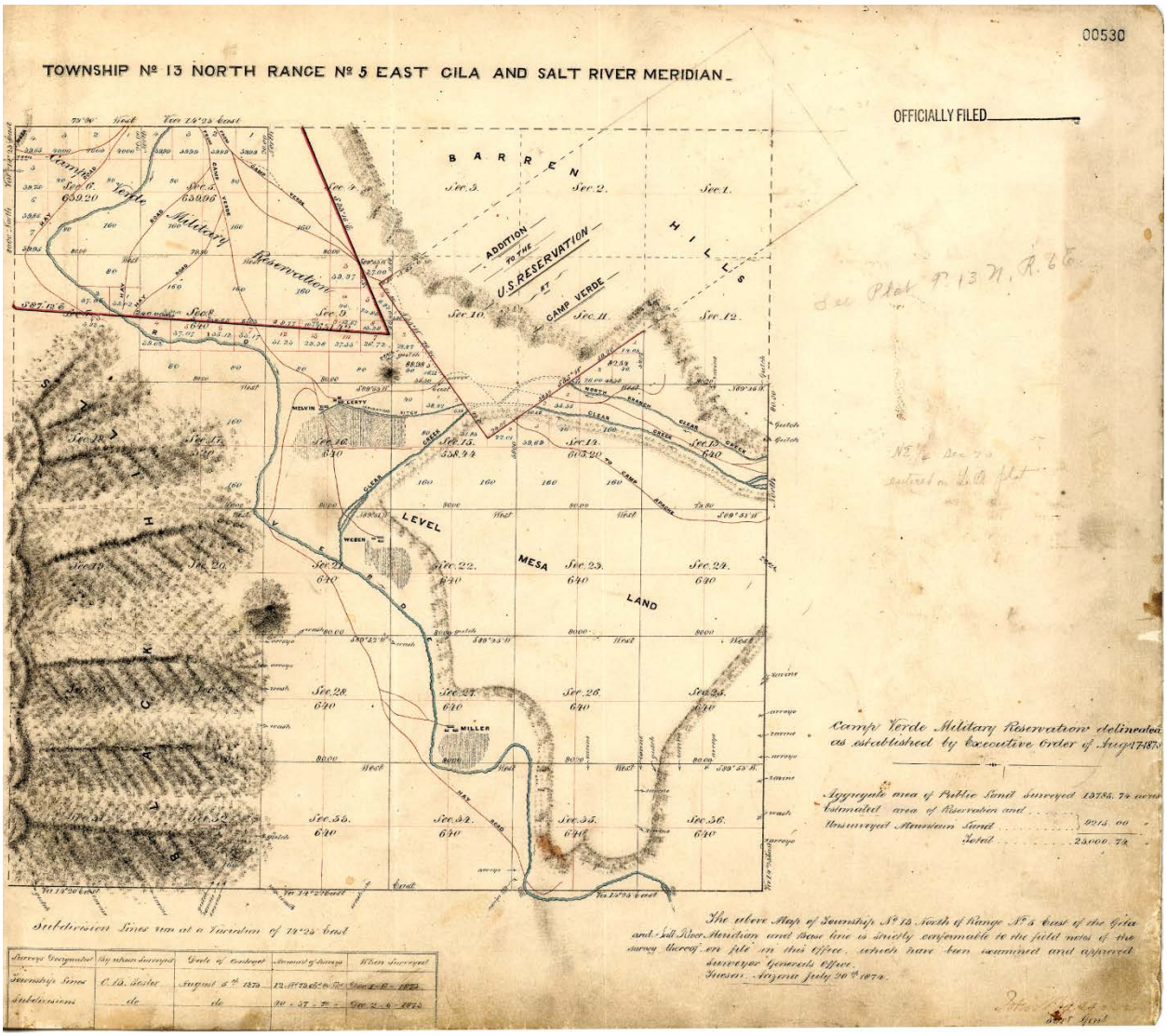

Figure 4: Survey plat of township 13 north, range 5 east, by C. Burton Foster; approved by the surveyor general in 1874. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

4. 1892-1893 Subdivision Survey of Townships 13-14 North, Range 5 East, and Township 14 North, Range 4 East

Between December 29, 1892, and January 5, 1893, Daniel Drummond surveyed the interior areas of the Camp Verde Military Reservation within townships 13-14 north, range 5 east, and township 14 north, range 4 east. Some, but not all, of this area had been surveyed originally by

Foster in 1873 and 1877. Because Drummond's descriptions and treatment of the Verde were similar in all three townships, only township 13 north, range 5 east, will be discussed here.

Drummond's survey had been conducted under the directions in the 1890 federal surveyors' manual directing surveyors to meander navigable bodies of water as well as streams over three chains wide that were not navigable. Under the directions for non-navigable bodies of water over three chains wide, Drummond clearly established meander corners at each intersection with the Verde, and he noted in most cases that the stream was considerably wider than three chains.[37] In his general description of the township, Drummond wrote:

> The Verde River is a fine stream of living water flowing through the Reservation from north to south and contains ample water for the purposes of irrigation. The high flood of Feby. 1891 has washed several hundred acres of fine bottom land, leaving in its stead stones, rocks, and gravel, forming the present bed of the river. Since the flood the banks of the river average a width of nearly 20 chains.[38]

Drummond's repetitive notation in the field notes that the Verde River was greater in width than three chains indicate that the basis for his meanders stemmed from the instructions to meander non-navigable bodies of water over three chains across. This conclusion is substantiated by the indication on the plat for Drummond's survey, which covered all three townships in that survey (see below). That plat noted that a major irrigation ditch lay on the west side of the river. Another smaller ditch took water at a diversion dam in township 14 north, range 5 east, and it flowed south into township 13 north, range 5 east. In addition, roads roughly paralleled the stream through all three townships.[39]

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[37] Daniel Drummond, "Field Notes of the Resurvey of the Camp Verde Military Reservation, Arizona," pp. 13-18, vol. R2020, approved by the surveyor general on April 21, 1893, U.S. Bureau of Land Management, Phoenix, Arizona.

[38] Daniel Drummond, "Field Notes of the Resurvey of the Camp Verde Military Reservation, Arizona," pp. 130-131, vol. R2020, approved by the surveyor general on April 21, 1893, U.S. Bureau of Land Management, Phoenix, Arizona.

[39] Daniel Drummond, "Survey Plat of Camp Verde Military Reservation, Arizona," approved by the surveyor general in 1893, U.S. Bureau of Land Management, Phoenix, Arizona.

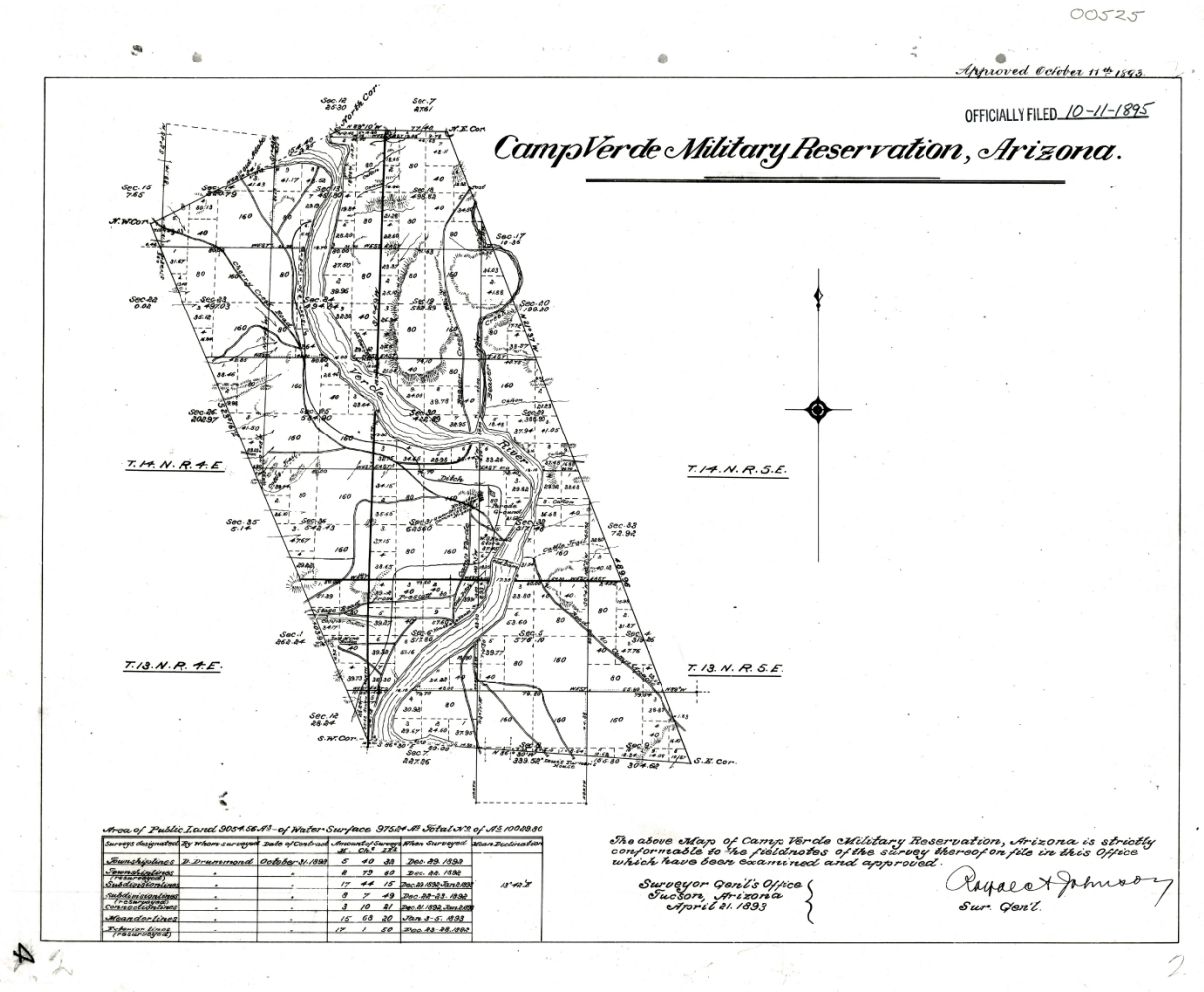

Figure 5: Survey plat of the interior parts of Camp Verde Military Reservation by Daniel Drummond; approved by the surveyor general in 1893. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

5. 1907 and 1908 Subdivision Survey of Township 17 North, Range 3 East

Between December 16 and 20, 1907, and approximately a year later, Jesse B. Wright undertook the first survey of part of the interior subdivision lines of township 17 north, range 3 east – the area just upstream on the Verde River from townships originally surveyed thirty years earlier by C. Burton Foster. The federal surveyors' manual that directed how Wright was to carry out his survey was the 1902 edition, which instructed surveyors to meander navigable bodies of water as well as non-navigable watercourses that were more than three chains wide. Nevertheless, Wright

undertook no meanders of the Verde in this township, indicating both that he did not consider the stream to be navigable as well as the fact that in most of the places he encountered the Verde River, that stream was less than three chains wide.[40]

Wright's general description of the township, located at the end of his survey notes, included this commentary on the Verde River:

> The soil along the Verde river is very fertile, and there is much valuable land lying within the surveyed section, which could be irrigated, from the ample supply of water in the Verde river. The western portion of the Tp. is very rough, broken by deep cañons and gulches leading to the Verde river, as is also the northeastern portion of Tp.[41]

Not only did Wright's field notes suggest the Verde River to be non-navigable, but so too did the plat of the township (see below). No meander lines appear along the Verde's banks, and in a table on the right margin of the plat labeled "Meanders of," no meander data were entered. Furthermore, in a table at the bottom of the plat identifying which parts of the interior subdivision, exterior lines, and meanders were undertaken by various surveyors, no one is identified as having done meander surveys. Finally, also suggesting that the Verde River was not used for carrying commerce is the presence of a road roughly paralleling the river.[42]

[40] Jesse B. Wright, "Field Notes of the Partial Subdivision of T. 17 N., R. 3 E. of the G. & S.R.B. & Meridian, Arizona," pp. 5, 6, 8, vol. R2145, approved by the surveyor general on Sept. 16, 1909, U.S. Bureau of Land Management, Phoenix, Arizona.

[41] Jesse B. Wright, "Field Notes of the Partial Subdivision of T. 17 N., R. 3 E. of the G. & S.R.B. & Meridian, Arizona," p. 9, vol. R2145, approved by the surveyor general on Sept. 16, 1909, U.S. Bureau of Land Management, Phoenix, Arizona.

[42] Jesse B. Wright, "Plat of Township 17 North, Range 3 East, Gila and Salt River Meridian, Arizona," approved by the surveyor general on Sept. 16, 1909, U.S. Bureau of Land Management, Phoenix, Arizona.

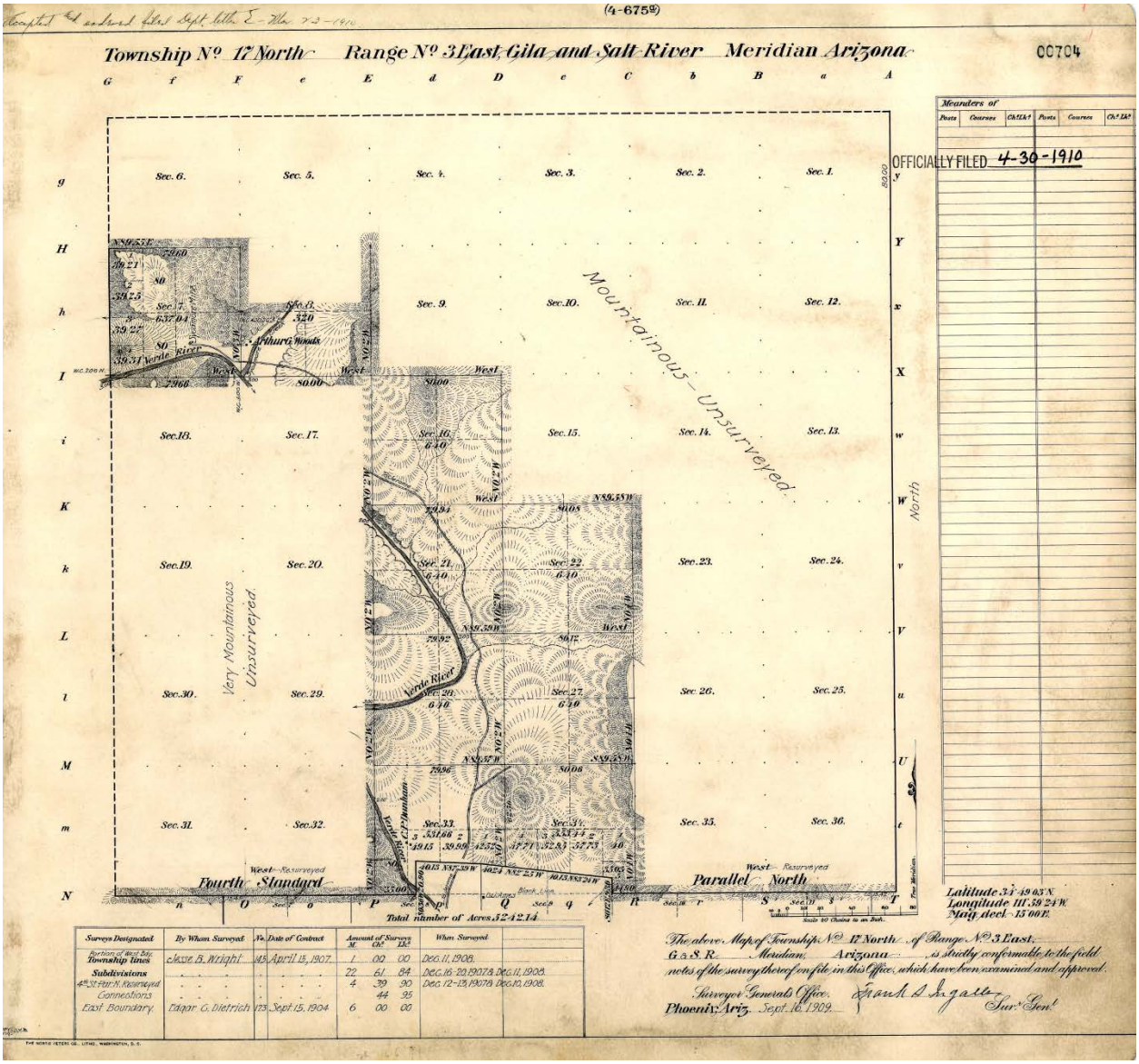

Figure 6: Survey plat of township 17 north, range 3 east, by Jesse B. Wright; approved by the surveyor general in 1909. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

6. 1902 Subdivision Survey of Township 18 North, Range 2 East

Because the interior subdivision lines to township 17 north, range 2 east (the next township upstream on the Verde River) were not surveyed until 1956, the subsequent relevant township to this study is township 18 north, range 2 east. This township was surveyed by James B. Girand in

the summer of 1902. The Verde River flowed through the southwest corner and crossed just the line between sections 31 and 32 before exiting on the western edge of the township. When Girand encountered the Verde River on this line, his field notes suggest that his assessment of the stream was that it was non-navigable. Not only did he not establish meander corners, but due to the difficulty of the terrain, he had to improvise to estimate the distance across the stream as being eighty links (4/5 of a chain) wide. While it is impossible to determine whether Girand was relying upon the new 1902 manual of surveying instructions, which had been released on January 1, 1902, or the previous 1894 manual, in either case he would have been required to establish meander corners for navigable bodies of water as well as non-navigable streams over three chains wide. Therefore, his failure to establish meander corners indicated that he believed the stream to be a non-navigable watercourse less than three chains wide. His only comment about the river in the general description of the township was to observe: "The S.W. portion of this township is well watered [by] the Verde River running through it, and the water is clear and pure."[43]

Girand's plat of the township (see below) likewise carried no intimation that the Verde was navigable. Not only do no meander lines appear along the river, but there is no listing for a surveyor who might have done meanders. Furthermore, in the right margin in a table entitled "Meanders of," there is no meander data entered there.[44]

[43] James B. Girand, "Field Notes of the Survey of the Subdivision Lines of Township No. 18 North, Range No. 2 East, of the Gila and Salt River Base and Meridian in the Territory of Arizona," pp. 19, 46-47, vol. R237, U.S. Bureau of Land Management, Phoenix, Arizona.

[44] James B. Girand, "Plat of Township 18 North, Range 2 East, Gila and Salt River Meridian, Arizona," approved by the surveyor general on Jan. 23, 1903, U.S. Bureau of Land Management, Phoenix, Arizona.

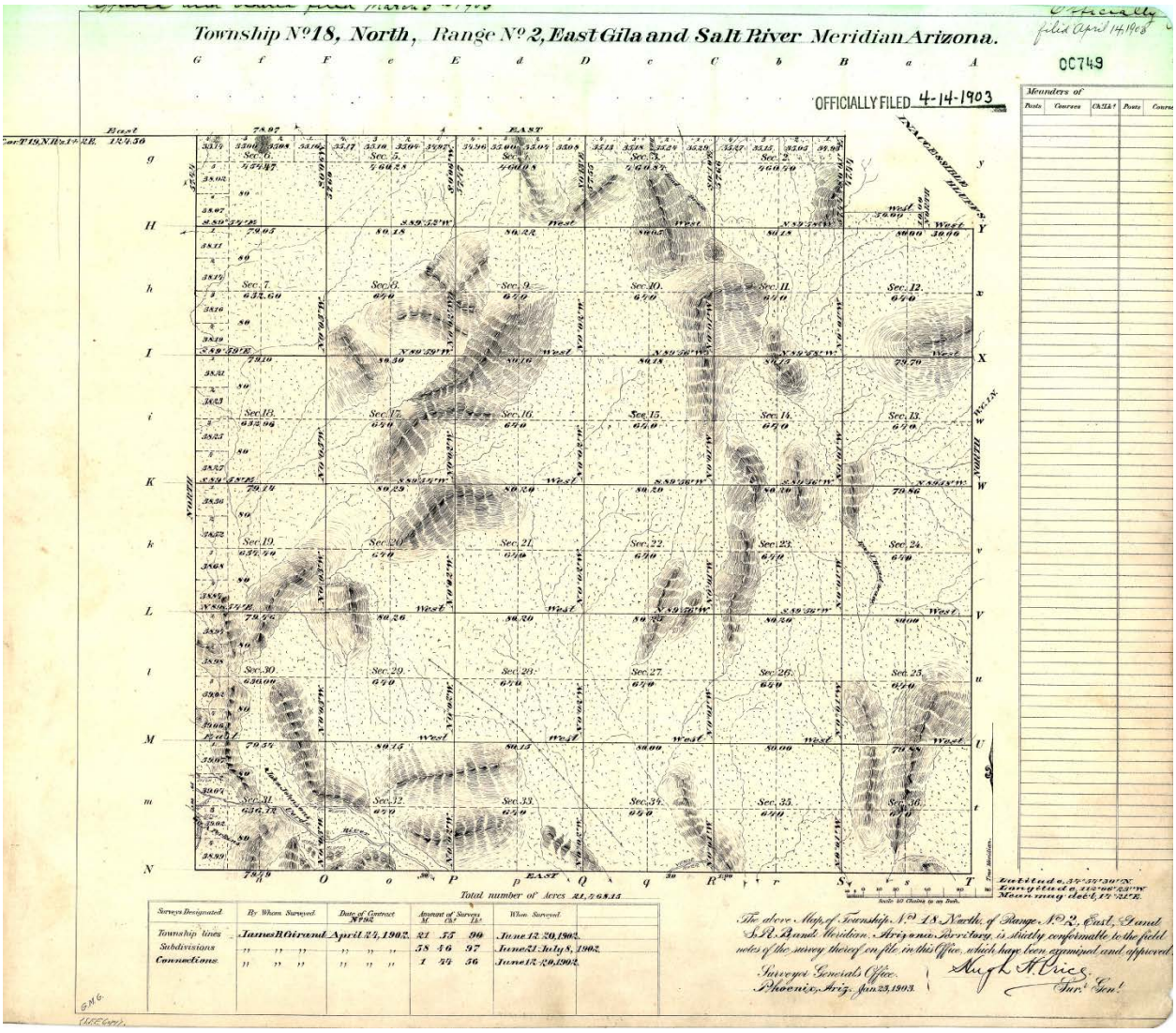

Figure 7: Survey plat of township 18 north, range 2 east, by James B. Girand; approved by the surveyor general in 1903. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

7. 1902 Subdivision Survey of Township 18 North, Range 1 East

Continuing upstream, between February 8 and 18, 1903, John F. Hesse surveyed the interior subdivision lines of township 18 north, range 1 east. The Verde River ran through the southern portion of the township, but there is no indication that Hesse thought the stream was navigable. Hesse undertook no meanders of the stream, and at each encounter he simply measured the distance across and gave the stream's direction of flow. In general, the Verde was considerably smaller than

three chains wide, and thus his treatment of the stream was consistent with the 1902 federal surveyors' manual's instructions not to meander bodies of water if they were less than three chains in width or if they were non-navigable.[45] Similarly, no meander lines appear on the plat (see below); no meander data is recorded in the margin; and no surveyor is listed as having undertaken meander surveys.[46]

[45] John F. Hesse, "Field Notes of the Survey of the Subdivision Lines of Township 18 North, Range 1 East, of the Gila and Salt River Base and Meridian in the Territory of Arizona," pp. 1H, 20, 40, vol. R234; pp. 78, 80, vol. R235, approved by the surveyor general April 23, 1904, U.S. Bureau of Land Management, Phoenix, Arizona.

[46] John F. Hesse, "Plat of Township 18 North, Range 1 East, Gila and Salt River Meridian, Arizona," approved by the surveyor general April 23, 1904, U.S. Bureau of Land Management, Phoenix, Arizona.

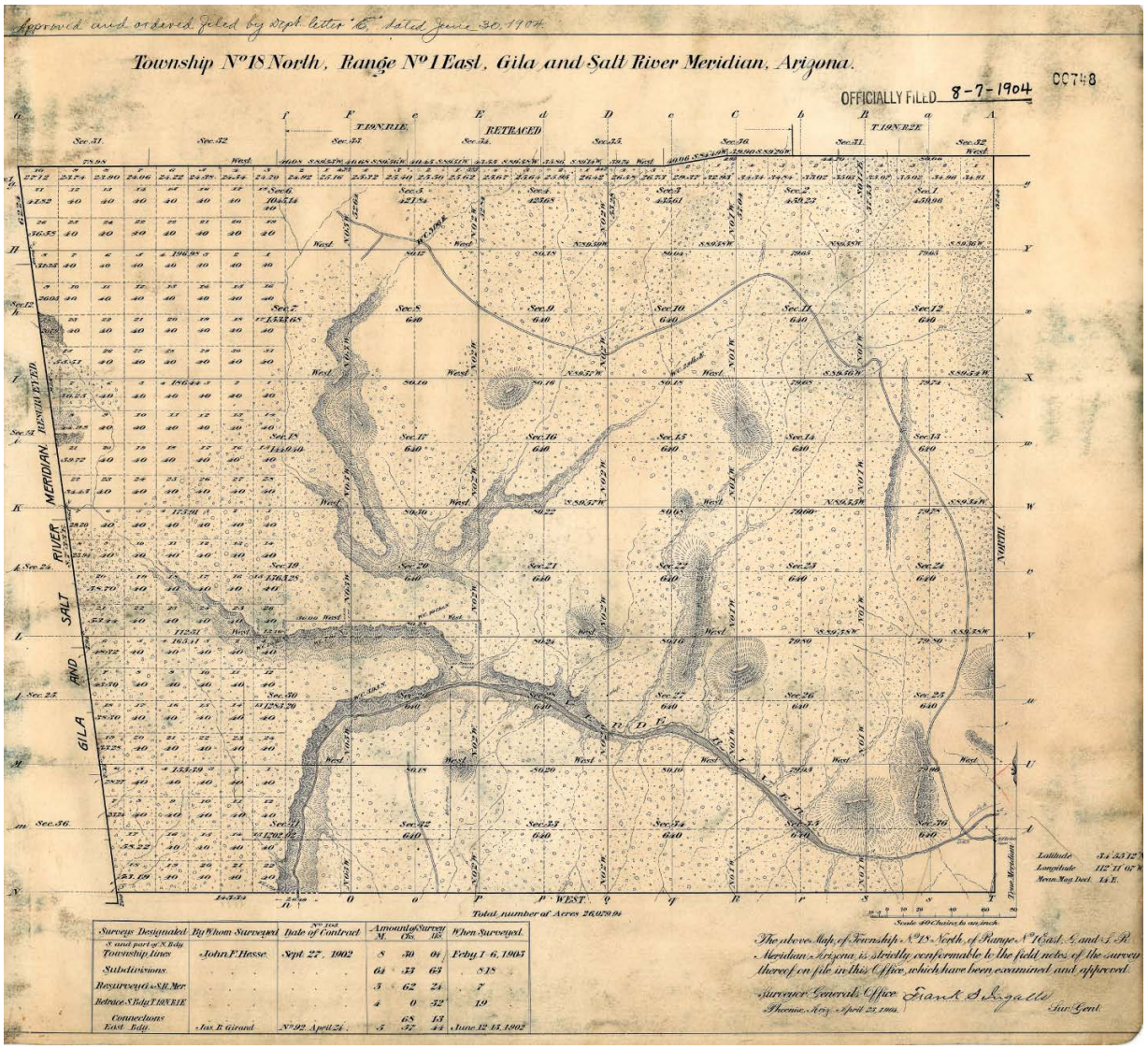

Figure 8: Survey plat of township 18 north, range 1 east, by John F. Hesse; approved by the surveyor general in 1904. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

8. 1883 Subdivision Surveys and 1909 Resurveys of Townships 17 and 18 North, Range 1 West

J.T. Smith surveyed the interior subdivision lines of townships 17 and 18 north, range 1 west, in September 1883. These townships were also resurveyed by Alfred N. Oliver in May and June 1909. The notes and plats of these surveys, which would have been done under the directions of the 1864 and 1902 manuals, confirm both surveyors' assessments of the Verde River being a

non-navigable stream. No meander data appear in any of the notes, and none appear on the plats (see below for the plats).[47]

[47] J.T. Smith, "Field Notes of the Survey of the Subdivision Lines of Township 17 N. Range 1 W., Gila and Salt River Base and Meridian, Arizona," approved by the surveyor general Feb. 13, 1884, U.S. Bureau of Land Management, Phoenix, Arizona; Smith, "Plat of Township 17 North, Range 1 West, Gila and Salt River Meridian," approved by the surveyor general Feb. 13, 1884, U.S. Bureau of Land Management, Phoenix, Arizona; Smith, "Field Notes of the Survey of the Subdivision Lines of Township 18 N., Range 1 W., Gila and Salt River Base and Meridian, Arizona," approved by the surveyor general Feb. 13, 1884, U.S. Bureau of Land Management, Phoenix, Arizona; Smith, "Plat of Township 18 North, Range 1 West, Gila and Salt River Meridian," approved by the surveyor general Feb. 13, 1884, U.S. Bureau of Land Management, Phoenix, Arizona; Alfred N. Oliver, "Field Notes of the Survey of the Private Claim Lines and Resurvey of the Subdivision Lines of Tps. 17 N., Rg. 1 W. of the Gila and Salt Rive Meridian, Territory of Arizona," approved by the surveyor general April 27, 1910, U.S. Bureau of Land Management, Phoenix, Arizona; Oliver, "Plat of Township 17 North, Range 1 West," approved by the surveyor general April 27, 1910, U.S. Bureau of Land Management, Phoenix, Arizona; Alfred N. Oliver, "Field Notes of the Survey of the Private Claim Lines and Resurvey of the Subdivision Lines of Tp. 18 N., Rg. 1 W., of the Gila and Salt River Meridian, Territory of Arizona," approved by the surveyor general April 27, 1910, U.S. Bureau of Land Management, Phoenix, Arizona; Oliver, "Plat of Township 18 North, Range 1 West, Gila and Salt River Meridian, Arizona," approved by the surveyor general April 27, 1910, U.S. Bureau of Land Management, Phoenix, Arizona.

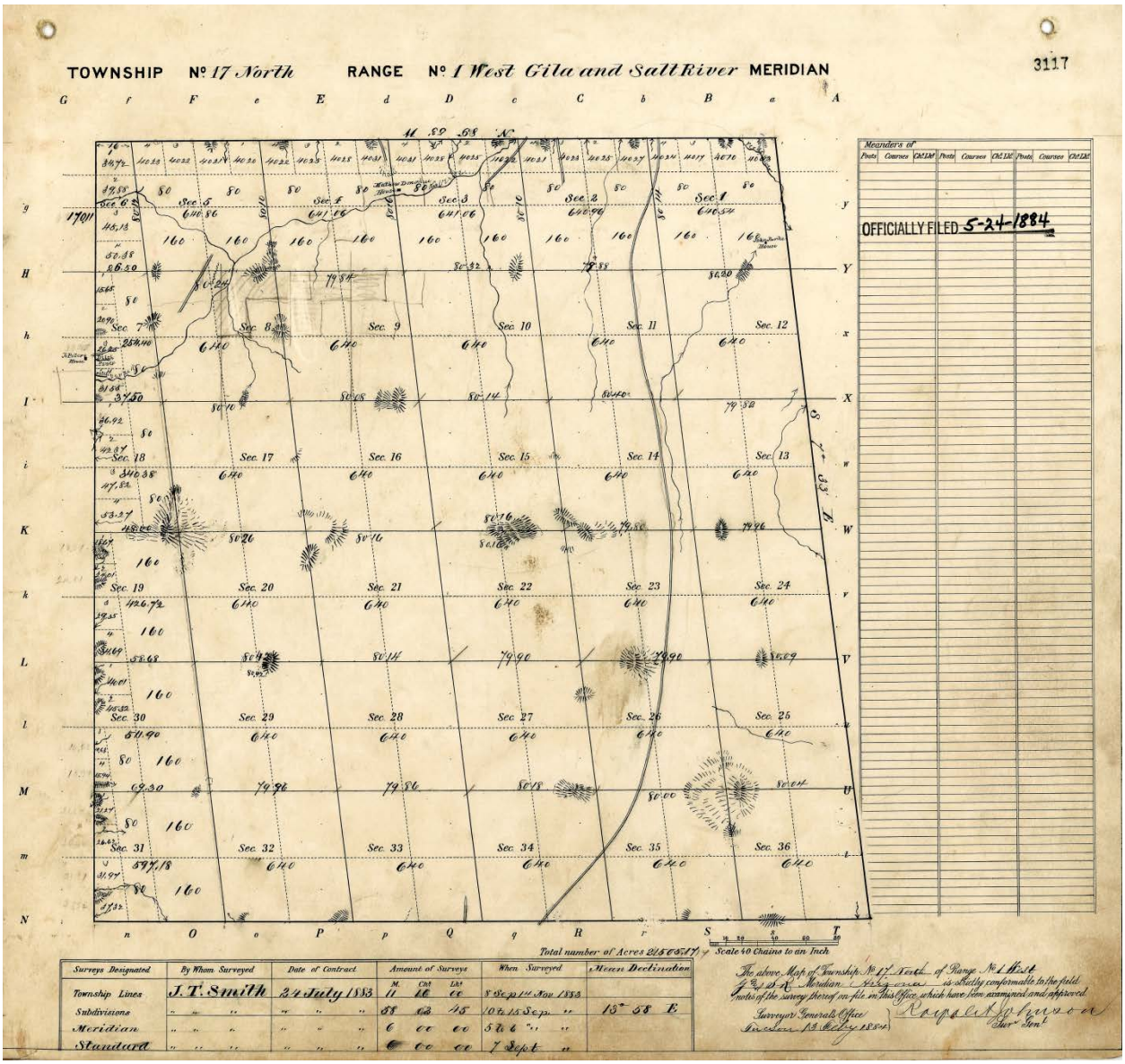

Figure 9: Survey plat of township 17 north, range 1 west, by J.T. Smith; approved by the surveyor general in 1884. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

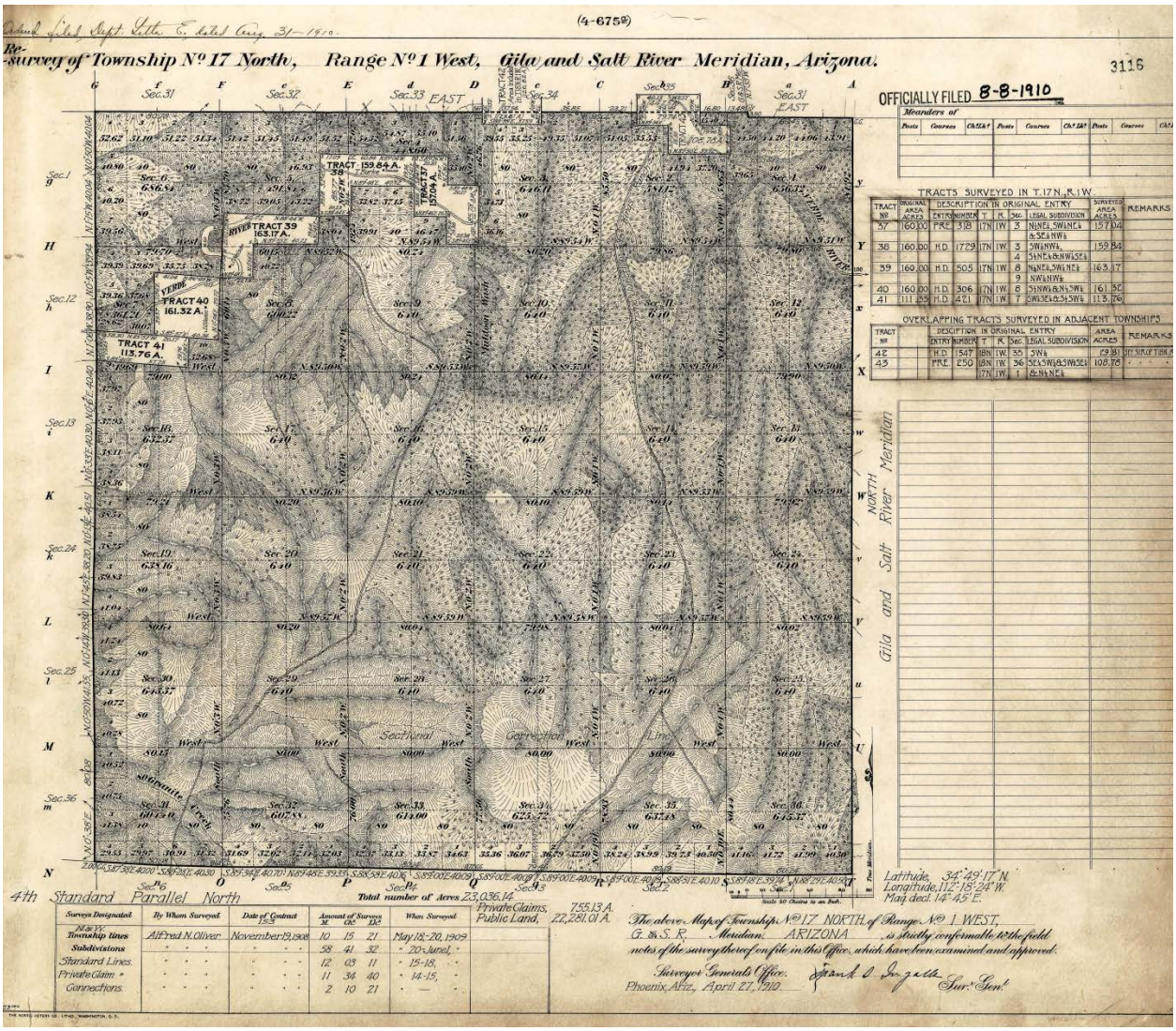

Figure 10: Resurvey plat of township 17 north, range 1 west, by Alfred N. Oliver; approved by the surveyor general in 1910. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

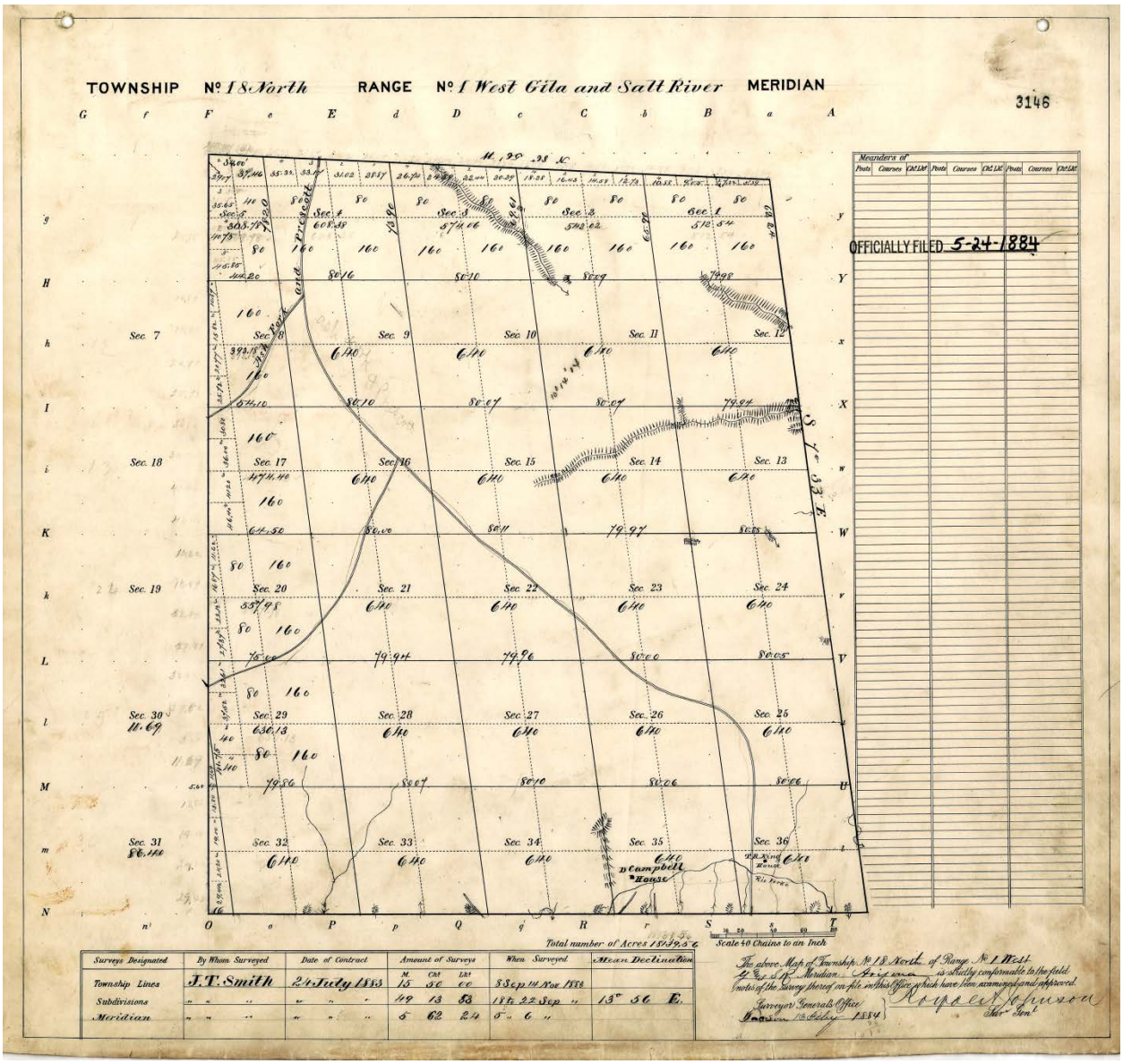

Figure 11: Survey plat of township 18 north, range 1 west, by J.T. Smith; approved by the surveyor general in 1884. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

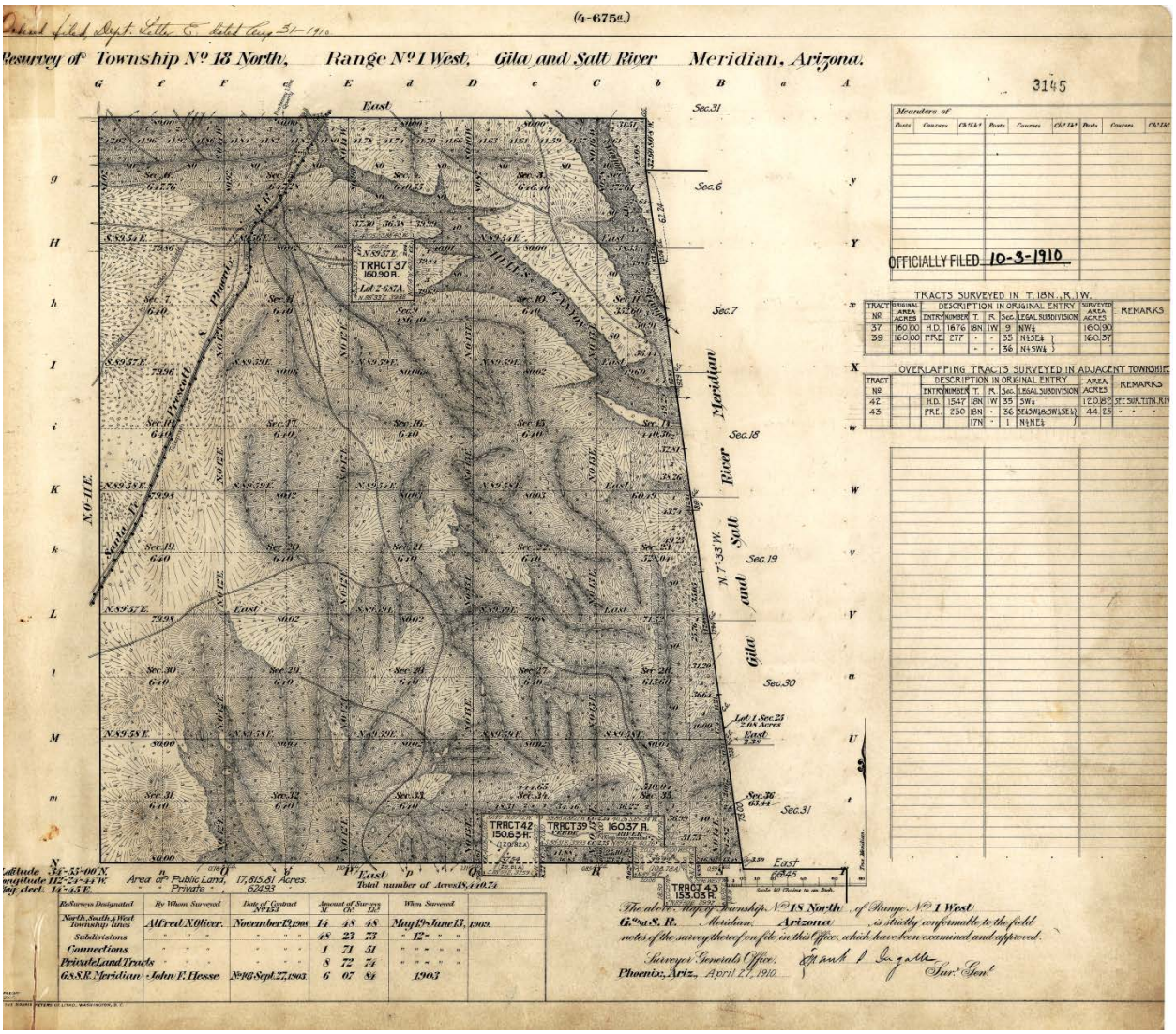

Figure 12: Resurvey plat of township 17 north, range 1 west, by Alfred N. Oliver; approved by the surveyor general in 1910. Source: U.S. Bureau of Land Management, Phoenix, Arizona.

D. Conclusion to Chapter 1

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 streams. As part of the U.S. Government's surveying efforts, the areas along parts of the Verde River were surveyed and resurveyed many times in the years before

1912. Significantly, while those surveys were done at varying times of year, in different years, and by at least eight individuals, all of the descriptions and plats that resulted from this work consistently portrayed the Verde River as a non-navigable stream.

CHAPTER 2: LAND PATENTS AND STATE GRANTS

The U.S. Congress passed a variety of homestead laws in the mid-to-late nineteenth century designed to facilitate the settlement of lands in the West that had been acquired from Mexico at the end of the Mexican War in 1848. The statutes resulted in thousands of federal patents being issued to settlers determined to establish homes and farms in the West's unfamiliar climate. This chapter, therefore, discusses how the patenting process sheds light on the topic of the Verde River's navigability before or at the time of Arizona's statehood in 1912. Yet before discussing federal land patents a few words need to be said about the Verde River's location as portrayed on various maps because this has bearing on related patent positions.

A. Historical Maps of the Verde River Region

The U.S. Geological Survey began mapping some of the areas surrounding the Verde River prior to Arizona's admission to the Union in 1912. These were not the first maps to be made of the region, however. As noted in Chapter 1, the U.S. General Land Office had conducted original surveys along the Verde beginning in the 1870s to facilitate homesteading and to create accurate legal descriptions of property. Subsequent mapping by the U.S. Geological Survey for the Verde River area began in the early 1900s resulting in numerous topographic maps.

In comparing the original U.S. General Land Office survey plats and the early U.S. Geological Survey topographic maps, it is clear that in some locations the Verde River changed channel significantly. Because of these shifts in the Verde River's position, homestead patents discussed below have been placed on seven exhibit maps showing the stream's position as of the date of the original surveys and also at the time the earliest U.S. Geological Survey topographic maps were drawn. The locations of the patents were determined by consulting the U.S. Bureau of Land Management's Master Title Plats. All of this material was then digitized and combined by

Salt River Project Cartographics using a GIS computer system. Six of the exhibit maps illustrate federal land patent locations along the Verde and a seventh exhibit map shows state patents. In addition, U.S. Forest Service maps have been consulted to help reconstruct the location of the Verde River as close to the time of statehood as possible. The seven exhibit maps appear below and can be consulted in relation to the discussion of land patents that follows. In addition, in digital form, these exhibit maps can be enlarged for closer scrutiny.

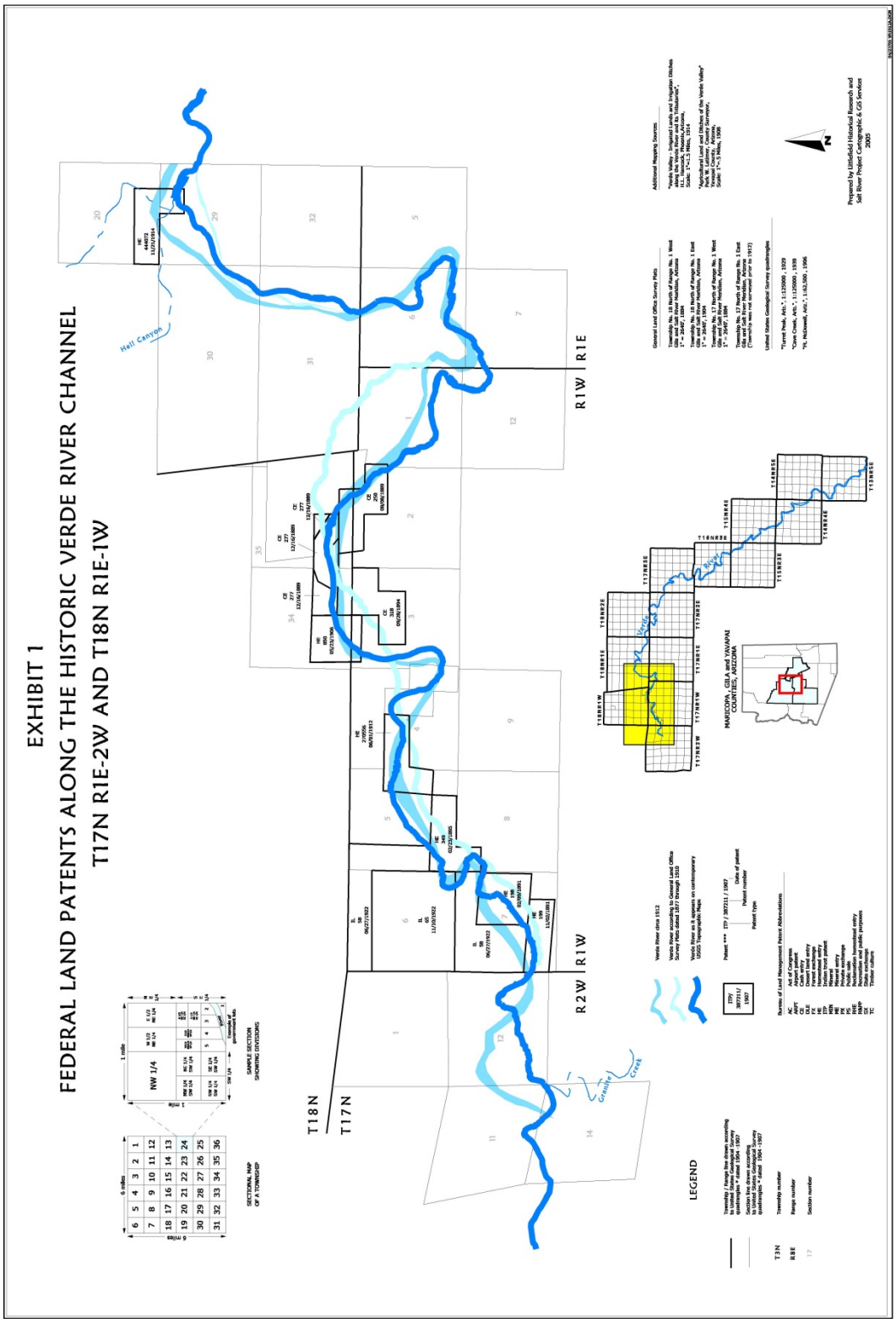

Figure 13: Exhibit 1, Federal Land Patents along the Historic Verde River Channel, T17N, R1E-1W, and T18N, R1E-1W. Source: Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005.

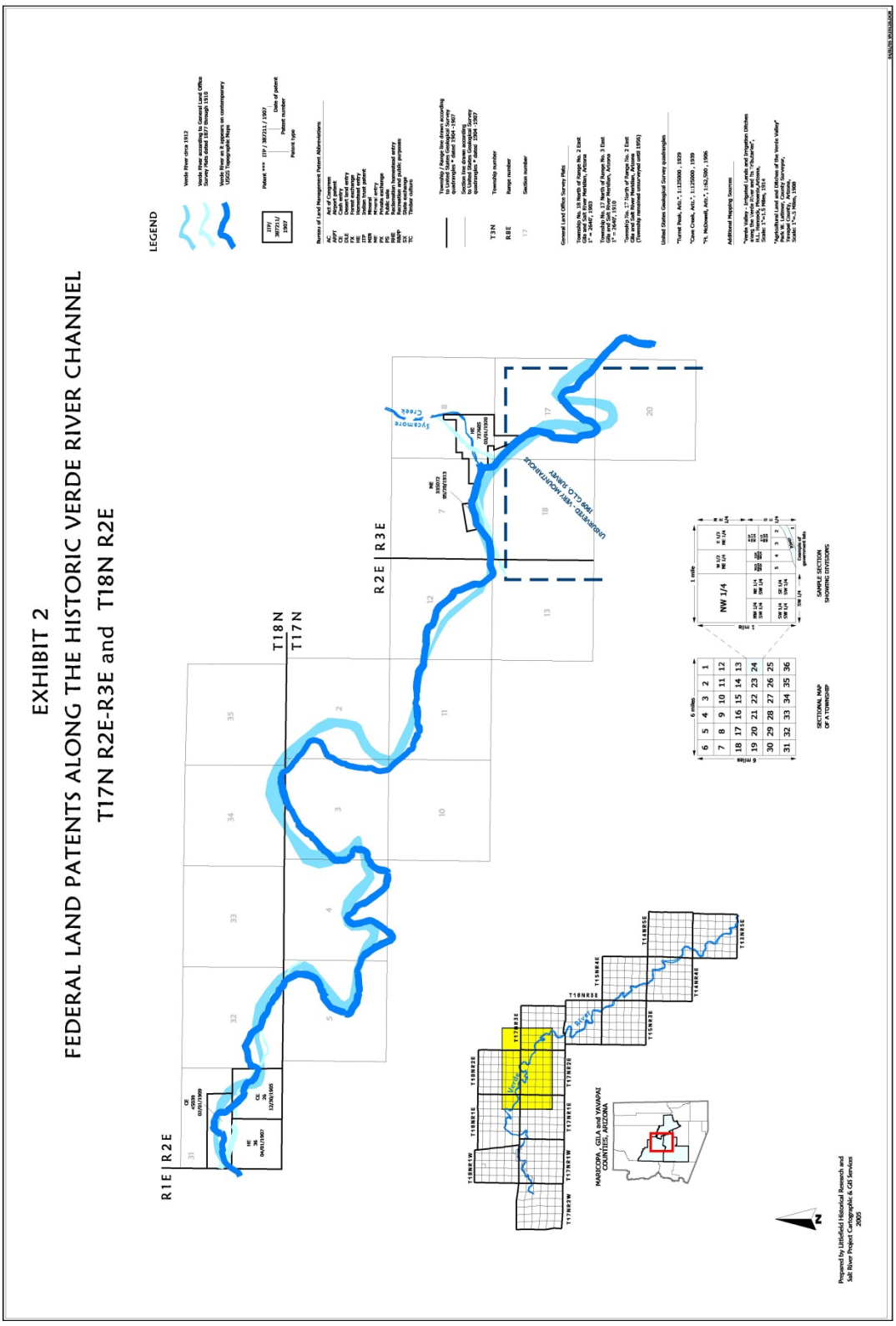

Figure 14: Exhibit 2, Federal Land Patents along the Historic Verde River Channel, T17N, R2E-R3E, and T18N, R2E. Source: Littlefield Historical Research and Salt River Project Cartographic & GIS Services 2005.

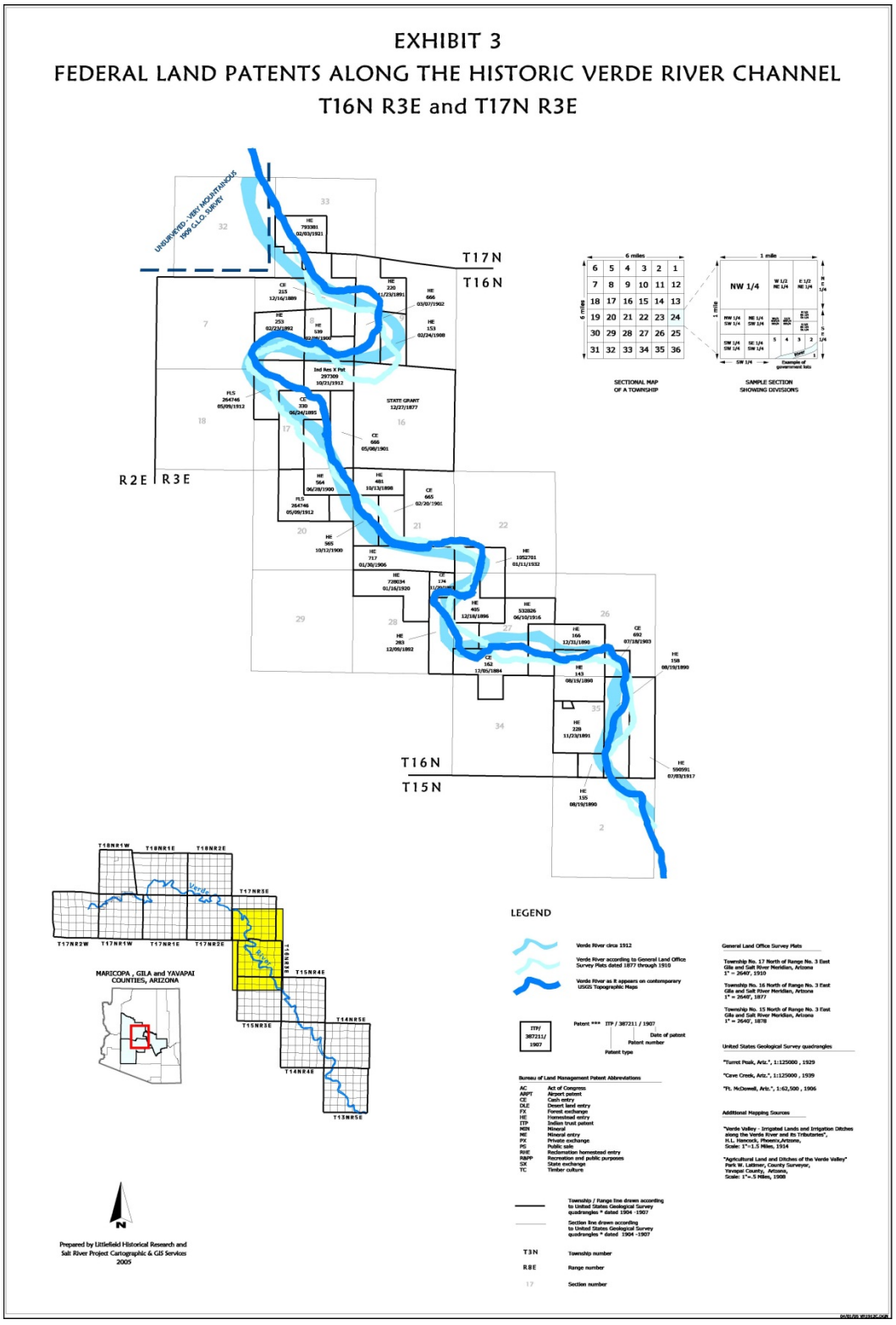

Figure 15: Exhibit 3, Federal Land Patents along the Historic Verde River Channel, T16N, R3E, and T17N, R3E. Source: Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005.

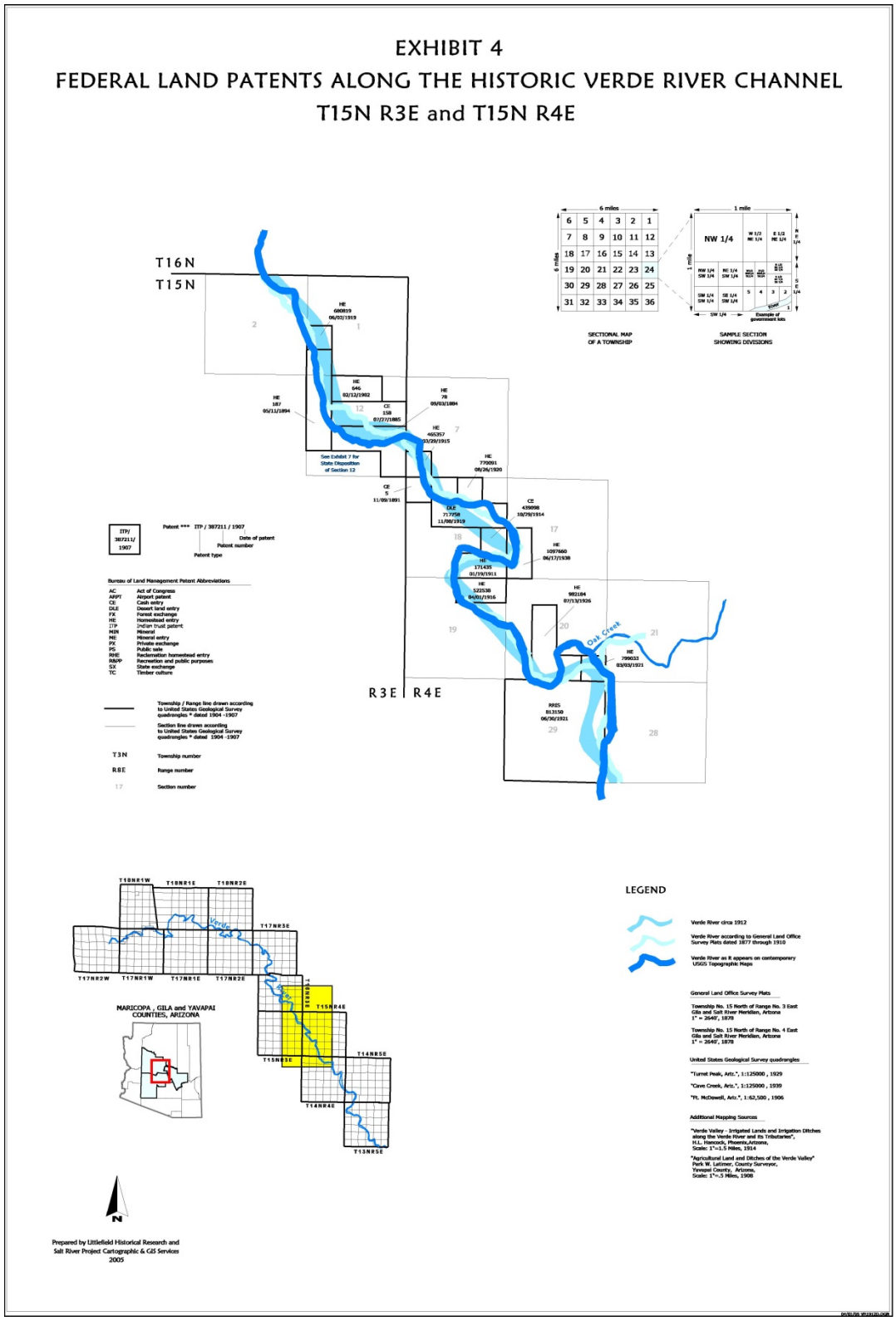

Figure 16: Exhibit 4, Federal Land Patents along the Historic Verde River Channel, T15N, R3E, and T15N, R4E. Source: Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005.

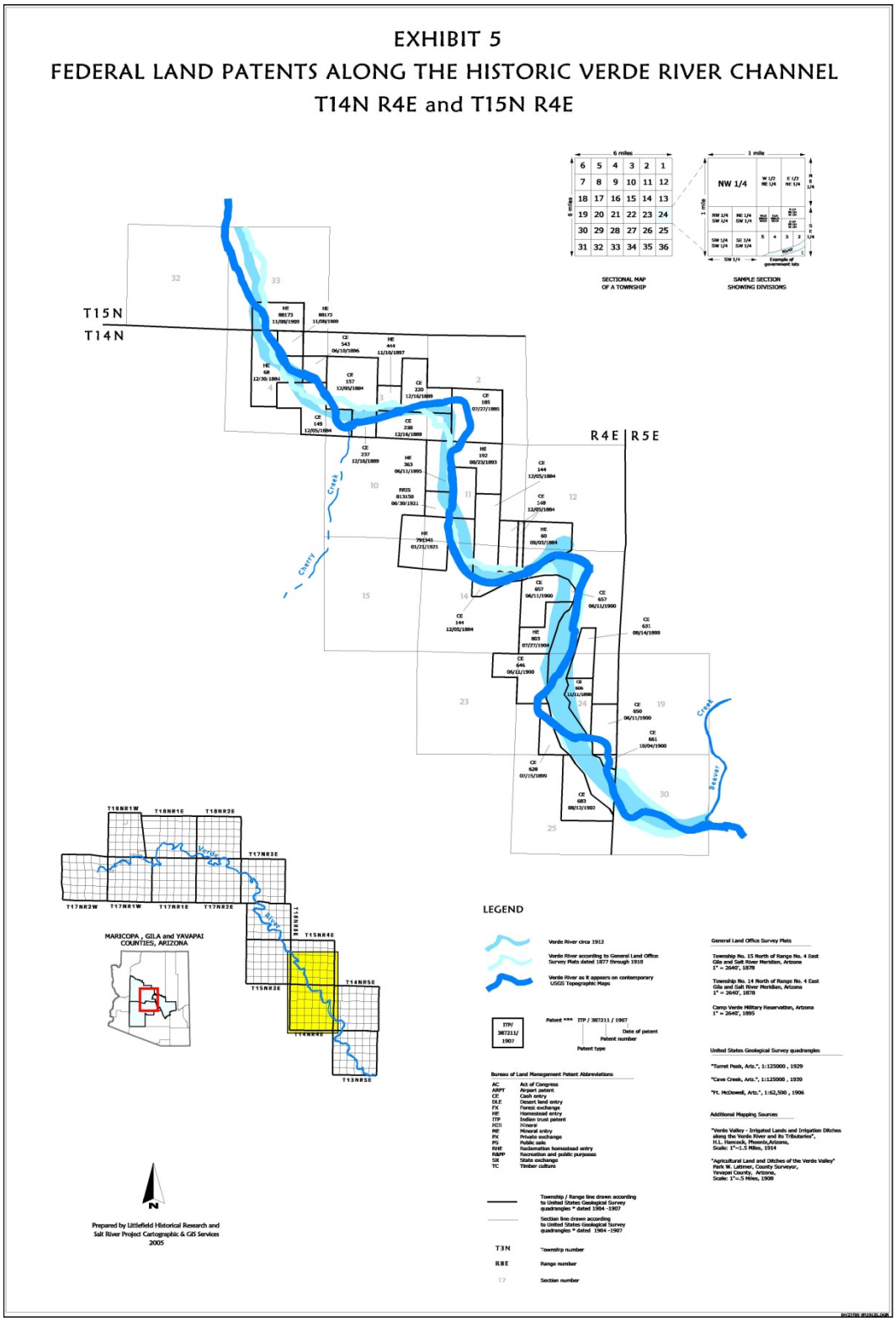

Figure 17: Exhibit 5, Federal Land Patents along the Historic Verde River Channel, T14N, R4E, and T15N, R4E. Source: Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005.

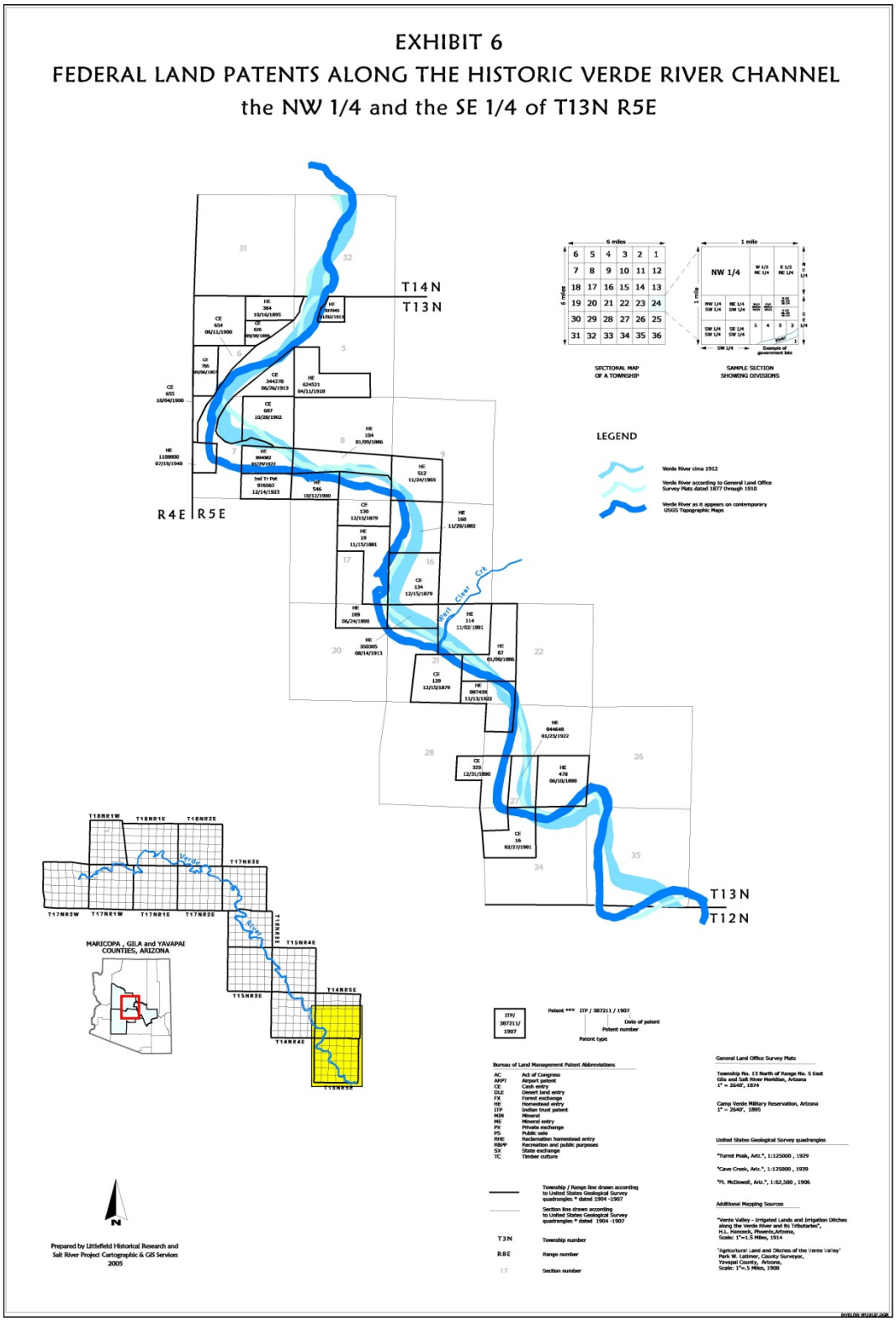

Figure 18: Exhibit 6, Federal Land Patents along the Historic Verde River Channel, NW 1/4 and SE 1/4 of T13N, R5E. Source: Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005.

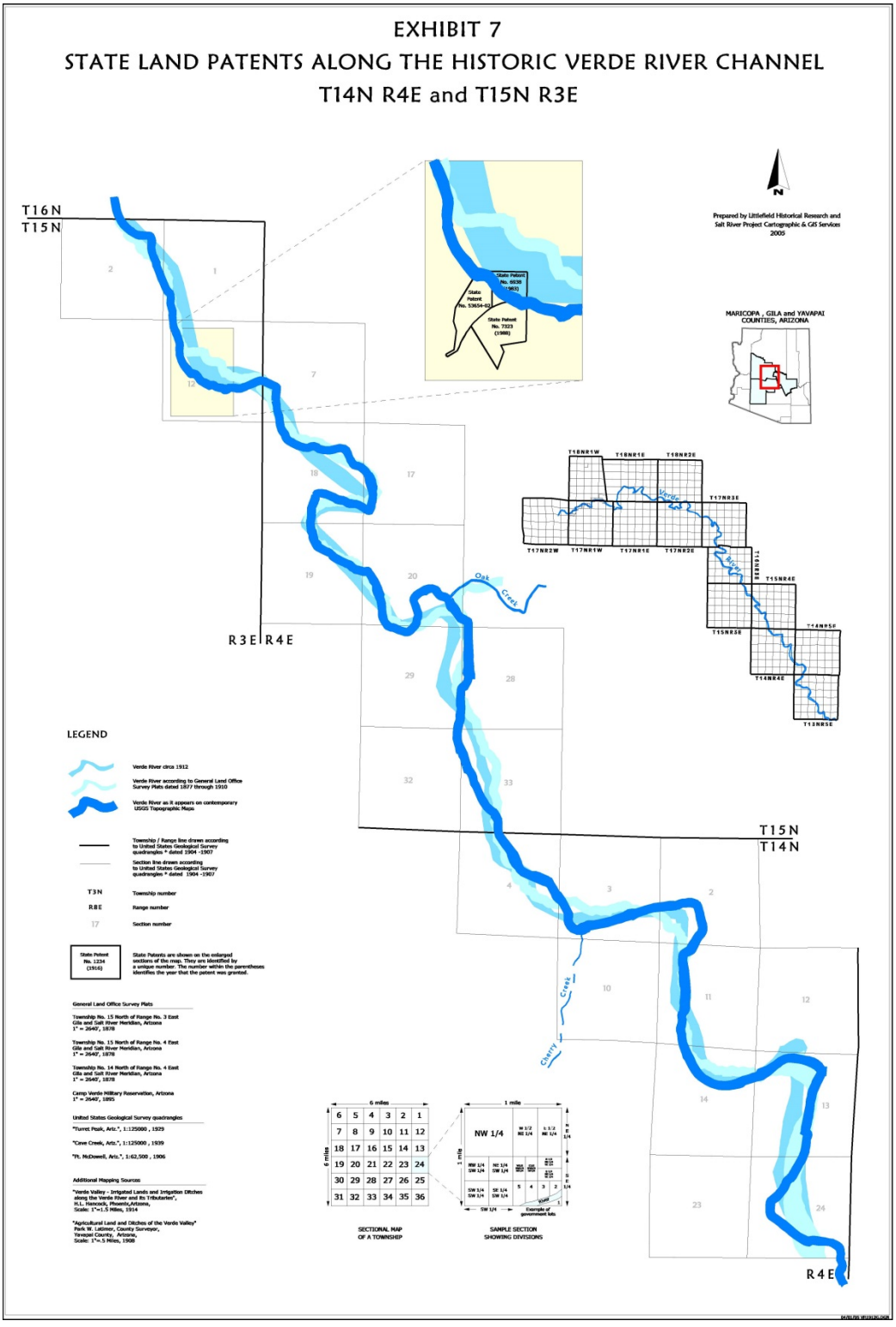

Figure 19: Exhibit 7, State Land Patents along the Historic Verde River Channel, T14N, R4E, and T15N, R3E. Source: Littlefield Historical Research and Salt River Project Cartographic & GIS Services, 2005.

B. Background on Homesteading and 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 Congress in the late nineteenth century generally required a settler to file an application and make a small payment for a given tract 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 7, township 17 north, range 2 east, 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, and so on.

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. The settler also would complete any remaining paperwork. 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 Verde River have been used in the preparation of this report.

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,

[48] The most important of these laws was *An Act of Secure Homesteads to Actual Settlers on the Public Domain*, 37 Cong., 2 sess., ch. 75 (1862).

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. If the land office approved the affidavits, the settler would pay an additional small fee, and he or she would be rewarded with the patent (legal title) to his parcel.

In relation to the Verde River, there many patent applications that were filed for parcels in sections overlapping the stream between the western boundary of township 17 north, range 2 west and the southern boundary of township 13 north, range 5 east. The lands lying between township 13 north, range 5 east, southward to the Verde's confluence with the Salt River were withdrawn from the public domain for various reasons such as U.S. Reclamation Service projects, national forests, and Indian reservations. Those townships, therefore, do not have any patents recorded.

1. Significance of Patents to Verde River's Navigability or Non-navigability

Federal patents to private parties and the supporting files are important for several reasons in ascertaining the potential navigability or non-navigability of the Verde River before or at the time of statehood. First, the patents indicate the total amount of land awarded by the United States. The acreage is significant because if the Verde River flowed through the parcel and had been considered navigable, federal officials would not have granted the title of the bed of the stream to private parties since Arizona would have owned it due to state 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). 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. In other words, a

patent to a small parcel of land lying next to a navigable body of water would have a reference to, hypothetically, "government lot 3, consisting of 27.4 acres."[49]

Importantly, none of the federal patents that overlay the Verde 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.) While there are some government lots lying next to meandered portions of the Verde, 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 1 above).

Another reason why patents are important to help determine whether the Verde 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 Verde River or whether he used the river for other purposes. Again, nothing in the supporting files suggests that the Verde River was navigable or that settlers used the stream for conveying commerce.

[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.

C. Federal Patents to Private Parties along the Verde River

This report discusses representative federal patents along the Verde River between township 13 north, range 5 east, upstream to township 17 north, range 2 west. While this does not include every township or every patent within this area to keep the discussion to manageable proportions, *all* patents in all townships for the area have, in fact, been reviewed. None contradicts the evidence presented here. Much of the land through which the Verde River flows below township 13 north, range 5 east, was withdrawn for various public purposes or was too rugged for settlement. Because no patents were granted there, therefore those townships are not discussed. All of the Verde River patents considered here are displayed on the six federal map exhibits above. In the analysis presented here, representative patents and their files will be reviewed going upstream.

1. Federal Patents in Township 13 North, Range 5 East

This township was one of the earliest areas settled along the Verde River. Although it is not part of the present-day incorporated limits of the town of Camp Verde, the region lies just south of it, and therefore has a history similar in nature. The residents of this part of the Verde Valley used the Camp Verde Post Office, and frequently referred to the army base as their home. The land in the area was quite fertile and therefore attracted many early homesteaders.

One such person was Joseph H. Morrison. On January 21, 1913, Morrison made a homestead entry application for land lying in and around the Verde River in section 27 of township 13 north, range 5 east. Morrison, however, failed to make his final proof on the land before it was withdrawn for the Coconino National Forest and also for the proposed Camp Verde Reservoir site. In 1918, Morrison applied for reinstatement of his entry. In an October 16, 1920, letter to the Secretary of the Interior regarding this parcel, Arthur Powell Davis of the Reclamation Service

quoted the president of the Paradise Verde Irrigation District, who observed that part of Morrison's patent lay in the Verde River itself:

> All but two acres of the claim lies below the water line of the proposed Camp Verde Reservoir. About sixteen acres are in cultivation and fifteen acres more capable of irrigation but now unimproved. *The remainder is rough and stony or lies in the river bed*. [Emphasis added.]

On Morrison's subsequent "Application for Reduction of the Required Area of Cultivation," he wrote:

> [t]he north ten acres is a high mesa about 150 feet above the rest of the land – the balance a fairly leval [*sic*] piece of land except – *a part comprising over twenty acres is river bottom***.** Neither the twenty acres in river and 10 acres on mesa can be farmed. [Emphasis added.]

Additionally, a survey plat of the tract completed by C.G. Ricketson in 1920 shows the river clearly as a part of the land in question. Despite all this information explicitly stating that the application included the river bed, the federal government eventually granted patent 844648 to Morrison without withholding the bed and the banks of the river due to the sovereign rights of Arizona.[50]

Long before Morrison came to the valley, settlement had started in this township with the arrival of Frank Jordan, who received his homestead entry patent in 1886. His land, located in section 8, also had the Verde River running directly through it. No land was withheld from Jordan's parcel due to the sovereign rights of the future state of Arizona to the bed and banks of the Verde River. He was granted 144.38 acres in the form of patent 134 in 1886. The acreage for this patent is somewhat less than a full quarter section of 160 acres because the Verde River was meandered

[50] Homestead Entry Patent File 844648, 1913, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 844648, 1922, U.S. Bureau of Land Management, Phoenix, Arizona.

during a resurvey of the township in 1892-1893. The meanders, however, were not done due to the stream's navigability. (This is discussed later in this chapter.)[51]

2. Federal Patents in Township 14 North, Range 4 East

In sections 2 and 3 of township 14 north, range 4 east was a tract sought by Robert M. Rogers. He received cash entry patent 238 for it on December 16, 1889. Though it is clear from historical maps that the Verde River ran directly through this land, none of this parcel was reserved due to Arizona's future sovereign ownership of the bed and the banks of navigable streams.[52] Similarly, no land was withheld from cash entry patent 149, lying upstream in section four. Instead, this 160 acre parcel of land was patented to Josiah Marr on December 5, 1884. Despite the river's obvious presence in the tract, there is no evidence that any acreage was withheld from the patent for Arizona.[53]

In addition to the patents discussed here, there are numerous other patents and related files in this township that all have similar characteristics. In each case, while the Verde River ran through these parcels, no land was withheld from patenting due to the presence of the stream.

3. Federal Patents in Township 15 North, Range 4 East

Other examples of patents being issued for lands through which the Verde River flowed can be found in township 15 north, range 4 east. For instance, homestead entry patent 88173 was granted to Samuel G. Wallingford in 1909. The land lying in the western portion of this parcel in section 33 clearly was in the bed of the Verde River. Nonetheless, Wallingford was granted a

[51] Homestead Entry Patent 134, 1886, U.S. Bureau of Land Management, Phoenix, Arizona.
[52] Cash Entry Patent 239, 1889, U.S. Bureau of Land Management, Phoenix, Arizona.
[53] Cash Entry Patent 149, 1884, U.S. Bureau of Land Management, Phoenix, Arizona.

patent for the entire acreage, which included adjacent land in the patent in section 4. No land was withheld for the future sovereign rights of Arizona.[54]

Upstream from Wallingford, Louis Tiszo made a homestead entry on June 15, 1903, for land lying in section 18 in this same township. According to maps showing the Verde around the time of statehood, the river flowed through Tiszo's entire parcel of land. On his final proof, located in his patent file, Tiszo wrote that he was "[a]bsent two months in each year, both self and family, on account of high water principally . . . absent in December and January annually." One of Tiszo's witnesses wrote that the family was absent during those months because the "children could not cross river during rainy season [to attend school]." Not only was the Verde River clearly located on the land, but the ability of the children to cross the stream during drier months strongly suggests its non-navigability. Furthermore, no land was withheld from the patent on behalf of Arizona's sovereign right to ownership of the bed and banks of navigable streams. Tiszo was granted the full eighty acres in 1911.[55]

There are other patented parcels through which the Verde River flowed in this township that further confirm the non-navigability of the stream. 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, those *Desert Land Act* patents are discussed later in this chapter.

4. Federal Patents in Township 15 North, Range 3 East

Like the other townships surrounding it, this township contains many original patents that demonstrate the non-navigability of the Verde River before or at 1912. In section 12, a homestead application was made by James W. Anderson for land lying mostly in the southeast quarter of the

[54] Homestead Entry Patent 88173, 1909, U.S. Bureau of Land Management, Phoenix, Arizona.

[55] Homestead Entry Patent File 171435, 1903, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 171435, 1911, U.S. Bureau of Land Management, Phoenix, Arizona.

section. It is clear from historical mapping sources that the Verde River ran through this parcel of land. Nonetheless, on September 3, 1884, Anderson received patent 78 for a total of 160 acres. There is no indication that the federal government reserved any of the bed and banks of the river for Arizona. Although this land eventually reverted back to the federal government and then was transferred to Arizona, there is no indication that the state claimed the land under its sovereign rights to the beds and banks of navigable streams. Instead, the state received this land as part of the federal grant to Arizona of all sections 2, 16, 32, and 36 within the state. (See later in this chapter for full discussion of state grants.)

North of Anderson's land was a parcel filed for by Caroline E. Adams. These lands lay in a portion of the southwest quarter of section 1, and the Verde River ran through the tract. Adams wrote to the Commissioner of the General Land Office substantiating this fact. In this 1915 letter, Adams observed that the forty acres upon which she had filed her claim were "cut up considerable by the river and washes and a part of it is a rocky hill." Despite the fact that the some of the land lay in the Verde's bed, the U.S. granted homestead entry patent 680819 to Adams in 1919, reserving no land for Arizona.[56]

5. Federal Patents in Township 16 North, Range 3 East

Continuing upstream, there are more examples of patents which indicate the Verde River's non-navigability. Forest in-lieu selection 264746 lay in sections 17 and 20 of township 16 north, range 3 east, both of which had the Verde River running through them. This parcel had been chosen in 1911 by the Santa Fe Pacific Railroad as an in-lieu selection for railroad grant lands relinquished elsewhere in Arizona (in this case, for the San Francisco Mountains Forest Reserve). Prior to

[56] Homestead Entry Patent File 680819, 1915, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 680819, 1919, U.S. Bureau of Land Management, Phoenix, Arizona.

confirming title to the railroad, however, the United States had to determine whether the land had any hydroelectric power possibilities, and to that end the General Land Office sent Silas L. Gillan to inspect the property. Gillan reported that "approximately half of the land embraced within these subdivisions is gravelly river bottom and adjacent gravelly bench land." He added:

> *The N1/2 NW1/4 and SW1/4 NW1/4, Sec. 17 is crossed by the Verde River***.** I roughly estimated the flow of the Verde River on January 17, 1912, at 100 second ft. . . . Based upon a flow of 90 second ft., a figure which probably represents the minimum flow, a quantity sufficient for the generation of about 8 H.P. per ft. of available head, it will be seen that a comparatively high head will be necessary to secure any practicable power development. Reference to the U.S. Geological Survey topographical map [illegible], will show that between Sec. 17 and Packard's ranch, a distance of about nine miles, the fall is less than 200 ft. Above Packard's ranch, the flow in the Verde River is considerably less than 90 second feet, because at this point Sycamore Creek comes in. . . . The river bed in the northerly portion of Sec. 17 is sandy and gravelly and is not suitable for the foundation of a dam to hold the Verde River while in flood stages. [Emphasis added.]

Commenting on Gillan's findings, George Otis Smith, director of the U.S. Geological Survey, noted that the 90 second feet was "a limited supply of water," and continued that "the fall is hardly sufficient to warrant the development of power by the construction of a dam since there are apparently no suitable reservoir sites in the vicinity."[57]

Not only do the above documents indicate that the Verde River was not navigable, but so too does the fact that the United States patented the 240 acres of land to the Santa Fe Railroad Company in 1912. No land was reserved for Arizona in the bed and banks of the Verde due to that stream's possible navigability.

Also in section 17 of township 16 north, range 3 east, lay a parcel granted to Willie A. Jordan in 1895. The Verde River flowed directly through this land, and Jordan's patent file made this fact clear. James Jordan, one of Willie Jordan's witnesses (and probably a relative), stated that

[57] Forest Lieu Patent File 264746, 1911, Santa Fe Pacific Railroad Company, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Forest Lieu Patent 264746, Bureau of Land Management, Phoenix, Arizona.

"[the land] is on the Verde River and south or nearly south of the Fleet Ranch." Nonetheless, the federal government patented this 160-acre parcel on June 24, 1895, without reserving the bed and the banks of the river Arizona.[58]

6. Federal Patents in Township 17 North, Range 3 East

Going upstream on the Verde into township 17 north, range 3 east, settlement along the Verde River was sparse. Nevertheless, there are patents in this township that further demonstrate the Verde River's non-navigability. On June 11, 1914, for example, Timothy P. Sullivan applied for a homestead patent for land lying in section 33 of this township. The Verde River ran through the southwest corner of this parcel, and the patent file underscored this point. Because the tract lay within the boundaries of the Coconino National Forest, it was surveyed by that agency's staff. The field notes of the survey were checked and approved on August 30, 1912, by the Forest Supervisor. In those notes, surveyor Thomas E. McCullough noted that at 19.10 chains, he went:

> [a]cross the west edge of area plowed. Twelve chains from [a point I marked] H 4 is the east bank of the Verde River. Corner H 5 is in the running wash of this Verde River and can only be located by intersection or by plane table. . . . [At five chains I went] to the edge of the east bank of the Verde River, up over the bank and thru [sic] thicket of willow and locust. . . .

The plat accompanying the field notes clearly indicated that the Verde River ran directly through the tract. Sullivan's final proof also noted that "[a]ll [land] fenced *except small part river rund thru* [*sic*]." (Emphasis added.) Despite the fact that the river flowed directly across this land, Sullivan received homestead entry patent 793381 in 1921 without reservation of the bed and the banks of the Verde River for Arizona.[59]

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[58] Cash Entry Patent File 330, 1887, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Cash Entry Patent 330, 1895, U.S. Bureau of Land Management, Phoenix, Arizona.

[59] Homestead Entry Patent File 793381, 1914, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 793381, 1921, U.S. Bureau of Land Management, Phoenix, Arizona.

At the northern end of township 17 north, range 3 east, the Sycamore Mining, Smelting & Development Company filed a mining patent claim in section 7. Mineral survey 2868 of what was called the "Gold Tooth" claim was undertaken by J.J. Fisher on November 3 and 4, 1910, to determine the legal boundaries of the tract. His survey notes clearly showed that part of the border of the mineral claim had the Verde River flowing through it:

> Beginning at Cor. No. 1, the S.W. Cor. of the location, identical with same, a monument of stones 2.5 ft. base, 1.5 ft. high. This Cor. being located *in the channel of the Verde River*, a point unsuitable for the establishment of a permanent corner, I establish a W.C. hereafter described at N. 10 30' W. 98 ft. dist., thence from true corner point I ran N. 10 30' W. [Emphasis added.]

While the survey notes demonstrated that the Verde River flowed through the tract, they also indicated the stream to be forty feet wide and eighteen inches deep.

In approving the mineral claim on February 7, 1913, the Acting District Forester observed that "[t]he Verde river runs through the claim from west to east." And, suggesting the river was not used for transportation, he added that "Verde Valley railroad is on an average of 18' to 20' higher than the river along here." Yet despite the river's presence in the mineral claim, the U.S. patented the land in May 1913, reserving no land for Arizona.[60]

7. Federal Patents in Township 18 North, Range 1 East

Moving closer to the headwaters of the Verde River, Joseph Brazil filed a homestead claim on land lying in the Tusayan National Forest in sections 20 and 29. When plotted on historical maps of the region, it is clear that the river flowed through a large portion of section 29. On July 14, 1913, District Forester Paul E. Millar submitted a report recommending favorable action on the claim. In this report, Millar wrote:

[60] Mining Entry Patent File 335072, 1910, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Mining Entry Patent 335072, 1913, U.S. Bureau of Land Management, Phoenix, Arizona.

> Power possibilities exist as tract crosses Verde River which flows about 1,000 miner's inches of water. . . . The S1/2 SW1/4 embraces about forty acres of rocky woodland mesa some 300 feet above the Verde River and the remainder is the precipitous rocky slope of Hells Canyon, no ground suitable for agriculture. SW1/4 SE1/4 of Section 20 embraces the precipitous rocky walls, sandy flood plain and rocky bed of the MC Canyon, no agricultural land. NW1/4 NE1/4 Section 29 embraces mouths of Hells and MC Canyons *and rocky bed of Verde River*. [Emphasis added.]

At the end of the report, Millar wrote that the parcel "is held to maintain a watering place on the Verde River for the cattle owned by claimant." No land was reserved for Arizona due to the presence of the Verde River. Brazil was granted 160 acres in the form of homestead patent 444072 in 1914.[61]

8. Federal Patents in Township 17 North, Range 1 West

Continuing upstream, Farrall Tiernan made final proof for a cash entry patent on November 6, 1886, for land lying in section 3 of township 17 north, range 1 west. The Verde River flowed through this land. John Duke, one of Tiernan's witnesses, stated in his witness affidavit that "*the Verde river runs through it [the patent]*, it is mountainous." (Emphasis added.) Frank Krell, another witness for Tiernan, wrote that the "*Verde River runs through the center of it.* There is about fifteen acres of bottom land on the river and the rest is hilly land on both sides." (Emphasis added.) Even the claimant himself, when asked, "[d]oes your claim control or include any water supply?" answered that "[i]t does. The Upper Verde River." Nonetheless, the federal government patented the land without reserving the bed and the banks of the stream for Arizona. Tiernan received the full 160 acres of land on September 28, 1894.[62]

[61] Homestead Entry Patent File 444072, 1913, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Homestead Entry Patent 444072, 1914, U.S. Bureau of Land Management, Phoenix, Arizona.

[62] Cash Entry Patent File 318, 1886, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Cash Entry Patent 318, 1894, U.S. Bureau of Land Management, Phoenix, Arizona.

D. The *Desert Land Act* of 1877 and Navigability

In addition to patented lands already discussed, other parcels along the Verde River were claimed under the terms of the *Desert Land Act*. Passed by Congress on March 3, 1877, this law was intended to allow arid lands to be claimed in larger blocks than under other homestead acts since desert lands were less productive (from an agricultural perspective) than non-arid lands. The *Desert Land Act* allowed a settler to file an application for up to 640 acres. The relevance of the *Desert Land Act* to the question of the Verde River's navigability lies in the requirement that the desert land being claimed had to be irrigated before a final patent would be awarded. Importantly, the water used in that irrigation had to be taken from a non-navigable stream:

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

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[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 navigability or non-navigability of the Verde River. There were over fifty applications for land under the *Desert Land Act* in lands adjacent to the Verde River, many of which cited that stream as their source of water. All of the applications were initially accepted by the U.S. General Land Office in Phoenix. The logical conclusion from these applications is that the Verde River (as the source for reclamation of these lands) must have been considered non-navigable by the applicants as well as by the administrators of the U.S. General Land Office. Although many of the applications were subsequently canceled or relinquished due to failure to fulfill the *Desert Land Act*'s requirements, the mere fact that the applications were initially accepted indicates a contemporaneous belief that the Verde River was not navigable. There is no indication the cancellations and relinquishments were due to the navigability of the Verde River.

1. Desert Land Entries in Township 15 North, Range 4 East

At least two of the desert land entries not only cited the Verde River as the source of water, but they also had the stream running through them. On December 11, 1911, Dea Mee Get applied for a desert land entry patent for land in section 18 of township 15 north, range 4 east. The Verde River not only ran through a large portion of this claim, but Get also declared that he would reclaim his land with water from the Verde River. Land Agent A.A. Wilhelm wrote a favorable report on Get's application on a March 5, 1914, which subsequently was added to Get's patent file. Wilhelm stated that "the water right consists of an appropriation from the Verde River, which is said to be perennial and it is believed the water appropriated is sufficient to permanently reclaim the entry." Get's final proof stated:

> The Verde River runs beside the land or adjoining it. . . . The Verde River [is my source of water]. I can pump upon my land about 250 gals per minute. I acquired water right under the State law on waters.

This patent file is important in many respects. First, the fact that the U.S. patented this land despite the fact that the Verde River ran through it suggests that the federal government did not believe the stream to be navigable. No acreage was removed for the sovereign rights of Arizona to the bed and the banks. Second, the claimant declared the Verde River as the source of water, and the *Desert Land Act* required that water to be from a *non-navigable stream*. On October 29, 1914, Get was granted patent 439098 for forty full acres.[65]

Just north of Get's land lay another parcel of prime land also in section 18 of township 15 north, range 4 east. On February 11, 1914, Ada D. Andrews filed a desert land application for this parcel through which the Verde River flowed. On the application, Andrews stated that the land:

> borders on the Verde River and *that there is through or upon said land Verde River*; that said land is not naturally irrigated or watered, nor overflowed at any season of the year by the foregoing or any other natural stream, spring, or other body of water; that I expect to obtain my water supply to irrigate said land from Verde River by pumping and canals and ditches. [Emphasis added.]

Almost four years later, Andrews stated on the final proof that "Verde River passes through land," and witnesses concurred. In January, 1919, the U.S. General Land Office investigated the application, and a special agent submitted a report recommending that the patent be issued. In the report, the agent wrote that:

> *[t]he Verde River passes through said described lands.* The 13-acre tract is on the south side of the river. . . . [The main ditch] has been constructed to irrigate all the irrigable land south of the river. The ditch in question has never been used, but Andrews advised me that he intended to remove his engine and pump and irrigate all irrigable land in the approximately three forties on the south side of the river. [Emphasis added.]

Despite the obvious fact that the Verde River flowed through this claim, the U.S. nonetheless patented the land to Andrews without reserving the bed and the banks for Arizona.

[65] Desert Land Entry Patent File 439098, 1911, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Desert Land Patent 439098, 1914, U.S. Bureau of Land Management, Phoenix, Arizona.

Even more telling, however, was the fact that the Verde River was stated to be the source of water to reclaim this tract – a statement that only would have been possible had the stream been considered non-navigable.[66]

The history of *Desert Land Act* entries along the Verde Rive supports the evidence from homestead and cash entry patents that the Verde River was not considered navigable by contemporaneous observers. No mention was made in the *Desert Land Act* applications of reserving the bed and the banks of the Verde River for Arizona due to the sovereign rights of the state for those parcels overlying the river. Moreover, the fact that over fifty desert land entries cited the stream as a source of water indicates that many individuals thought the stream not to be navigable. In fact, the evidence indicates that all contemporaneous observers considered the Verde to be non-navigable.

E. Federal Land Grants to Arizona

Arizona, like other public domain states, obtained land by Congressional grants to support certain public interest objectives prior to and following statehood. Historically, such grants to new states had started with Ohio's admission to the Union in 1802, although over the years the types and sizes of the grants varied from state to state. Grants to Arizona covered a variety of purposes. For example, prior to statehood, Congress reserved for Arizona all sections 16 and 36 for the purpose of supporting public schools. At statehood, sections 2 and 32 were added (also for schools), with all four sections totaling 8,093,156 acres throughout the state. In addition to this land, 1,446,000 more acres were given to Arizona instead of the internal improvement, swamp, saline, and agricultural

[66] Desert Land Entry Patent File 717758, 1914, Serial Land Patents, Records of the U.S. General Land Office, Record Group 49, U.S. National Archives, Washington, D.C.; Desert Land Patent 717758, 1919, U.S. Bureau of Land Management, Phoenix, Arizona.

college grants provided to earlier states. Moreover, an additional one million acres were granted to Arizona to pay for bonds issued by certain counties.

Aside from sovereign lands (which were determined by navigability and not by an act of Congress) and lands in sections 2, 16, 32, and 36, Arizona was allowed considerable leeway in selecting the other federally-granted lands. In addition, Arizona had flexibility in selecting "in-lieu" or indemnity acreage if mineral lands (which were denied to the state), 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 Verde River's bed in sections 2, 16, 32, and 36 or in other federal lands granted to the state where they overlay the Verde.

There are several places along the Verde River where sections 2, 16, 32, or 36 have the stream running through them. One example is in township 16 north, range 3 east, which has the Verde flowing through the northwestern corner of section 16. Arizona could have selected "in-lieu" lands to replace those covered by the Verde due to a "double" claim, if in fact the river had been considered navigable. No such lands were selected, however, thus demonstrating that in relation to this section state officials did not consider the stream to be navigable. Comparable circumstances apply to the other sections 2, 16, 32, or 36 through which the Verde River flowed.

F. State Disposition of Federally-Granted Lands

In the years following statehood in 1912, Arizona's officials confronted the daunting task of disposing of millions of acres given to the state by Congress for various purposes. To do this, the Arizona State Legislature created an initial version of what became the Public Land Code in a special 1915 session. This code laid out the manner in which the state would dispose of its public

land. The basic procedure 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 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 will demonstrate that Arizona officials did not consider the Verde River to be navigable when granting title to parcels through which the stream flowed to private parties. The discussion centers around the land in section 12, township 15 north, range 3 east, which is the only area where Arizona granted patents to lands through which the Verde ran. (For the location of state patents discussed here, see Exhibit 7, which is reproduced earlier in this chapter.) Information about state patents is derived from the state patents themselves and related state patent files at the Arizona State Land Department.

1. State Patents in Township 15 North, Range 3 East

It is unclear why the state of Arizona obtained the lands located in the southwest quarter of section 12 of township 15 north, range 3 east, since that land was originally patented by the federal government to James W. Anderson. However, it *is* clear that once the state received the lands, it subsequently sold them to private parties. The three state patents which touch the Verde River in section 12 (numbers 53654, 6938, and 7323) were all sold to the Verde Valley Manor Retirement Center at various dates during the 1980s. There is no indication that the state attempted to retain any portion of the lands due to their location in the bed of the Verde River.

G. Conclusions to Chapter 2

In conclusion, the federal government granted over one hundred separate patents that touched or overlay the Verde 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 Verde River by Arizona. In each case, several parties expressed implicit opinions on the navigability of the Verde 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 Verde River's navigability in this manner – opinions spread chronologically in 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 Verde River ran provided another perspective. If the state's officials had believed the state owned the bed and banks of the river, they would have considered the stream's navigability in disposing of those lands. Collectively, therefore, federal patents, Congressional grants to Arizona, and state patents strongly indicate that federal as well as state officials did not perceive the Verde River to be navigable.

CHAPTER 3: GOVERNMENT REPORTS AND DOCUMENTS

Although U.S. Government survey records and documents relating to federal and state patents are crucial to understanding perceptions of the Verde River prior to and in 1912, other U.S. government records – both published and unpublished – provide a wealth of supplemental information concerning that stream. Two of the most important federal agencies concerned with the region were the U.S. Geological Survey and the U.S. Reclamation Service (today, the Bureau of Reclamation). Both 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 Verde River before and at the time of Arizona statehood.

In addition to the Geological Survey and the Reclamation Service, another federal agency whose records reveal the nature of the Verde River is the U.S. Indian Service (now, the Bureau of Indian Affairs). This agency was responsible for the Salt River Indian Reservation and the Camp McDowell Indian Reservation (later incorporated into the Salt River Indian Reservation). The Verde River flowed through both of these reservations, and thus there is a considerable body of documentation concerning the river and its impact on Indian life available in Indian Service records.

Because of the importance of the records of the Geological Survey, the Reclamation Service, and the Indian Service, the documents they created will be discussed in detail in this chapter. There were, however, other federal agencies whose responsibilities brought them into contact with the Verde River. For example, the files of the secretary of the interior (the "parent" to the Geological Survey, Reclamation Service, and Indian Service) also contain descriptions of the Verde River. Although secretary of the interior's records were thoroughly reviewed for this report, the characterizations of the Verde River in those documents essentially duplicate those of the

Geological Survey, the Reclamation Service, and the Indian Service. Therefore, to avoid needless repetition, only the latter three agencies' papers will be reviewed here. That discussion will cover representative examples of thousands of pages of documents all substantiating that the Verde River was never viewed as a reliable means of commercial navigation by federal authorities.

A. Records of the U.S. Geological Survey

The U.S. Geological Survey and its predecessor agencies had started recording commentary concerning the West's water resources as early as the 1870s. These documents carry considerable detail about the Verde River prior to and at the time of Arizona's statehood in 1912.

1. The 1872 Wheeler Survey

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 which 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 which contained a daily record of the journey as well as descriptions of various subjects. In the report, Wheeler mentioned several streams in Arizona, including the Verde, Gila, and the Salt. Yet Wheeler did not describe any of these rivers as being navigable, although navigability was a characteristic Wheeler would have commented on given his discussion of the Colorado River. Under a section entitled "Means of Communication," Wheeler noted that navigation on the Colorado had taken place upriver as high as Camp Mohave. Yet Wheeler was pessimistic about reliable river transport anywhere in the West, even including even on the Colorado River:

> 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.[67]

2. U.S. Geological Survey Annual Reports

Following the Wheeler Survey, the U.S. Geological Survey became more directly involved in examining water resources in the West. In 1888, the Geological Survey'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.

The yearly reports drafted by the Geological Survey contain detailed information on many streams in the West, including the Verde River. For example, part II of the *Eleventh Annual Report of the United States Geological Survey to the Secretary of the Interior, 1889-1890* included a section devoted solely to streams in the entire Gila Basin, which includes the Verde. John Wesley Powell, who wrote the report, noted the characteristics of the Gila and its tributaries:

> 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 [of the Gila Basin] show conditions almost the reverse, being at that season at their very lowest stages – even dry – and rising in sudden floods at the beginning of and during the winter. These floods are of the most destructive and violent character; the rate at which the water rises and increases in amount is astonishingly rapid, although the volume is not always very great. . . . From this it will be recognized that the onset of such a flood is terrific. Coming without warning, it catches up logs and bowlders [*sic*] in the bed, undermines the banks,

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

> and, tearing out trees and cutting sand-bars, is loaded with this mass of sand, gravel, and driftwood – most formidable weapons for destruction.[68]

Powell made no exception to this description, and thus the characterization of the basin as a whole presumably applied to the Verde River as well as all other tributaries of the Gila. Such violent fluctuations in flow, carrying with them such destructive debris, would be an anathema to navigation. Furthermore, such variations would provide an unreliable channel for the purposes of commerce or for recreation.

The *Twelfth Annual Report of the United States Geological Survey* reiterated the nature of Gila Basin streams, only this time they were specifically listed by name. Describing the Verde, Salt, Hassayampa, San Pedro, and Agua Fria rivers as sources of potential irrigation water, the report stated that:

> 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. These 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.[69]

The dramatic fluctuation that typified the entire Gila Basin was more specifically noted in the *Eighteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1896-97*. This volume contained a table showing the Verde River's monthly discharge at its mouth. According to the table, in January 1895 the maximum discharge had been 33,000 cubic feet per second, while the minimum had been only 527 cubic feet per second.[70]

The *Nineteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1897-98* further confirmed the agency's determination that the Verde River was highly

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[68] *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.

[69] *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.

[70] *Eighteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1896-97, Part IV-Hydrography* (Washington D.C.: U.S. Government Printing Office, 1897), p. 297.

erratic in flows. The author of the report wrote that the bed of the Verde at McDowell station, approximately a half mile above the stream's mouth:

> is similar to the one of Gila River – sandy and liable to change during a slight rise. . . . The bed of the river evidently changed during the last freshet, scouring out [the channel]. . . . The river fluctuated in this channel until August 23.[71]

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 topics and geographic areas, some examined subjects which shed light on the nature of the Verde 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. A number of these studies detailed the widely fluctuating flow of the Verde through tables. These indicated that at some times of year the stream had less than 100 cubic feet per second in it, while at other times flows could exceed 100,000 cubic feet per second.[72]

In addition to detailing the unpredictable flows of the Verde in tables, the U.S. Geological Survey's Water Supply Papers also offered textual descriptions of the stream's characteristics. For instance, Frederick H. Newell, reporting in 1902 in Water Supply Paper No. 85, observed that the "channel [of the Verde River] is similar to that of Salt River – sandy and liable to change during a

[71] *Nineteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1897-98, Part IV-Hydrography* (Washington D.C.: U.S. Government Printing Office, 1899).

[72] Arthur P. Davis, *Surface Water Supply of the U.S.-Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 66 (Washington D.C.: U.S. Government Printing Office, 1902); Arthur P. Davis, *Water Storage On Salt River, Arizona*, U.S. Geological Survey Water Supply Paper No. 73 (Washington D.C.: U.S. Government Printing Office, 1903); Frederick H. Newell, *Surface Water Supply of the U.S.-Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 75 (Washington D.C.: U.S. Government Printing Office, 1903); John C. Hoyt, *Report of Progress of Stream Measurements for the Calendar Year 1903, Part IV. Interior Basin, Pacific, and Hudson Bay Drainage*, U.S. Geological Survey Water Supply Paper No. 100 (Washington D.C.: U.S. Government Printing Office, 1904); R.I. Meeker, et al., *Surface Water Supply of Colorado River Drainage Above Yuma*, U.S. Geological Survey Water Supply Paper No. 211 (Washington D.C.: U.S. Government Printing Office, 1908); W.B. Freeman, et al., *Surface Water Supply of the U.S. 1907-8, Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 249 (Washington D.C.: U.S. Government Printing Office, 1910); W.B. Freeman, et al., *Surface Water Supply of the U.S. 1909, Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 269 (Washington D.C.: U.S. Government Printing Office, 1911).

slight rise."[73] The following year, in Water Supply Paper No. 73, Arthur Powell Davis offered a more detailed picture of the Verde River:

> Verde River drains the central portion of Arizona, and Upper Salt River the east central portion. Both streams are more or less torrential in character, the combined flow dwindling at times to about 100 cubic feet per second, and at other times reaching a volume more than one hundred times as great. . . . [T]he greater portion of the basin, however, is of a mountainous character, being cut with profound canyons and dotted by rugged mountains. . . .[74]

The following year, John C. Hoyt added further detail about the nature of the Verde River in Water Supply Paper No. 100. Commenting on the nature of the stream at Camp McDowell, Hoyt noted that:

> at low water the channel is oblique to the gaging section and measurements are made by wading at a point 400 feet above the cable. The channel is straight for a distance of 300 feet above and below the station, and has a width at low water of 100 feet and at high water of 450 feet. The current is swift. The right bank is high, rocky, clean, and is not subject to overflow; the left bank is low, clean, and is subject to overflow. The bed of the stream is composed of sand and is shifting.[75]

In 1911, Water Supply Paper No. 269 confirmed that the bed of the Verde River at Camp McDowell was "sandy and shifting."[76] And, in commentary revealing the irregular nature of the stream's flows, the Water Supply Paper added that:

> [f]rom June 11 to July 20, excepting July 6, measurements were made about 500 feet above cable by wading. Water too shallow at cable to make an accurate measurement. Beginning July 23, measurements were resumed from the cable.[77]

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[73] Frederick H. Newell, *Surface Water Supply of the U.S.-Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 85 (Washington D.C.: U.S. Government Printing Office, 1903), p. 21.

[74] Arthur P. Davis, *Water Storage On Salt River, Arizona*, U.S. Geological Survey Water Supply Paper No. 73 (Washington D.C.: U.S. Government Printing Office, 1903), pp. 9, 13.

[75] See generally John C. Hoyt, *Report of Progress of Stream Measurements for the Calendar Year 1903, Part IV. Interior Basin, Pacific, and Hudson Bay Drainage*, U.S. Geological Survey Water Supply Paper No. 100 (Washington D.C.: U.S. Government Printing Office, 1904), pp. 31-36.

[76] W.B. Freeman, et al., *Surface Water Supply of the U.S. 1909, Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 269 (Washington D.C.: U.S. Government Printing Office, 1911), p. 230.

[77] W.B. Freeman, et al., *Surface Water Supply of the U.S. 1909, Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 269 (Washington D.C.: U.S. Government Printing Office, 1911), p. 231.

Additionally, Water Supply Paper No. 329 reported that in the year of Arizona's statehood, records measuring the Verde's flow had been made at three gaging stations, one *near* Camp Verde (at Camp Childs), one actually at Camp Verde, one downstream at Camp McDowell. At the first two stations, the channel was recorded as being mostly of sand and clay, and of a shifting nature. The station near Camp Verde, however, recorded that the channel "appears fairly permanent." Nevertheless, indicating the river's shallow nature, even at the Camp Childs measuring station some of the measurements had to be taken by wading the stream (as they also had been done at the other stations at times).[78]

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 Verde 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 earlier in this chapter) provide yet more information about the nature of the Verde River prior to Arizona's statehood in 1912. 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 earlier in this chapter.] 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

[78] Robert Follansbee, et al., *Surface Water Supply of the U.S., 1912-Part IX. Colorado River Basin*, U.S. Geological Survey Water Supply Paper No. 329 (Washington D.C.: U.S. Government Printing Office, 1914), with quotation at p. 227.

the rates of increase of commerce from the ports at their mouths to and from the head of navigation in each case.[79]

Aside from the Wheeler Survey documents, other unpublished U.S. Geological Survey records also illustrate the nature of the Verde River. One particularly revealing unpublished report was undertaken by E.C. Murphy to determine potential hydroelectric power sites within Arizona. Although written shortly after Arizona became a state, Murphy's report was based on data accumulated for many years prior to statehood, and it had been done to conform to provisions of the 1910 enabling act allowing Arizona to join the Union. That law, however, also prevented the future new state from selecting parcels valuable as hydroelectric power sites as part of acreage granted to Arizona by Congress. Murphy's report was the result of an investigation to locate those hydroelectric power sites so the United States could retain them.[80]

Murphy's report was divided into three parts: an introduction, a section dealing with the Gila River, and a section covering the Salt River and its tributaries. Murphy noted that obtaining data on runoff on various streams was very difficult, but he nonetheless had been able to utilize some of the records of the U.S. Reclamation Service, the Arizona State Land Office, the U.S. Forest Service, and the Indian Irrigation Service. He also had consulted with county surveyors and engineers, and had visited many locations on horseback, on foot, or by wagon.

Regarding the Verde River, Murphy wrote that there was a long set of runoff data at Camp McDowell covering 1889-1914. The data, Murphy noted, indicated that there was an extreme variation in the Verde's flow on a monthly basis, with the highest rate of flow taking place in March (with a twenty-six-year average of 121,600 acre-feet) to a low in June (with an average of 8,700

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

[80] Each main part to Murphy's report began with page number 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.

acre-feet). Murphy observed that the "great variation in the annual run-off of streams in the Southwest is well illustrated" by these figures.[81]

Further indicating the erratic nature of the Verde was Murphy's discussion of the impact of silt on hydroelectric power possibilities. In this context, he commented that "only a comparatively small part of the run-off can be utilized for power on account of the floods and long dry periods – one-fifteenth to one-fifth in the case of the Verde River[.]"[82]

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 planned the Salt River Project, including the construction of Roosevelt Dam and Granite Reef Dam on the Salt River. While these structures were on the Salt River, part of the conception for the project, however, included utilizing the flows of the Verde River. In addition, the Reclamation Service undertook separate studies to determine the feasibility of building storage facilities on the Verde River. Since much of the work on the Salt River Project as well as the investigations of the Verde took place in the decade preceding Arizona's statehood, the Reclamation Service's records are extremely useful for determining the nature of the Verde River around that time.

[81] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Introduction, p. 13, Salt River Project Archives, Phoenix, Arizona.

[82] E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Introduction, p. 17, Salt River Project Archives, Phoenix, Arizona.

1. U.S. Reclamation Service Annual Reports

Like the Geological Survey, the Reclamation Service issued annual reports describing its activities, and these contain valuable descriptions of the Verde River.

Understandably, with Roosevelt Dam planned to be the principal storage facility for the Salt River Project and with the project itself to be located in the Salt River Valley, most of the annual reports' discussions of Arizona's streams focused on those areas. Nevertheless, the *First Annual Report of the Reclamation Service, from June 17 to December 1, 1902* commented on the nature of the Verde in the context of that stream being a tributary to the Gila:

> 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.[83]

The *Third Annual Report of the Reclamation Service, 1903-4* provided greater detail about planning for the Verde River and the nature of that stream. Noting that that stream was much "fresher" and that "the flow in the river is but slightly less" than the Salt, the report pointed out that two possible dam locations had been investigated on the Verde. These were the Horseshoe and the McDowell sites, and the report added that more investigations and estimates were underway to determine which location was the most practicable. Nevertheless, the report gave no indication that either of these proposed structures might impede navigation on the Verde River.[84]

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

[83] *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.

[84] *Third Annual Report of the Reclamation Service, 1903-4*, (Washington D.C.: U.S. Government Printing Office, 1905), p. 155.

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

Early controversy over the possible construction of Horseshoe Reservoir was especially revealing in relation to the navigability or non-navigability of the Verde River. In a 1911 letter, Reclamation Service Director Frederick H. Newell wrote to engineer Louis C. Hill that if the Service continued with plans for Horseshoe Reservoir, it would likely cause controversy over which lands were to be included in the Salt River Project due to the larger storage Horseshoe Reservoir would provide. In his letter to Hill, Newell did not indicate that any objections might arise to building the storage facility due to any possible detrimental impact on the commercial navigability of the Verde River. He did, however, explain his concern about a movement among Salt River Project water users to seek an extension of time to repay construction costs and how he thought that issue related to when Horseshoe Reservoir might be built. As Newell explained to Hill:

> We have already brought under irrigation a greater part of the land [in the Salt River Valley], but I understand that it will be necessary in the near future to exclude certain good lands and to definitely indicate which areas are to be irrigated, and which are to be thrown out. The doing of this will be difficult and disagreeable, will create many disappointments and arouse much antagonism; nevertheless it must be done. The people whose lands are excluded from irrigation will naturally turn at once to the question of an additional supply from the Horseshoe reservoir, and in my opinion, they should have fully in mind the fact that this will not be built until substantial repayments have been made by the lands irrigated. It seems to me wise to consider the making of tentative plans for the Horseshoe reservoir, with preliminary estimates of probable costs, and at the same time shut down all extension of the work until substantial repayments have been made.[85]

Horseshoe Reservoir continued to be controversial for many years, including those following Arizona's statehood in 1912. A large number of the documents chronicling the debate over the reservoir, although created after 1912, continued to shed light on whether the Verde was

[85] F.H. Newell to L.C. Hill, Nov. 25, 1911, "Salt River Project, Consulting Engineer Reports, January 1, 1907 - December 31, 1912," General Administrative and Project Records, 1902-1919, Entry 3, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives-Rocky Mountain Region, Denver, Colorado.

navigable prior to that time. For example, on March 13, 1914, Reclamation Service officials held a public meeting in Phoenix with water users under the Salt River Project to discuss additional ways to develop more water for use in the Salt River Valley. Topics proposed included pumping and the construction of a reservoir on the Verde River in Paradise Valley. Four days after the meeting, Reclamation Service officials wrote to the secretary of the interior detailing the outcome of the meeting, and the letter noted that there had been concern on the part of Paradise Valley residents regarding the proposed Verde River reservoir that its purpose was to increase acreage within the Salt River Project at the expense of available water supplies from the Verde River for the Paradise Valley. The Reclamation Service letter pointed out that the agency intended to print a public announcement that the water to be stored at the proposed Verde reservoir was only to supply 20,000 acres already being served under the Salt River Project that could not obtain adequate water from existing project sources. While the Reclamation Service letter clearly addressed misapprehensions by Paradise Valley water users that their water might be taken to irrigate large new areas of the Salt Valley, the letter contained no indication that there had been any opposition by navigation interests in the Verde Valley to the proposed reservoir during the many years the reservoir had been under consideration.[86]

Less than a month after the public hearing on ways to increase the Salt River Project's water supplies, Reclamation Service official F.W. Hanna responded to a letter he had received from G.F. Hart, president of the Paradise-Verde Water Users' Association. Hart had written on behalf of his constituents, who had requested that the federal government build a reservoir on the Verde River to irrigate their lands. Hanna, in his response, informed Hart that the proposed Horseshoe Reservoir, if built, was designed to help regulate Verde River natural flow water already being used by farmers in

[86] A.P. Davis, et al., to the Secretary of the Interior, March 17, 1914, "Salt River Project. Board of Survey Reports. 544-D," General Administrative and Project Records, 1902-1919, Entry 3, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives-Rocky Mountain Region, Denver, Colorado.

the Salt River Valley – not the Paradise Valley. Hanna claimed that Horseshoe Reservoir would be used to supplement storage at Roosevelt Dam. Nevertheless, flows of the Verde River were so irregular, according to Hanna, that Horseshoe Reservoir itself could not be relied upon alone, and therefore it was unsuitable as storage for the Paradise Valley. Hanna enclosed a table which showed that:

> there are several years in which there would be absolutely no water available for storage. Moreover in the series of years from 1896 to 1904, inclusive, there are four years, three of which are consecutive, in which there would be no water supply for storage in the Horseshoe Reservoir, and there would be very little available water for the whole period of nine years. It appears, therefore, that the water supply even though the Horseshoe Reservoir is not constructed for the Salt River Project would be very unreliable for additional lands which would have to depend upon this source of supply alone.[87]

Hanna's letter – as well as a significant body of subsequent documentation concerning the Horseshoe Reservoir proposal for the Verde River – underscored the highly erratic nature of the Verde River. The letter and other documents also demonstrated that even though planning for Horseshoe Reservoir had been underway for some time and was to continue for many more years, there had been and would not be any objections to blocking the river for commercial navigation by this major storage facility.

C. Records of the U.S. Indian Service

The Indian Service administered the Salt River and the Camp McDowell Indian reservations, through both of which the Verde River flowed. Federal Indian policy in the late nineteenth and early twentieth centuries was aimed at assimilating Indians into American society by training them in occupations such as farming. As a result, U.S. officials overseeing Indian reservations devoted a great amount of time to water resource development to facilitate irrigation on

[87] F.W. Hanna to G.F. Hart, April 11, 1914, file Arizona Surveys & Investigations, Paradise Valley (Verde River) thru May 1918, Box 299, Entry 3, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives branch, Rocky Mountain Region, Denver, Colorado.

reservations. Visiting Indian Service inspectors and the U.S. Indian agents at the Salt River and Camp McDowell reservations, therefore, created a considerable body of unpublished documentary evidence concerning the Verde River.

For example, reporting to the secretary of the interior on irrigation at the Camp McDowell reservation in 1905, Indian Service Inspector W.H. Code commented on the impact of flooding on the channel of the Verde River:

> The narrow valley of the Verde River embraced within the boundaries of this reservation has a steep gradient toward the river, and the Jones Canal [which served the reservation] winding its way around the base of foot hills for a distance of nearly six miles, interceps [*sic*] many drainage lines, which, in times of heavy stormes [*sic*], run vast quantities of water which sweep out canal banks and fill sections of the ditch with a heavy sand deposit. To further increase the difficulties, the banks of the Verde River at the head of ditch have suffered great erosion . . . and the river channel seems to have scoured down to a considerable depth, leaving the present canal grade elevated a distance of several feet above the grade of river.[88]

Further commentary on the vacillating nature of the Verde River's channel is contained in a May 20, 1905, letter from J.R. Meskimons, superintendent of irrigation for the U.S. Indian Service, to Indian Service Commissioner Francis E. Leupp. Meskimons was writing in regard to an irrigation survey that was in progress at the Camp McDowell Reservation. He wrote that:

> [t]he map shows the position of the river at the time the survey was made. It has, however, changed its course since, to the great detriment of the head and upper portions of the (Jones) canal. . . . When this survey was made the river had cut within about fifty feet of the canal in one place only, and that at an angle in the canal. I therefore cut a new canal about 700 feet long, thus straightening the old and removing the canal approximately 100 feet from the river. However the grade stakes were hardly set when the river again rose and cut away its bank until it approached to within ten feet of the canal in one place, and in no place for a distance of about 3000 feet is the river more than 50 feet from the canal. When the water again subsided the Indians cleaned the upper portion of the canal again and cutting to a very flat grade got water in the canal without the aid of a weir. . . . It can be readily seen that the canal is in a precarious condition, that one good heavy rain

[88] W.H. Code to Secretary of the Interior, March 11, 1905, file "Gila River 1905," District 4, Box 82, Entry 653, Record Group 75, Records of the U.S. Bureau of Indian Affairs, U.S. National Archives, Washington D.C.

> would destroy probably a mile of the upper end of same, besides washing out and filling up of the canal wherever the flood waters from the hills strike it.[89]

The type of flooding described in the preceding two letters was hardly unusual according to other Indian Service documents. On September 22, 1905, William H. Gill, farmer in charge of the McDowell Reservation, submitted a summary for inclusion in a report by the Department of the Interior. He wrote that the Indians' system of irrigation:

> is attended with great expense of time and labor. The Verde River, from which the water is diverted, is a mountain stream which becomes a raging flood with every freshet, washing away the embankment at every arroyo, and filling the [Indians'] ditch with sand. This is apt to occur both in the rainy season in summer and also during the winter.[90]

On February 10, 1909, C.R. Olberg, superintendent of irrigation, again noted the changing nature of the Verde's channel at Camp McDowell in a letter to W.H. Code:

> [A] flood fifteen feet in depth . . . came down the Verde River a short time ago. This flood also ruined large bodies of tillable land; so that now the channel of the Verde River is approximately a mile in width. A cross-section of the valley there would show three benches: the upper end, on which lies the irrigable land; the second a large flat consisting of gravel and sand bars, in which are imbedded numerous trees and other debris; and the lower one, in which is the present bed of the river. . . . [To irrigate Indian lands, it would be necessary to] place a brush and rock dam across the Verde, about 150 feet in length, raising the elevation of the water three feet. . . . Any general scheme of reclamation for the McDowell Indians should also provide for the control of the Verde River. The bed of this river – as already intimated – is rapidly approaching the condition that now obtains on the Gila. The Verde River flows through a flat of sand and gravel bars, from one-half to three-quarters of a mile in width, bordered by cut banks from five to twenty feet in height. It swings from one side of the flat to the other, and where it impinges against a cut bank, is continuously eroding away the land.[91]

Yet another Indian Service official commented in 1910 on the Verde River's erratic behavior and frequent channel changes at Camp McDowell:

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[89] J.R. Meskimons to Francis E. Leupp, May 20, 1905, Salt River Project Archives, Phoenix, Arizona .

[90] William H. Gill, "Report of Farmer in Charge of Camp M'Dowell Reservation," Sept. 22, 1905, Salt River Project Archives, Phoenix, Arizona.

[91] C.R. Olberg to W.H. Code, Feb. 10, 1909, file "Camp McDowell 1909," District 4, Box 73, Entry 653, Record Group 75, Records of the U.S. Bureau of Indian Affairs, U.S. National Archives, Washington D.C.

> The water proposition here under existing conditions is a very unsafe one. There is a sufficient amount in the Verde River to supply all the needs of the Indians located here but the uncertainty as to where the main channel will be from time to time makes the question of irrigation an uncertain one. Here the river is nearly, if not quite, a half mile wide from bank to bank. Today the main channel may be on one side and tomorrow one of the many floods of water many sweep down and change the entire course of the channel to the opposite side of the river, and pile up a sandbar between it and the head of the ditch; or, on the other hand, the swift current is liable to cut into the bank and ruin the intake for the canal by cutting out a deep channel any feet below the head of the canal, leaving it high and dry. . . . [The] present canal is constructed for some distance through a sandbar and then for some distance follows near the bank of the river. Just at the present time, this canal is affording a good supply of water but the element of uncertainty as to its permanency, reduced the assurance of raising a crop almost to the minimum. The first floods coming down may render it absolutely useless.[92]

D. Conclusions to Chapter 3

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) as well as the records of the U.S. Indian Service consistently portrayed the Verde River as highly erratic with unpredictable flows and a shifting channel. Such a stream could hardly provide a reliable means of water-borne commerce.

[92] Report of Inspector Joe H. Norris, Camp McDowell, Arizona, April 9, 1910, Salt River Project Archives, Phoenix, Arizona, pp. 5-6.

CHAPTER 4: MISCELLANEOUS DOCUMENTS, NEWSPAPER ARTICLES, AND PHOTOGRAPHS

The following miscellaneous documents, newspaper articles, a recent historical study, and 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 Verde River.

A. Miscellaneous Documents and Newspaper Articles

Included in this discussion are textual records such as legislative pronouncements, the observations of irrigation enthusiasts, statements by local residents, commentary by an observer seeking to establish a national forest in lands through which the Verde River flowed, and recent historical studies. This material, which ranges chronologically from 1865 to 1986, supports the findings in other parts of this report that the Verde River was erratic, unreliable, and blocked by obstructions such as sandbars, gravel beds, boulders, and diversion dams. These documents are representative of many more illustrating the same conclusions.

As early as 1865, members of the Arizona Territorial Legislature, meeting in its second session, had reached the conclusion that the Verde River was not navigable. On December 28, 1865, the legislators passed a "Memorial Asking Congress for an Appropriation to Improve the Navigation of the Colorado River." Seeking $150,000 to remove obstacles such as sand bars, snags, boulders, and other obstructions in the Colorado's bed, the memorial declared that "*the Colorado River is the only navigable water in this Territory[.]*" (Emphasis added.) The memorial also noted that if the improvements were carried out, the Colorado would be navigable as far as

Callville, Nevada (today, submerged by Lake Mead), where a wagon road would connect with Salt Lake City.[93]

About six years after the Arizona Territorial Legislature declared the Colorado River to be the only navigable stream in the territory, *The Miner* newspaper published a lengthy description of Arizona Territory. Providing considerable detail about the region in an article published on February 25, 1871, the paper listed the territory's principal rivers, and like the Arizona Territorial Legislature in 1865, *The Miner* indicated that the Colorado River was navigable within the territory, but the paper made no similar observation about other Arizona rivers. "The principal rivers," *The Miner* stated, "are the Colorado, which is navigable for hundreds of miles, the Gila, Salt, Verde, Bonita, Prieta, San Pedro, White, Sipicue, and Little Colorado."[94]

The erratic nature of the Verde River and its lack of navigability were emphasized in January 1874, when Prescott's *Weekly Arizona Miner* newspaper carried a brief note about the stream's flooding:

> Mr. Wm. Head is up here from the Verde, but will shortly return. He was in our office this morning and stated that the Verde River was very high – at the time of the latest departure. It was running all over the low valleys. Mr. Peter Arnold lost a wagon in the flood.[95]

The *Weekly Journal-Miner* confirmed the extent of the Verde River flood the following week:

> Writing from Camp McDowell, under the date of the 19th instant [this month], Mr. John Smith, the post trader, uses about the following language: Have had three days steady rain. The Verde River rose 17 feet, and was about one mile

[93] "Memorial Asking Congress for an Appropriation to Improve the Navigation of the Colorado River," *Acts, Resolutions, and Memorials of the Territorial Legislature of Arizona, 1865* (N.p., n.d), copy at Arizona Historical Foundation, Arizona State University, Tempe, Arizona.

[94] "Facts about Arizona," (Prescott) *The Miner*, Feb. 25, 1871.

[95] [No title], (Prescott) *Weekly Arizona Miner*, Jan. 23, 1874.

> wide. The oldest white residents here assert that they had never before seen such a "lot" of water in the Verde.[96]

Eight months after John Smith noted the rapid rise in the Verde at Camp McDowell, Prescott's *Weekly Journal-Miner* carried similar comments about another Verde River flood:

> Albert Jackson and another man arrived here recently from the Verde River and say that while hunting and fishing below the settlements on said stream they were driven from the narrow bottom lands by a great rise in the river, which rise was caused by a water-spout or cloud-burst. They say that the river rised [*sic*] about fifty feet in a short space of time.[97]

Barely five months later, the *Weekly Arizona Miner* carried a story about yet another Verde River flood:

> The Rio Verde River commenced rising yesterday morning, and rose three feet during yesterday. This morning the angry torrent is rushing southward with terrific force and the muddy water has overflowed the meadows, making it dangerous to ford or attempt to cross.[98]

Three months later brought another Verde River flood story, this time noting that two individuals had nearly drowned in a Verde flood:

> Tuesday last, as Geo. Cary and Otto Webber attempted to cross the Verde River in a light wagon drawn by two horses; both men and horses found more water than they could well navigate. So, abandoning wagon and team, Cary and Webber paddled for the nearer shore, which they reached, while the horses were swept downstream and would have perished had it not been for a friendly snag which freed them from the wagon and so enabled them to reach the "other shore," where, after a short run, they were caught up and taken care of by some soldiers at Camp Verde. Loss, by this "ducking," eight pair of blankets, a fine rifle, etc., etc., belonging to Cary and Webber; and to J.H. Marion, the unfortunate owner of the "rig," about one hundred dollars, in loss of horse flesh, bolts, and other wagon rigging. Solemneholy [*sic*] fact – the "boys" were sober when they walked into the watery trap.[99]

Although there were an extremely large number of news stories throughout the years before Arizona's statehood in 1912 about other Verde River floods (several of which led to

[96] "A Big Verde," (Prescott) *Weekly Journal-Miner*, Jan. 30, 1874.
[97] "Flood in Verde," (Prescott) *Weekly Journal-Miner*, Aug. 8, 1874.
[98] "Verde," (Prescott) *Weekly Arizona Miner*, Jan. 22, 1875.
[99] "A Swim for 'Lives,'" (Prescott) *Weekly Arizona Miner*, April 2, 1875.

drownings), articles also appeared describing other aspects of the Verde River. For example, in September 1875 – about five months after Cary and Webber nearly had drowned in the Verde – the *Weekly Journal-Miner* ran a news story aimed at answering many questions that had been sent to the paper about Yavapai County. Among the information about farming and life there, the newspaper also described water sources and observed that while there was ample water available, none of the region's streams were navigable:

> Our mountains contain fine, clear gravel-bottomed streams and lakes, valleys of great beauty and varying in length and width spread out in every direction among the mountains. The San Francisco or Verde River and the Colorado Chiquito (Little Colorado or Flax River) together with the Great Colorado with its wonderful Cañon, are the most important rivers of Yavapai, *but there is no navigable water in the county; all freight is moved by large trains of pack mules or heavy wagons drawn by from four to twenty mules to the wagon*. [Emphasis added.][100]

Not only did the Prescott *Weekly Journal-Miner* directly state that the Verde River was not navigable, but various activities involving the stream's waters also confirmed the Verde's lack of navigability. For instance, the *Weekly-Journal Miner* reported in October 1889 that a dam had been constructed across the Verde River to supply a mill – with no objections from boating interests:

> The above-named [Etta] dam, constructed for the purpose of raising the Verde River, to supply water to the Etta mill, two miles below, was finished last Saturday, October 5th. All the gates were closed, and for the first time there was no Verde River running below. No leaks were to be seen, and the works were all pronounced first-class in every respect. To relieve the pressure and prevent the river from flowing over the dam, a sluiceway with two gates is built in the middle of the river. The gates are shut sufficient to send water enough down the ditch to supply the mill.[101]

There were rare occurrences of boats on the Verde, but these occasions were infrequent, and sometimes the boats were on the river not to go up or down the stream but for other reasons.

[100] "Answers to Correspondents," (Prescott) *Weekly Journal-Miner*, Sept. 24, 1875.
[101] "The Etta Dam," (Prescott) *Weekly Journal-Miner*, Oct. 16, 1889.

For example, on March 4, 1891, the *Weekly Journal-Miner* carried an article about a boat being used to try to repair railroad facilities where those crossed the Verde River:

> Roadmaster Thomas Carrigan has had several immersions in attempting to repair the telegraph line and railroad track. In attempting to cross the Verde River the other day, on a raft constructed of [railroad] ties, his frail craft went to pieces, and but for the precaution of carrying a rope with him, he stood a good chance of being drowned.[102]

As this story indicates, while boats sometimes appeared such as Roadmaster Carrigan's, the overwhelming consensus of contemporaneous observers was that only the Colorado River was navigable in Arizona Territory, and that was partly due to the fact that the Verde River's flows varied enormously. An article published in 1892 noted that "[t]he Rio Verde, like all Western streams, is quite copious during the spring months from the periodical rains and melted snow, but during the summer and autumn it is only a creek of 500 inches." Such variations in flow would have made the Verde River extremely difficult to use for regular navigation.[103]

Indeed, the huge variations in the Verde River's flows also caused major movements of the river's channel that would have impaired navigation. As the *Weekly Journal-Miner* reported on February 19, 1896, following spring flooding:

> some dark morning you hear a roar like a mighty wind tearing through a forest, and here it comes – a solid head of water – swift by reason of its great incline, and dark with the soil of the ranchers' valuable land. Then, when it falls, the work of destruction still goes on. The high banks, having become saturated, crumble from beneath, and day and night one can hear the sound of large portions of land falling into the water. I tell you this quiet little Verde River is a brilliant deception. Every flood we have it changes its current. One year it ripples up against this side, and the next it purrs and murmurs its deceptive little song clear across on the other side, and so back and forth, back and forth, always demanding a toll, and taking it too, with a lavish and liberal hand. The great question now when one wants to buy a ranch is, will the river take it? This too is the question in locating

[102] "From Thursday's Daily," (Prescott) *Weekly Journal-Miner*, March 4, 1891.

[103] "The Rio Verde Company," *Phoenix Republican*, May 1892 (precise date unknown), reprinted in David M. Goodman, comp., *Arizona Odyssey* #2330 (Tempe: Arizona Historical Foundation, 1969).

> [irrigation] ditches, everything must be put as far out of the way of the river as possible.[104]

Given the Verde's substantial flood flows during the spring, it is not surprising that interest emerged to dam the river to conserve its waters for irrigation. For instance, on January 17, 1898, the Rio Verde Canal Company recorded a claim with the Maricopa County Recorder for 5,000 cubic feet per second of Verde River water. In the claim notice, the water company stated its intention to "build and maintain a diversion dam across the Verde River . . . of the height of ninety-two (92) feet above the bed of said stream." The company also intended to build other dams, one at what later was known as the Horseshoe Reservoir site, another at the Lower Verde Reservoir site, and third named simply Storage Reservoir No. 4. Yet despite the fact that these dams would undoubtedly impede navigation, there is no evidence of any protests against the proposed dams by any navigational interests.[105]

There was at least one proposal to float down the Verde River from Jerome to Phoenix, but even this 1905 news story that appeared in the *Arizona Silver Bulletin* made it clear that the trip was likely to be fraught with difficulties. Moreover, there were no later press articles indicating that the boating adventure actually had taken place. The *Bulletin* stated:

> Visitors here from Jerome state that Charles Hooker, William Cox, Ralph Smith, and Walter Miller are preparing to leave that city to cruise to Phoenix on the Verde River. They will have about 200 miles of boating, and expect to make the trip in seven days. In places they will have to shoot rapids, and in others it will be necessary to carry their boat.[106]

Early Phoenix resident and member of Congress Carl Hayden also indicated that the Verde was not navigable. In his speech in front of the U.S. House of Representatives on February 3, 1916, Hayden spoke about flood control on non-navigable streams. House

[104] "Our Upper Verde Letter. A Deceptive River – Farmers Preparing for Spring – A New Ditch Enterprise," *Weekly Journal-Miner*, Feb. 19, 1896.

[105] "Claim of the Rio Verde Canal Company" (with quotation at page 1), Jan. 17, 1898, Salt River Project Archives, Phoenix, Arizona.

[106] "Items from Prescott and Yavapai County," *Arizona Silver Bulletin*, April 27, 1905.

Resolution 122 had been introduced by the speaker of the House, and Hayden interpreted the speaker's intention to be the creation of "a committee having jurisdiction over all bills relating to flood control whether the floods occur on navigable or non-navigable streams." Hayden explained his support of this resolution: "I come from a State where we have dry rivers and no harbors, and I want to see a committee established that will give consideration to the flood problems on non-navigable streams." In commenting on the constitutionality of federal funding for flood control on non-navigable streams, Hayden argued that such an expenditure not only had local advantages, but also was in the national interest. He claimed that railroads often were affected by floods, which hurt interstate commerce, and that postal deliveries also were interrupted by flooding. Hayden further argued that national defense would be assisted by funding for flood control, asserting that "troops cannot be readily moved or supplied when the rivers are in flood."

Hayden's remarks made it clear that in his view all Arizona streams were non-navigable, including the Verde River. What Hayden sought, therefore, was money to curb flooding on the state's unpredictable streams, including the non-navigable Verde.[107]

Even the work of a recent historian, Karen L. Smith, noted that no river in Arizona provided water transportation. In her doctoral dissertation, which was later published as *The Magnificent Experiment: Building the Salt River Reclamation Project, 1890-1917* (1986), Smith described the Phoenix area:

> On the face of it, the growth of metropolitan Phoenix from a dusty village located near the Salt River to the ninth-largest city in the United States has been something of an anomaly. There was no major railroad connection to Phoenix

[107] Carl Hayden, "Speech of Hon. Carl Hayden, of Arizona, in the House of Representatives, Thursday, February 3, 1916," folder 11, box 653, Carl Hayden Papers, Mss. 001, Arizona State University, Tempe, Arizona.

> until the 1920s, *no harbor or navigable river* to spawn commerce, and no major trail or crossroads to lure tired travelers to stop. [Emphasis added.][108]

B. Historical Photographs

In addition to the voluminous textual evidence retrieved in research, numerous photographs also were obtained from a variety of archives. Some of the photos show the Verde to be extremely shallow, while others demonstrate the devastation of the regularly occurring floods. One photograph from the mid-1880s even shows a small rowboat on the Verde River. Nevertheless, this instance of a watercraft on the stream (near Fort Verde) was clearly the exception and not the rule, and the boat was probably used to cross the river much like Roadmaster Thomas Carrigan's 1891 use of a boat to try to repair railroad facilities. The photographs, spanning many years from long before statehood to the years immediately after Arizona joined the Union, provide visible evidence of the erratic and unreliable nature of the Verde River. These images provide visual documentation leading to the same conclusions reached in the unpublished and published document collections that the Verde River was not navigable.

[108] Karen L. Smith, *The Magnificent Experiment: Building the Salt River Reclamation Project, 1890-1917* (Tucson: University of Arizona Press, 1986), p. ix.

Figure 20: Man on horseback crossing the Verde River, date and site unknown. Source: Jerome Historical Society, Jerome Arizona.

Figure 21: Prehistoric ruins at the confluence of the Verde River and Oak Creek, ca. 1880. Source: Fort Verde State Historic Park, Camp Verde, Arizona.

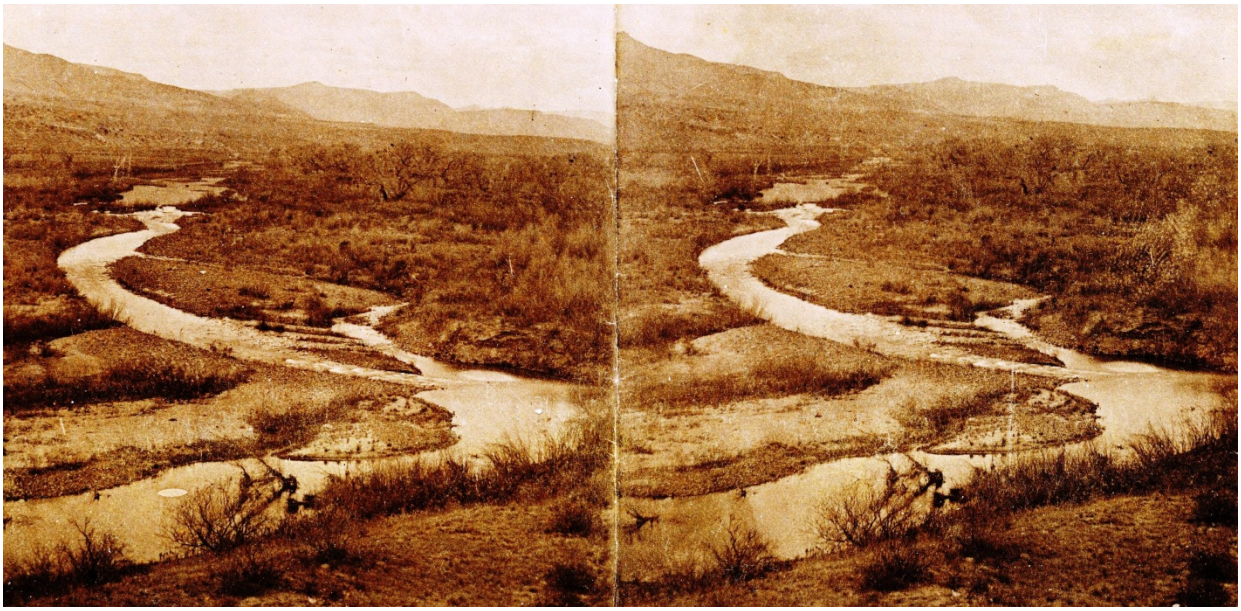

Figure 22: Stereographic photo of Verde River, site unknown, ca. 1880. Source: Sharlot Hall Museum, Prescott, Arizona.

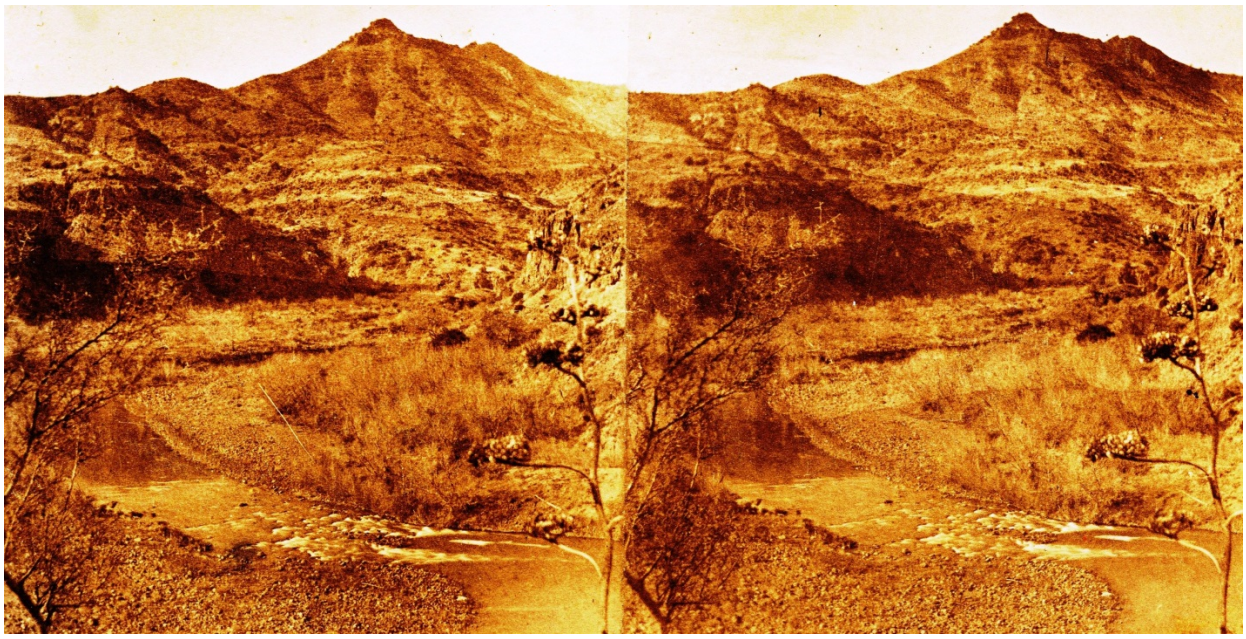

Figure 23: Stereographic photo of Verde River, site unknown, ca. 1880. Source: Sharlot Hall Museum, Prescott, Arizona.

Figure 24: Stereographic photo of man and two horses crossing the Verde River, site unknown, ca. 1880. Source: Sharlot Hall Museum, Prescott, Arizona.

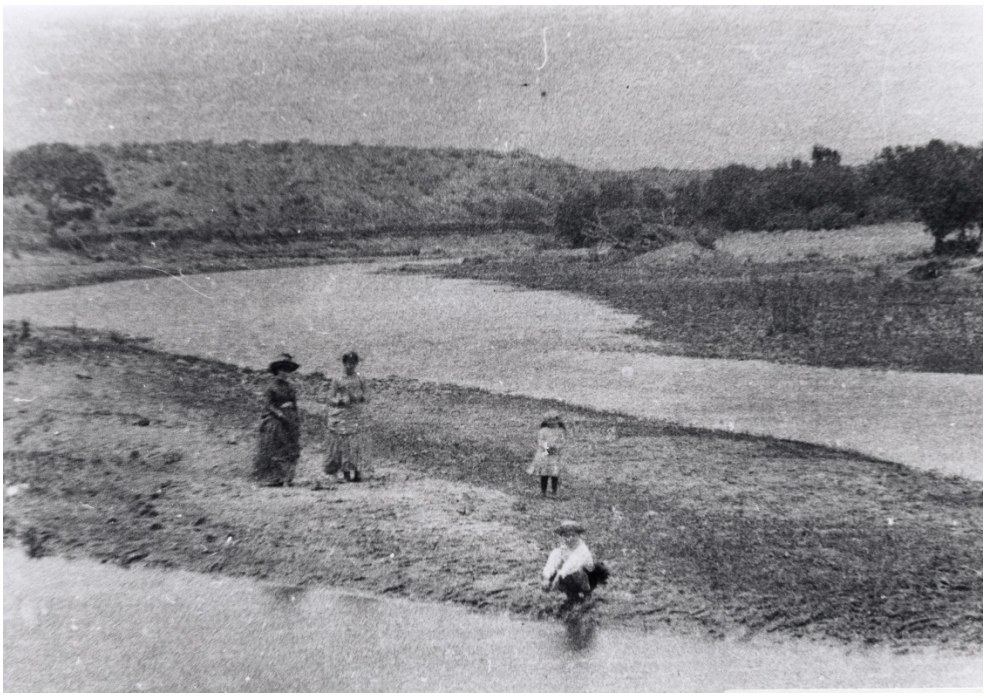

Figure 25: Fort Verde residents on sand bar in Verde River, ca. 1885. Source: Fort Verde State Historic Park, Camp Verde, Arizona.

Figure 26: Soldiers from Fort Verde in a boat on the Verde River, ca. 1885. Source: Fort Verde State Historic Park, Camp Verde, Arizona.

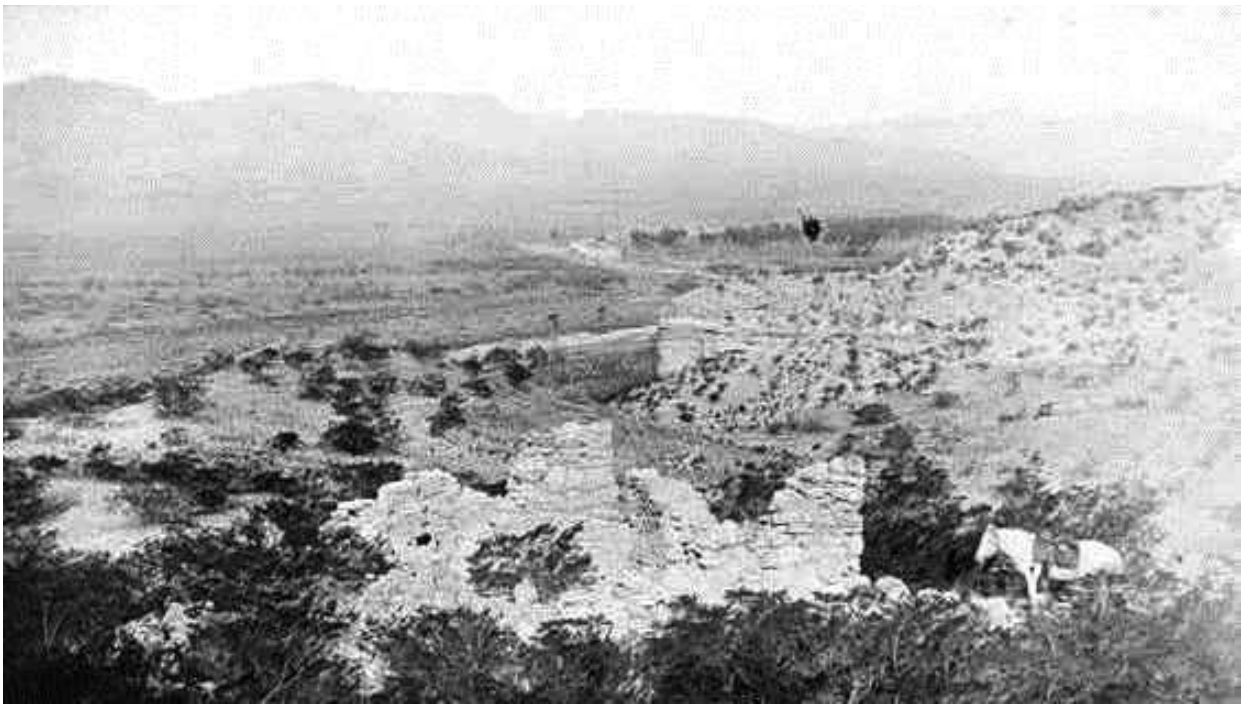

Figure 27: Verde River near Fort Verde, ca. 1885. Source: U.S. Library of Congress, Washington, D.C.

Figure 28: Verde River near Fort Verde, ca. 1885. Source: U.S. Library of Congress, Washington, D.C.

Figure 29: Cottonwood Ford near Fort Verde, ca. 1885. Source: Fort Verde State Historic Park, Camp Verde, Arizona.

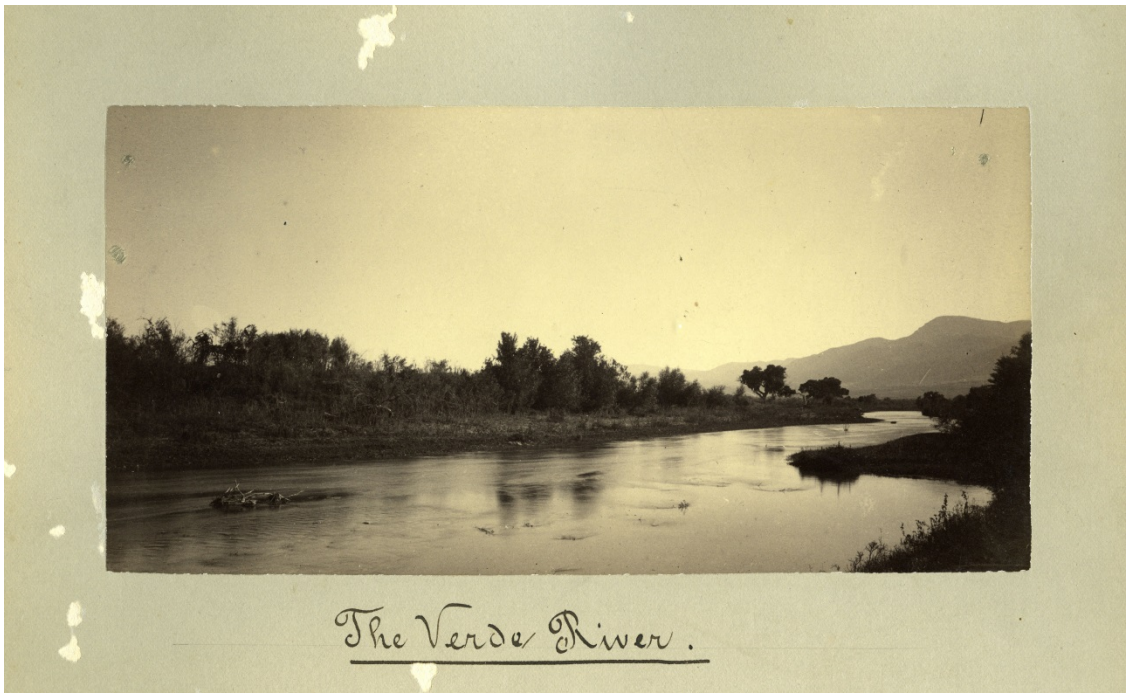

Figure 30: Verde River, site unknown, ca. 1900. Source: Sharlot Hall Museum, Prescott, Arizona.

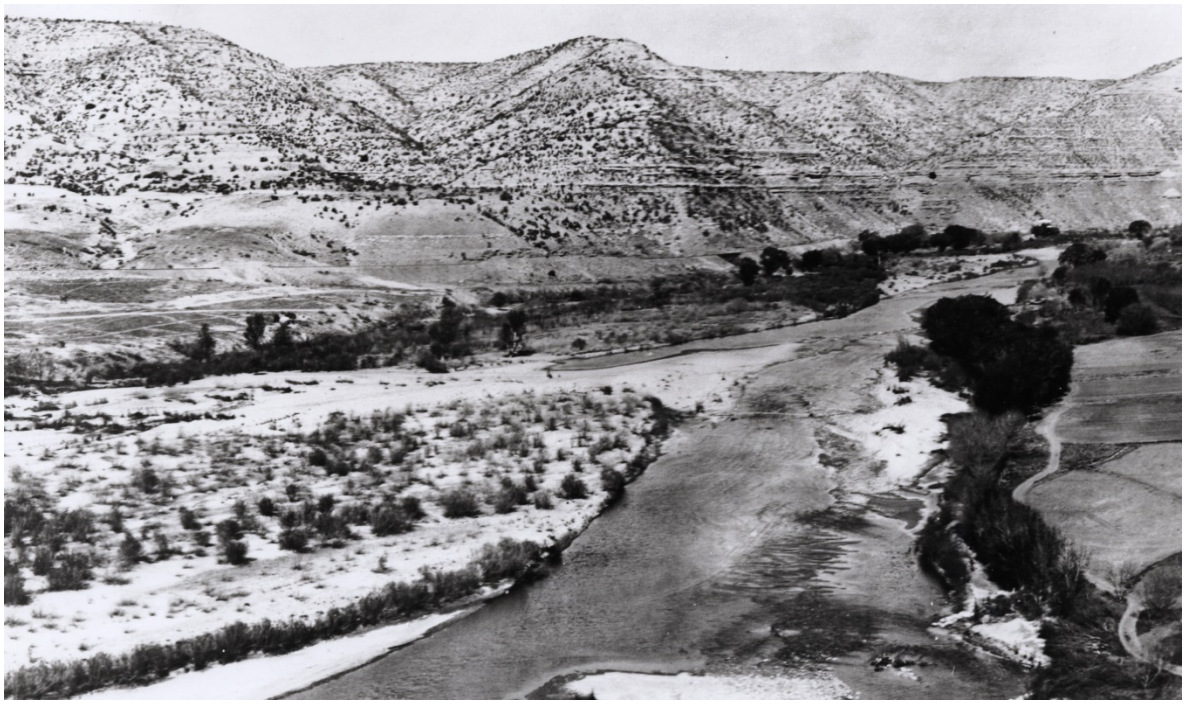

Figure 31: Verde River near Clarkdale, March 1914. Source: Special Collections, Arizona State University, Tempe, Arizona.

Figure 32: Fording the Verde River near Bridgeport, 1914. Source: Jerome Historical Society, Jerome, Arizona.

Figure 33: Verde River flood, January 28, 1916. Source: Jerome Historical Society, Jerome, Arizona.

Figure 34: Verde River flood, Clarkdale, Arizona, January 28, 1916. Source: Jerome Historical Society, Jerome, Arizona.

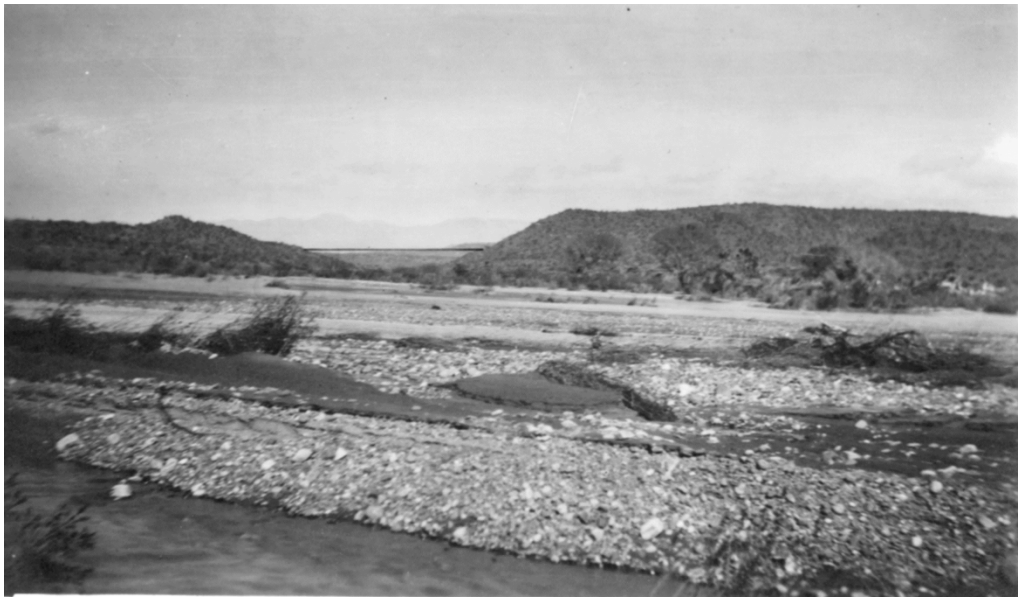

Figure 35: Horseshoe dam site, ca. 1920. Source: Records of the Bureau of Reclamation, U.S. National Archives Branch, Denver, Colorado.

Figure 36: Camp Verde dam site, ca. 1920. Source: Records of the Bureau of Reclamation, U.S. National Archives Branch, Denver, Colorado.

Figure 37: Camp Verde dam site, ca. 1920. Source: Records of the Bureau of Reclamation, U.S. National Archives Branch, Denver, Colorado.

Figure 38: Lower Verde River, ca. 1932. Source: Arizona Historical Society, Tucson, Arizona.

Figure 39: Verde River, site unknown, ca. 1932. Source: Arizona Historical Society, Tucson, Arizona.

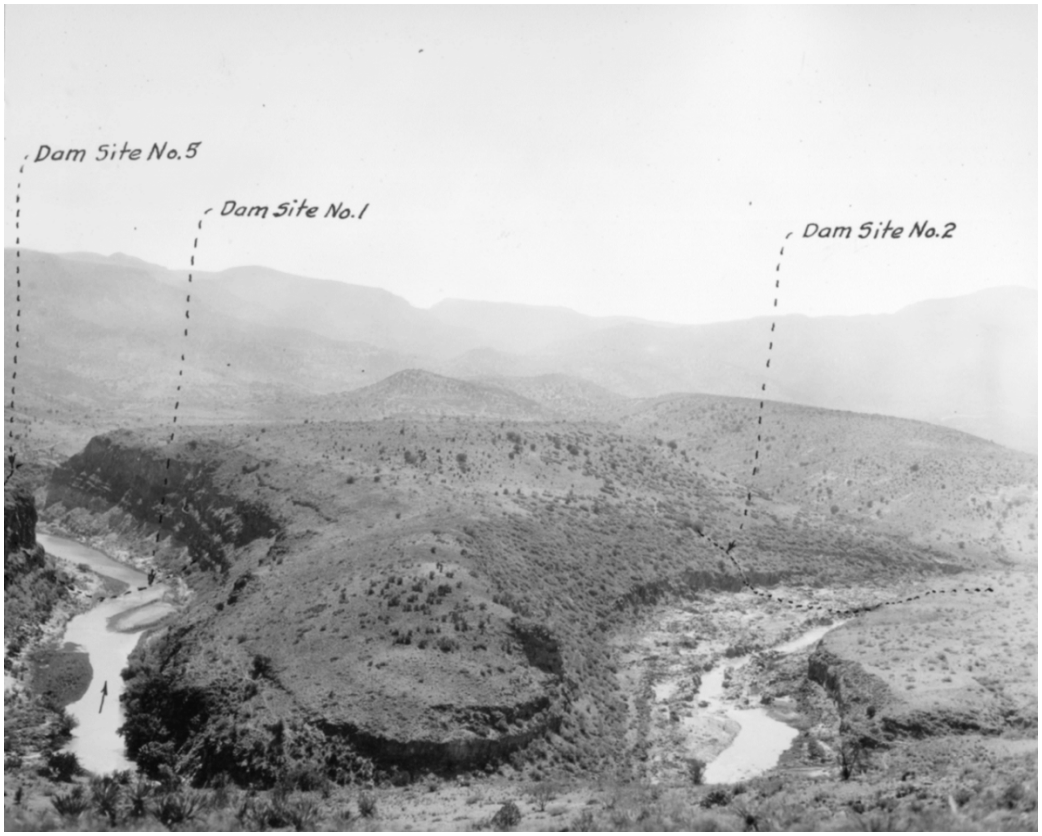

Figure 40: View of possible dam sites, 1934. Annotations are on original. Source: Records of the Bureau of Reclamation, U.S. National Archives Branch, Denver, Colorado.

Figure 41: Bartlett dam site, 1936. Source: Records of the Bureau of Reclamation, U.S. National Archives Branch, Denver, Colorado.

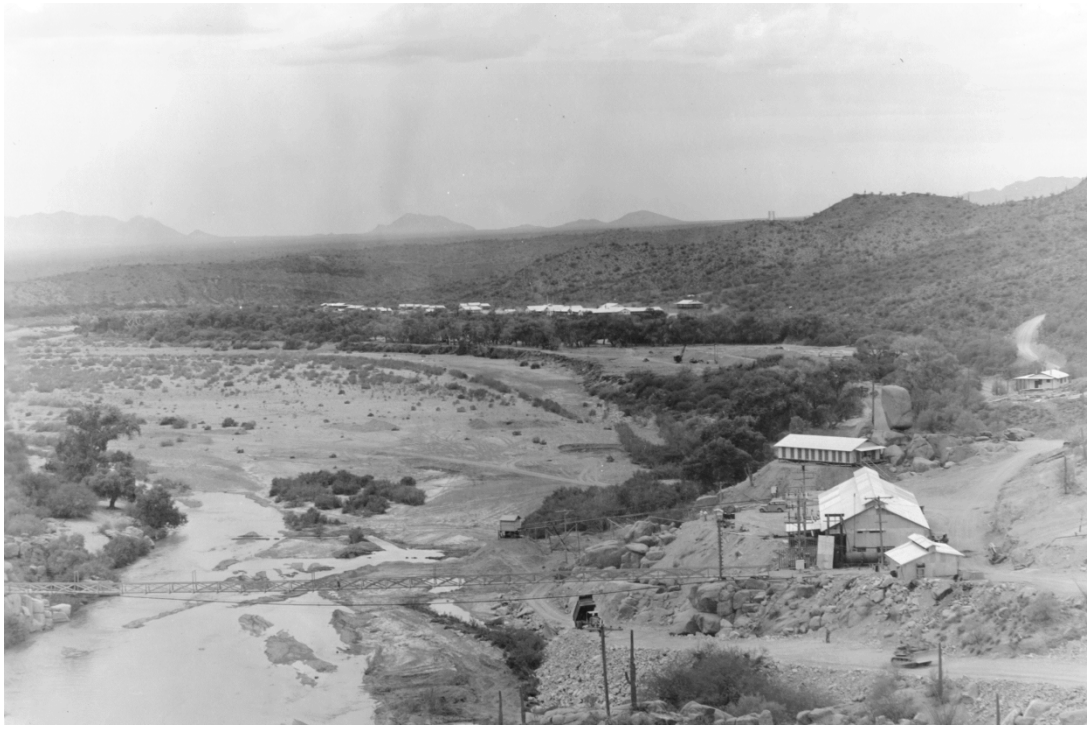

Figure 42: Bartlett dam site, 1936. Source: Records of the Bureau of Reclamation, U.S. National Archives Branch, Denver, Colorado.

C. Conclusion to Chapter 4

The wide variety of the miscellaneous documents, newspaper articles, and historical photos discussed above all point to the same conclusion that the Verde River was not navigable prior to or at the time of Arizona statehood in 1912. The documents, news stories, and photos clearly demonstrate that the Verde River unreliable, erratic, and dangerous at times. Fluctuating flows, channel changes, and dams, would have been major impediments to any navigation on the Verde River.

CHAPTER 5: WESTERN WATERCRAFT

At the turn of the twentieth century, the only waterway in the Southwest considered by most observers to be navigable was the Colorado River. A stream significantly larger than the Verde River, the Colorado nevertheless was frequently barely navigable due to shifting sandbars, rapids, a changing channel, and major floods. But because the Colorado did, on occasion, see steamboat traffic, it became a testing ground for boats with shallow drafts and lightweight construction. Navigated from its mouth at the Gulf of California past Yuma to approximately present-day Bullhead City, Arizona, the Colorado River was the subject of many stories in multitudes of newspapers, promotional publications, as well as in published government documents. The significance of such boating on the Colorado River 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, not only on the Colorado, but on other rivers as well.

From accounts of expeditions on the Colorado River, 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 was considered because water travel in the nineteenth century was by far the most economical method to transport goods and other commerce. 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 regular navigation occurred. Therefore, a brief examination of the history of navigation on the Colorado in this chapter can provide useful insight into the nature and technology of watercraft used for transportation on that river and whether similar craft might have plied the Verde River.

Aside from accounts of actual expeditions on the Colorado River, additional information about southwestern watercraft operation can be found in reports written to describe general

advances in boat construction as well as from historical photographs, both of which are also discussed in this chapter. This information, when combined with experiences on the Colorado River, can help shed light on the navigability of Arizona's streams such as the Verde River.

A. Accounts of 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 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, fort locations, 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.

1. J.C. Ives and the Ship *Explorer*, mid-1850s

One of the first such journeys was led by Lieutenant Joseph Christmas Ives (better known as J.C. Ives). Ives was sent in the mid-1850s to pilot a small steamboat, the *Explorer*, up the Colorado River from the Gulf of California to the Virgin River to assess the Colorado's utility as a navigable waterway. Following his return to the East, Ives wrote a report about his expedition (which was later published). Completed on March 23, 1858, Ives's written pre-publication account (available at the National Archives branch in College Park, Maryland) discussed the problems associated with navigating the Colorado River. Ives explained that the Colorado River was extremely difficult to navigate because the "channel is exceedingly circuitous and constantly shifting," and he further noted the repeated presence of sand bars and shoals. Ives added:

> 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.[109]

Ives also offered a recommendation for a type of boat for future use on the Colorado River if the U.S. Government wanted to use that stream for transportation on a regular basis. Due to the hazardous and difficult conditions, Ives suggested 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 draught when light, not exceeding 12 inches." Ives included in his published report a sketch of the *Explorer*, which is reproduced below together with several drawings of the craft as it went through the lower Colorado River's gorges. Following those items is a view of a similar boat going up the Colorado River in about 1870. Although Ives believed that five trips a year could be made on the Colorado above Yuma in such 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 River.[110]

[109] 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).

[110] 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.

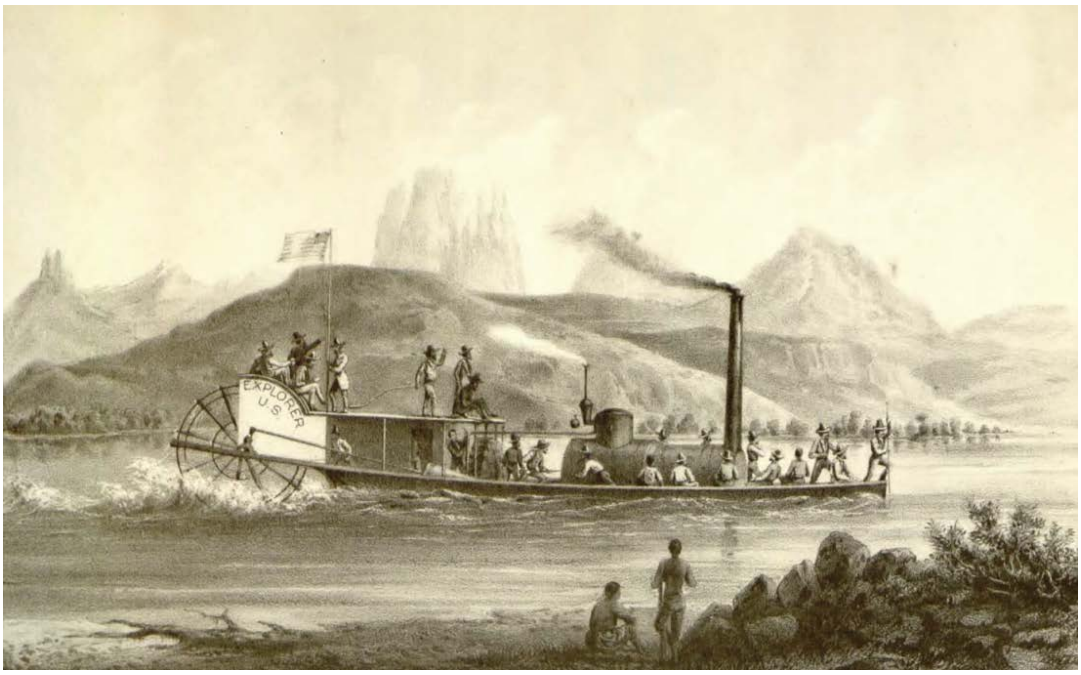

Figure 43: J.C. Ives's sketch of the *Explorer* navigating the Colorado River, ca. mid-1850s. Source: Joseph C. Ives, *Report upon the Colorado River of the West* (1861).

Figure 44: Drawing of Ives's exploration of the Colorado River at West Mohave Canyon, mid-1850s. Note Ives's boat at bottom of sketch. Source: Joseph C. Ives, *Report upon the Colorado River of the West* (1861).

Figure 45: Drawing of Ives's exploration of the Colorado River at Deep Rapid, mid-1850s. Note Ives's boat at right. Source: Joseph C. Ives, *Report upon the Colorado River of the West* (1861).

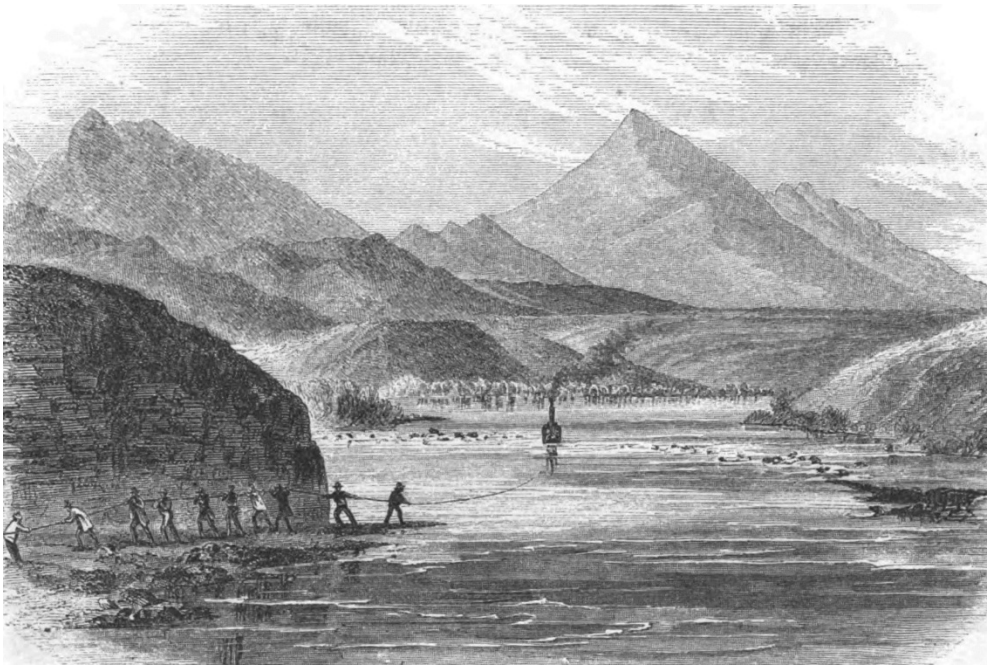

Figure 46: Drawing of Ives's exploration of the Colorado River – lining the boat through rapids, mid-1850s. Source: Joseph C. Ives, *Report upon the Colorado River of the West* (1861).

Figure 47: Photograph of the type of stern wheel steamboat suggested by J.C. Ives for navigating the Colorado River, circa 1870. This photo was taken near present-day Lee's Ferry, Arizona. Source: www.grandcanyonhistory.

2. John Wesley Powell and the Grand Canyon, 1869 and 1871-1872

Ives's expedition up the Colorado River in the mid-1850s may have been one of the earliest attempts to navigate that stream, but probably the most famous expeditions on the Colorado were the two led by explorer John Wesley Powell (see Powell in two photos below). Unlike Ives, who had used a steamboat to go upstream on the Colorado, Powell went downstream through the Grand Canyon (which Ives never reached) in wooden dories, first in 1869, and then again in 1871-1872. Powell made it clear after the first trip that the multitude of rapids and other obstacles along this portion of the Colorado River 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 crew on the first trip

proved to be so frightening that several crewmembers opted to climb out of the canyon (where they were subsequently killed by Indians) rather than continue on the river.[111]

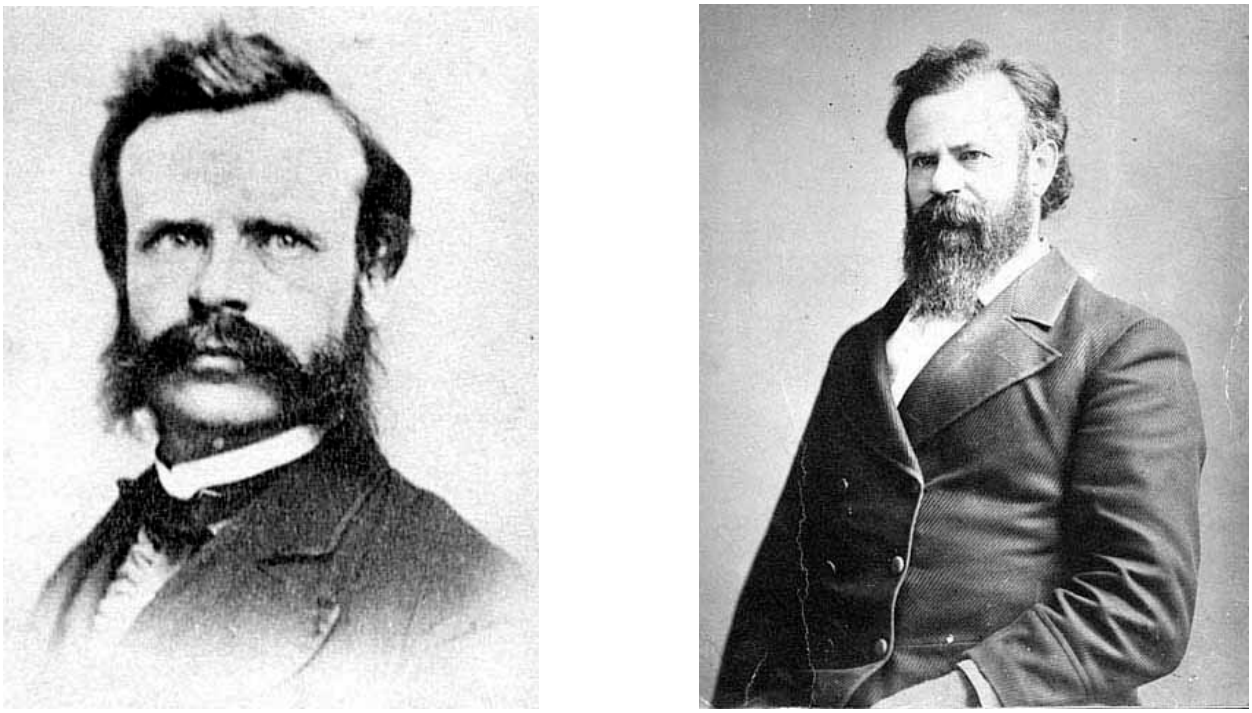

Figure 48: Photographs of John Wesley Powell in 1869 and 1874. Source: U.S. National Park Service online photograph collections.

Powell made a second trip down the Colorado River and through the Grand Canyon in 1871-1872, this time focusing more on gathering scientific information than he had on the first excursion. This expedition – unlike the first – was made during low water, and while the rapids on this trip were not as terrifying as during the first venture, the second journey still faced major difficulties bypassing rocks and rapids.[112] On this second trip, Powell brought a photographer, and

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

[112] 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 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).

some of the resulting photos documented the nature of the dories Powell used on both trips (see below).

Figure 49: Photograph of Powell's dories on the Colorado River, 1871-1872. Note the lashed-on armchair on the boat in the foreground; Powell commanded the expedition from the chair. Source: U.S. National Park Service online photograph collection.

Figure 50: Photograph of Powell's crew with dories in the Grand Canyon, 1871-1872. Source: U.S. National Park Service online photograph collection.

Figure 51: Photograph of a closer view of Powell's dories on the Colorado River, 1871-1872. Note the arm chair lashed to the top of the boat in the background. Source: Grand Canyon National Park Collection, Grand Canyon, Arizona.

Figure 52: Another photographic view of Powell's dories on the Colorado River, 1871-1872. Source: Grand Canyon National Park Collection, Grand Canyon, Arizona.

Figure 53: Photograph of Powell's dory tied up in the Grand Canyon with the armchair strapped on top. Note life rings tied to the chair. Source: U.S. National Park Service online photograph collection.

Figure 54: Photograph of Powell's expedition on the Colorado River, 1871-1872, with boats tied up. Source: U.S. National Park Service online photograph collection.

Figure 55: Photograph of John Wesley Powell's second expedition through the Grand Canyon, 1871-1872. Source: U.S. Library of Congress, Washington, D.C.

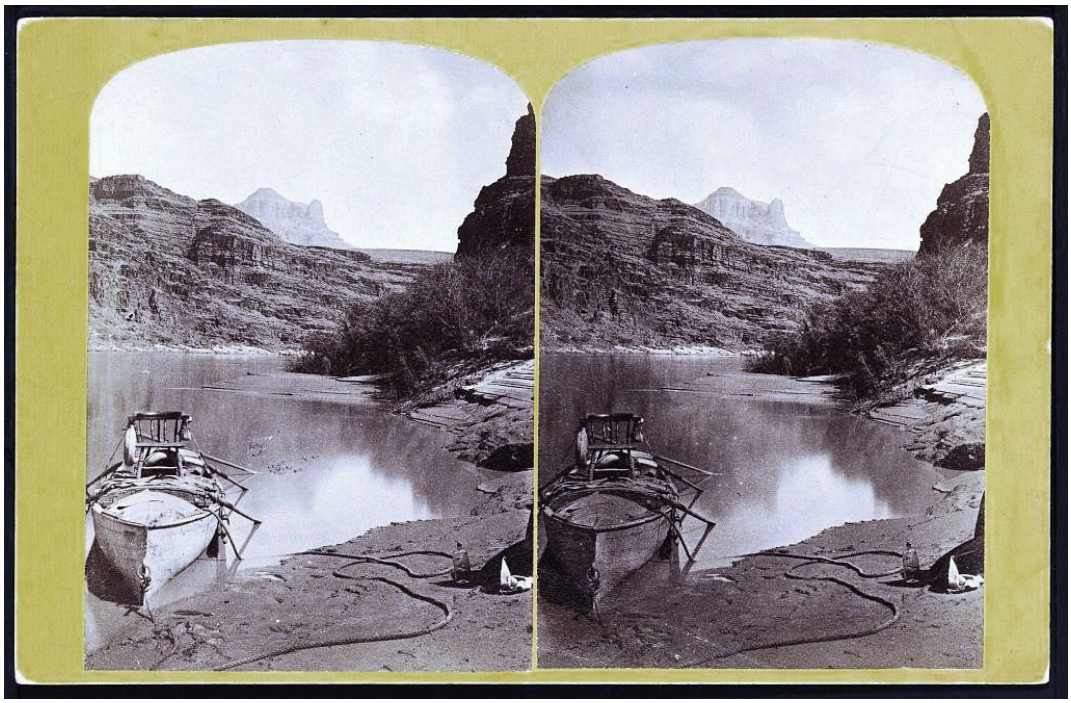

Figure 56: Stereographic photograph of the dory used by John Wesley Powell on the second expedition through the Grand Canyon in 1871-1872. Note that strapped to top of the dory is an arm chair, where Powell sat. Source: U.S. Library of Congress, Washington, D.C.

Figure 57: Photograph of one of Powell's boats at rapids in the Grand Canyon, 1871-1872. Source: U.S. National Park Service online photograph collection.

Figure 58: Photograph of Powell's boats tied up near rapids in the Grand Canyon, 1871-1872. Source: U.S. National Park Service online photograph collection.

Figure 59: Photograph of Powell's boats ashore in the Grand Canyon, 1871-1872. Source: U.S. National Park Service online photograph collection.

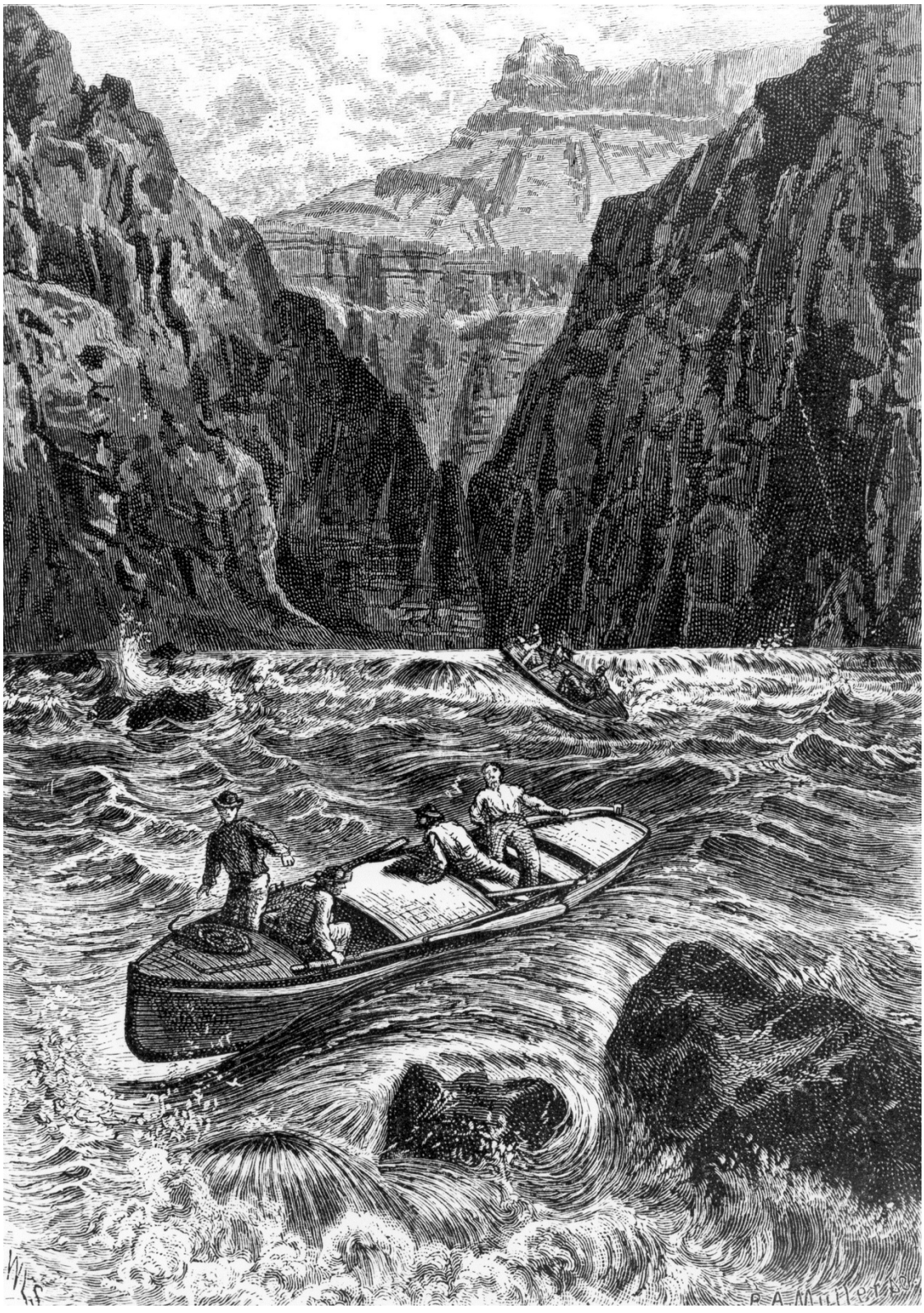

Figure 60: Sketch of the Powell expedition running rapids in the Grand Canyon, 1871-1872. Source: U.S. National Park Service online photograph collection.

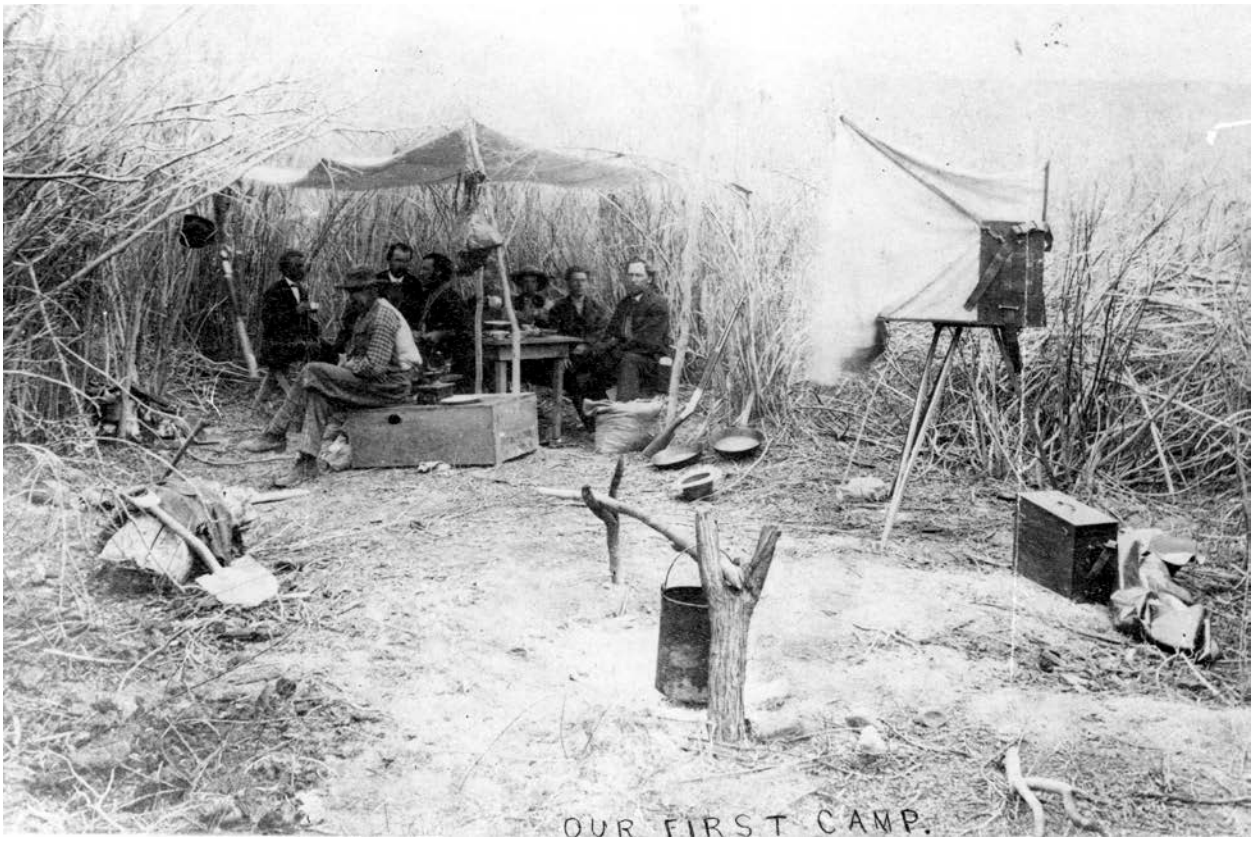

Figure 61: "Our First Camp," Powell expedition through the Grand Canyon, 1871-1872. Source: U.S. National Park Service online photograph collection.

3. George M. Wheeler Expedition up the Colorado River, 1871

Another Colorado River boating expedition – this time going upstream – was made in 1871 just as Powell was journeying through the Grand Canyon the second time. Commanded by Lieutenant George M. Wheeler, the upriver expedition had been directed by Congress to explore the American West and to make topographic maps of that region as well as to report on its characteristics. As part of his effort, Wheeler and his party were to locate the head of navigation on the Colorado River. Wheeler's expedition started from Camp Mojave, Arizona Territory, on September 15, 1871, and using small row-boats, the group made it upstream to the mouth of Diamond Creek (often having to portage around rapids). They covered a distance of two hundred sixty miles in thirty-one days. A photograph of Wheeler's departure from Camp

Mohave can be seen below. Following that is a stereographic view of the Wheeler expedition in the Black Canyon on the Colorado River (near where Hoover Dam is located today), and then appears a photograph of the expedition at “Camp Bighorn” on the Colorado.

Figure 62: Photograph of George M. Wheeler's upstream Colorado River expedition leaving Camp Mohave, Arizona Territory, 1871. Source: U.S. Library of Congress, Washington, D.C.

Figure 63: Stereographic photograph of Wheeler expedition up the Colorado River at Black Canyon, 1871. Source: U.S. Library of Congress, Washington, D.C.

Figure 64: Photograph of Wheeler expedition up the Colorado River, 1871, at Camp Big Horn. Note boats on the beach. Source: U.S. Library of Congress, Washington, D.C.

4. Other Accounts about Navigation on the Colorado River

Other reports of attempts to navigate the Colorado River added to the growing belief that the Colorado had some transportation possibilities. An early history of Arizona, entitled *The History of Arizona Territory Showing its Resources and Advantages with Illustrations: Descriptive of its Scenery, Residences, Farms, Mines, Mills, Hotels, Businesses, Houses, Schools, Churches, Etc.* (1884), for instance, provides excellent descriptions of the rivers of Arizona as well as boats in the late nineteenth century. This publication noted that the steamship *Explorer* (probably not Ives's boat discussed earlier in this chapter, which had fallen into disrepair) 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.[113]

While this account of a watercraft capable of navigating upriver on the Colorado River appeared promising, that view, however, should be tempered by the fact that *The History of Arizona Territory* – 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 American Southwest. Joseph Ives's earlier report, therefore, is probably more objective regarding the Colorado's possibilities as an upriver transportation artery, at least below the Grand Canyon. Nevertheless,

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

other attempts by steamboats confirmed that the Colorado River could, in fact, be used by such craft.[114]

Other accounts printed in U.S. Government documents further acknowledged the possibilities of using the Colorado River below the Grand Canyon as an artery of commerce and transportation. A January 30, 1907, letter from J.A. Mellon, the captain of the Colorado River steamer *Cochran*, to the Bureau of Corporations, noted that the *Cochran* weighed 237 tons and drew 20 inches of water when light and an additional 1 inch of water for every 10 tons of freight. According to other records of the Bureau of Corporations, another Colorado River steamship (actually, more like a barge), the *Silas J. Lewis*, weighed 100 tons and drew seven inches of water with no load and one inch more for every eleven tons.[115]

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 before and 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." The vessels, the report added, "used in the river trade are still mainly built of wood."[116] When specifically discussing river steamers, the report stated that:

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

[115] *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.

[116] *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.

> [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.[117]

Although the report conceded that little change had been made in the stern-wheel, light-draft steamers in several 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."[118]

Water Trails West, a more recent compilation of essays 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, indicates that boats larger than the one proposed by J.C. 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's boat), the *Mohave II* had a 32-foot beam. This was 10 feet wider than Ives's 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 feet in width. Further, these vessels were generally stern-wheeled, making them easier to navigate streams filled with sandbars and shallow water.[119]

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[117] *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.

[118] *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.

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

C. Conclusion to Chapter 5

The state of boating technology around the turn of the century makes it clear that the Verde River was not susceptible to navigation before or at the time of Arizona's statehood. The erratic and irregular flow in the Verde River was not consistent enough in its ordinary state to support boats used for transporting commerce. A dependable and reliable draft of two feet could not be found in a stream that was sometimes only a few inches deep, although at flood stage, it could contain water well over the height of human beings. Then, however, the raging torrents of the Verde River were too dangerous to be navigated. Even the dories used by John Wesley Powell to go down the Colorado River or the rowboats used in the Wheeler expedition would have had a difficult time using the Verde River a regular basis. Furthermore, the Verde River's shifting nature made its course undependable 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 have been utilized on a regular and dependable basis on the Verde River.

CONCLUSIONS REGARDING THE VERDE RIVER

Since modern settlement began in the central Arizona area in the mid-nineteenth century, there have been a multitude of documents created describing the Verde River. These cover a wide spectrum of published and unpublished sources, including federal and state (and territorial) materials, diaries, journals, reminiscences, historical newspapers, photographs, and other archival records.

Some of the most important sources for ascertaining the nature of the Verde 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 Verde 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 Verde 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 paralleling the Verde, especially in the fertile Verde Valley, suggesting that transportation was carried out on land and not on the river.

Supporting the U.S. Government surveys' determination that the Verde River was not navigable are federal government homestead patents, U.S. grants to Arizona, and Arizona's disposition of those lands. Over 120 patents were issued by the U.S. Government Land Office to parcels of land through which the Verde 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 Verde 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 Verde 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 Verde 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 federal and state grant and patenting process is significant in relation to determining the Verde 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 Verde 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 Verde 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 Verde River was not navigable in 1912 are other published and unpublished records of the U.S. Government. Records of the U.S. Geological Survey, the Reclamation Service, and the Indian Service all described 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, newspapers, and more recent historical studies all reached the same conclusion regarding the lack of navigability of the Verde River. Indeed, the Arizona Territorial Legislature, as one of its first acts in 1865, declared that the only stream in Arizona that was navigable was the Colorado. Photographs of the Verde prior to or near the time of statehood add further evidence that the stream could hardly be considered navigable.

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

APPENDIX – LITTLEFIELD VITA

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CONSULTING AND EXPERT WITNESS EXPERIENCE:

2008-present: Research historian and consultant for McAfee & Taft in Tulsa, Oklahoma (attorney Robert Joyce). Providing historical research, written report, and testimony regarding lead and zinc mining and land use in northeastern Oklahoma for use in *Quapaw Tribe of Oklahoma, et al., v. Blue Tee Corp, et al.*, U.S. District Court for the Northern District of Oklahoma, Civil Action No. 03-CV-486-CVE-PJC.

2006-2007: Research historian and consultant for Loeb & Loeb in Los Angeles (attorney Anthony Murray). Provided historical research and deposition testimony regarding the history of natural disasters (mudslides, floods, fires, earthquakes, etc.) in Southern California for use in *Dane W. Alvis, et al., v. La Conchita Ranch Company, et al.*, Ventura County (California), Superior Court Case No. CIV 238700.

2005-present: Research historian and consultant for the Stinson Beach County Water District in Marin County, California (counsel: Hanson, Bridgett, Marcus, Vlahos & Rudy of San Francisco). Providing historical research on the history of the water rights of the District.

2005: Research historian and consultant for the Lake Arrowhead Community Services District (counsel: Best, Best & Krieger of Riverside, California). Provided historical research and documentation on the history of water rights associated with Lake Arrowhead in southern California. Testified before the California State Water Resources Control Board concerning the District's pre-1914 water rights claims (and post-1914 claims).

2004 – 2006: Research historian and consultant for City of Santa Maria, California (counsel: Best, Best & Krieger of Riverside, California). Provided 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. CIV 770214. Deposed and subsequently testified as an expert witness at trial.

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. Provided affidavit testimony.

2003 – 2004: 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 (counsel: Hanson, Bridgett, Marcus, Vlahos & Rudy of San Francisco). Provided historical research on the history of the water rights of the District.

2001 – 2007: Research historian and consultant for Paloma Investment Limited Partnership (counsel: Mesch, Clark & Rothschild of Tucson, Arizona). Provided historical research and deposition regarding whether the Gila River was commercially 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 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 on whether the Salmon River and selected tributaries were commercially 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 – 2005: Research historian and consultant for City of Las Cruces, New Mexico (counsel: Stein & Brockmann of Santa Fe, New Mexico). Provided historical research on the City's water rights for use in *State of New Mexico v. Elephant Butte Irrigation District*, Dona Ana County (New Mexico) District Court, Case No. CV 96-888.

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 – 2004: Research historian and consultant for Kern Delta Water District (counsel: McMurtrey, Hartsock & Worth of Bakersfield, California). 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. Provided 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 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 commercially navigable in 1912 when Arizona became a state. Testified between 1997 and 2005 several times 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: Simms & Stein 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 research 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. Provided affidavit testimony.

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. Deposed and later 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.

AWARDS AND OTHER PROFESSIONAL EXPERIENCE:

2008: Winner of the National Council on Public History's Consultant Award.

July 1, 2007 – present: Member, Board of Directors, California Supreme Court Historical Society.

August 2006: Faculty lecturer for Continuing Legal Education (CLE) International, Arizona Water Law Conference. Taught course on "Historians and Water Rights – The Role of Historians in U.S. Supreme Court Interstate Stream Litigation."

1999: Gave keynote address at New Mexico Water Resources Institute's 44th Annual New Mexico Water Conference on "The History of the Rio Grande Compact of 1938."

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 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 at the Pentagon and at a military base.

PUBLICATIONS:

Books:

Conflict on the Rio Grande: Water and the Law, 1879-1938. University of Oklahoma Press (2009).

The Spirit of Enterprise: A History of Pacific Enterprises, 1867-1989 (coauthor, 1990).

Articles:

"Jesse W. Carter and California Water Law: Guns, Dynamite, and Farmers: 1918-1939," *California Legal History* (2009).

"History and the Law: The Forensic Historian in Court," *California Supreme Court Historical Society Newsletter* (2008).

"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, California Supreme Court 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.