



**ASSESSMENT OF THE NAVIGABILITY
OF THE PARTS OF THE UPPER SALT
RIVER AND TONTO CREEK BETWEEN
GRANITE REEF DAM AND THE
INUNDATION LINES OF
ROOSEVELT LAKE
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 that portion of the Upper Salt River lying below the inundation lines of Theodore Roosevelt Lake (including lands along lower Tonto Creek) downstream to Granite Reef Dam on or before February 14, 1912 – the date Arizona became a State. This report does not address portions of the Upper Salt River or Tonto Creek above Theodore Roosevelt Lake. To make this evaluation, a wide array of published and unpublished documents was consulted (discussed in greater detail in the “Introduction” and listed in the Appendices). This survey of hundreds of primary and secondary sources yielded a wide spectrum of historical views of the Upper Salt River and lower Tonto Creek, from federal surveys and reports, land settlement and grant records created by the U.S. Government, federal reports, newspaper accounts, photographs, and many other records.

Taken as a whole, these records demonstrate that prior to and at the time of Arizona’s Statehood, the Upper Salt River below the inundation lines of Theodore Roosevelt Lake and that portion of Tonto Creek also under that body of water were considered not navigable by virtually every contemporaneous observer.

INTRODUCTION

As is the case with other bodies of water in Arizona, the question of ownership of the Upper Salt River's bed and that portion of Tonto Creek under Lake Roosevelt depends on what those streams were like at the time of Arizona's Statehood. In general, if any body of water such as the Salt or Tonto Creek were commercially navigable at the time of Statehood, the ownership of the bed passed to the State when it joined the Union. If any stream was not navigable, ownership of the bed remained in the U.S. Government's hands as part of the public domain until lands adjacent to and under the body of water were patented or otherwise disposed of. At that time, the bed of the stream or lake became the property of the individual land owners next to the river.¹

A. PURPOSE AND METHODOLOGY

The purpose of this report is to examine what the reach of the Salt River below the flood lines of Theodore Roosevelt Lake (including lower Tonto Creek) and above Granite Reef Dam was like at about the time of Arizona's Statehood on February 14, 1912, and to determine whether the stream prior to or on that date was considered navigable. The chronological time period covered by this report extends from the pre-Statehood era to the years shortly after Statehood. The geographic range is from the upper flood areas of Theodore Roosevelt Lake (including lower Tonto Creek) on the Salt River downstream past Roosevelt Dam to Granite Reef Dam.

A wide variety of published and unpublished sources was utilized in creating this study. The vast majority of these documents are primary sources to obtain the most accurate

¹ A number of court cases have provided some of the details on what constitutes navigability for title purposes, but the fundamental U.S. Supreme Court case is *The Steamer Daniel Ball v. United States*, 77 U.S. 999 (1871).

descriptions of the river at about the time of Statehood. To locate all relevant sources, a preliminary list of terms for searching many local, state, and national archives as well as published sources was initially developed. The list was supplemented as research brought to light new topics related to the Upper Salt River or Tonto Creek. Since individual archives have different means of listing their holdings, the list was adapted to accommodate specific locations. A lengthy list of Arizona and U.S. Government agencies' holdings were also searched for records they may have generated regarding the Upper Salt River or Tonto Creek.

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

Arizona State University was also useful for its collection of Arizona Territorial statutes. The Territorial laws were searched for legislation relevant to navigability and public land disposal. Furthermore, the library has an extensive collection of nineteenth-and early twentieth-

century Arizona newspapers such as the Arizona Gazette and the Arizona Republican. Strong advocates for settlement of the evolving community of Phoenix, the newspapers extolled the virtues of life there as well as reported on the use of the Salt River. These two papers and others were searched for articles that would provide insight to the Upper Salt River's characteristics or those of Tonto Creek.

Also useful was the University of California, Berkeley. This university is the location of the Water Resources Center Archives, and although it is located in California, this archive is one of the premier depositories for both manuscript collections and published government reports relating to water resources in the entire United States (particularly the American West). The Water Resources Center Archives contains manuscript collections of the papers of prominent civil engineers, whose work dealt extensively with irrigation, flood control, and hydroelectric power. 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 Upper Salt River) as well as all of the U.S. Reclamation Service *Annual Reports* published around the time of Arizona Statehood.

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

Following research at the Bancroft Library and the Water Resources Center Archives, reports and studies conducted by U.S. Government agencies were reviewed. Most of these reports covered such topics as flood control, irrigation, and the utilization of natural resources in the Salt River Valley. These documents provided descriptions of the Salt River at different points in time leading up to and shortly after Statehood. Some of the reports are specific to the Salt River area, but much of the information found was contained in larger studies on Arizona. In addition, a computer search was done of files compiled by Congressional Information Services (CIS) to find Congressional documents, hearings, and reports relevant to the Salt River region.

In addition to the sources obtained at Arizona State University and the University of California at Berkeley, documents held by the U.S. Bureau of Land Management in Phoenix were reviewed – records that are some of the most important documents concerning the Upper Salt River and Tonto Creek around the time of Statehood. The Bureau of Land Management holds the records of nineteenth-century U.S. General Land Office surveys carried out to prepare the public domain for homesteading, and these documents include original surveyors' plats and field notes. Since surveyors were required to "meander" (follow the sinuosities of) all navigable bodies of water and to keep detailed notes of those meanders and other aspects of their work, survey documents are vital to understand what the Upper Salt River and Tonto Creek were like at the time of survey. (See Chapter I for a more detailed discussion of how surveys were to be conducted.) The surveys are especially useful to an historical study of the characteristics of the Upper Salt River and Tonto Creek.

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 Indices. These records were used to

determine how the U.S. Government disposed of public domain lands in Arizona through which the Upper Salt River or Tonto Creek flowed. From this material, any U.S. patent that either overlaid or bordered the Upper Salt River or Tonto Creek was obtained. Federal patents were critical in determining how the U.S. Government viewed the public lands in Arizona. In theory, if federal officials had considered the Upper Salt or Tonto Creek to be navigable, they would not have deeded out land lying in the channel or beds of those streams. However, there is no indication in the multitude of federal patents overlying the Upper Salt River or Tonto Creek in the study area that the U.S. Government hesitated to grant title to the bed and the banks of those streams to patent applicants. (See Chapter II for a more detailed discussion of the significance of federal patents.)

The U.S. National Archives in Washington, D.C., provided the supporting paperwork for federal land patents such as applications and affidavits of witnesses. Federal patents and their files, combined with historical maps obtained from the U.S. Geological Survey and the U.S. Bureau of Reclamation, were used to create patent exhibit maps, which illustrate the location of all federal patents along the Upper Salt River and Tonto Creek. These maps are reproduced in Chapter II.

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.

The Salt River Project Archives in Tempe was also a critical location for research. The Project has an extensive archival collection, including many documents copied from the U.S. National Archives' Record Group 75 (U.S. Bureau of Indian Affairs) and Record Group 115

(U.S. Bureau of Reclamation). These documents relate to the Pima-Maricopa Indians and the Salt River Project, respectively. In addition to collecting documents from the U.S. National Archives, the Project also maintains an excellent collection of historical photographs of the Salt River. This collection was searched thoroughly. Furthermore, the newspaper clipping collection housed by the Salt River Project was extensive. The clippings supplemented newspaper research done at Arizona State University.

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

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

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

The two cases were especially important to the development of the Salt River Valley because they focused on dividing the river's resources among many concerned parties, and although their focus was on the portion of the Salt River below the study area, they nonetheless contained commentary about the Upper Salt.

B. ORGANIZATION OF REMAINDER OF REPORT

Based on this extensive research, it became evident that among the most important records were 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 government documents (both published and unpublished) are discussed in Chapter III along with miscellaneous historical materials. Chapter IV examines newspaper accounts and photographs of the Upper Salt River or Tonto Creek. The last section of the report contains a general summary and conclusions.

To facilitate reference throughout the main body of the report, footnotes run continuously rather than starting from number one in each chapter as is common practice in most scholarly writing. Also, the use of terms such as "ibid." has been minimized. Bibliographic appendices and the resume of Douglas R. Littlefield are attached at the end of this report.

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

Some of the most important records created in relation to the Salt River above Granite Reef Dam 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 General Land Office (today, the Bureau of Land Management). When the United States became the owner of the vast territory acquired from Mexico after the end of the Mexican War in 1848, federal officials were anxious to determine the value of what the U.S. had gained. Moreover, they wanted to prepare the region for orderly occupation by American settlers to solidify control. To ready the new lands for homesteading and to record those lands' characteristics, the United States Government undertook formal surveys by the General Land Office. Because those surveys are highly detailed, the original plats and related field notes of the region encompassing the Upper Salt River and Tonto Creek contain a wealth of information about the nature of those streams in the vicinity of Roosevelt Lake.

A. SURVEYORS' MANUALS

Due to the need for accuracy and consistency in carrying out the federal surveys, the U.S. Government issued a series of manuals to direct surveyors in their work. In many cases, surveyors specifically were instructed by their surveying contracts to use these manuals. It is important to understand the books' provisions and how they changed over time in order to recognize the manuals' significance in relation to the issue of the navigability of the Upper Salt River or Tonto Creek.

1. The 1851 *Manual*

The 1851 *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* governed how some of the earliest public land surveys were done in the American West. This *Manual* had been adopted by the General Land Office to standardize survey work in California and Oregon, which were the most significant areas of western American settlement in the late 1840s. The 1851 *Manual* was the first formal surveying handbook issued by the U.S. Government to provide guidance for surveyors mapping the vast public domain acquired from Mexico; previously, the 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 divided and subdivided into a series of ever-smaller grids-within-grids to allow the precise location of individual tracts. This system would facilitate the disposal of the public domain in an orderly fashion and at the same time record the characteristics of that land in substantial detail. The largest grids were to be six miles square and were to be created by the surveying of township and range lines. The directions in the *Instructions to the Surveyor General of Oregon* providing for the establishment of these large blocks derived from the same processes that had been used in earlier public land territories and states, procedures that had first been enacted into law in the *Land Ordinance of 1785*.³ The first surveys under this legislation had been undertaken in what is

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. In addition to providing a detailed history of those procedures, White's book also reprints many of the original surveying instructions. See C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983).

³ For details on the *Land Ordinance of 1785*, see Paul W. Gates, *History of Public Land Law Development* (Washington, D.C.: Zenger Publishing Co., Inc., 1968), pp. 59-74. Gates's seminal study of the history of public

today the State of Ohio. The grid procedure was used in most new territories added to the United States in the years that followed.

To establish township and range lines, a base line and meridian were chosen within the state or territory to be surveyed. In Arizona, the initial base line and meridian intersected at a point on a hill just south of the junction of the Salt and Gila rivers near Phoenix. That location had been chosen in 1865 by John A. Clark, Surveyor General of New Mexico Territory, to begin the Arizona surveys. (Arizona was a part of New Mexico Territory until 1863, but Clark's directions covered both territories.) Clark's beginning marker for the Arizona surveys was a point that originally had been established by the Mexican Boundary Commission in 1851 as a location 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 1871.⁴

Using the Gila and Salt River Base and Meridian to start, federal surveyors ran township and range lines in Arizona by working their way gradually north and south to create township lines and east and west to establish ranges. Each township and range line was one mile apart from the next. The one-square-mile blocks that resulted were called townships (as distinct from township lines). Surveyors numbered the townships on the basis of how far north or south and east or west of the initial base and meridian they lay. For example, the first township to the north and east of the intersection of the Gila and Salt River Base and Meridian was identified as township 1 north, range 1 east. The township directly north of that was township 2 north, range 1 east, and the township to the east of that point was township 2 north, range 2 east. All

lands was undertaken by direction of Congress (78 Stat. 982), which in 1964 created the Public Land Law Review Commission. See *ibid.*, pp. ii-iii, 807-814.

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

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 Upper Salt River from the flooded edges of Roosevelt Lake (including the lower reaches of Tonto Creek) downstream to Granite Reef Dam – the lands examined lie in townships 2 to 5 north and ranges 6 to 14 east.

The Salt River from Theodore Roosevelt Lake (including the lower portions of Tonto Creek) downstream to Granite Reef Dam can be located easily on the U.S. Geological Survey's relatively recent topographical maps of the region. Those maps are reproduced on the following pages. Going downstream, they are:

Tonto Basin, Ariz., 1964 (Tonto Creek)

Greenback Creek, Ariz., 1964 (Tonto Creek)

Meddler Wash, Arizona, Provisional Edition, 1986 (Salt River)

Windy Hill, Ariz., 1964, Photoinspected 1978 (Salt River)

Theodore Roosevelt Dam, Ariz., 1964 (Salt River and Tonto Creek)

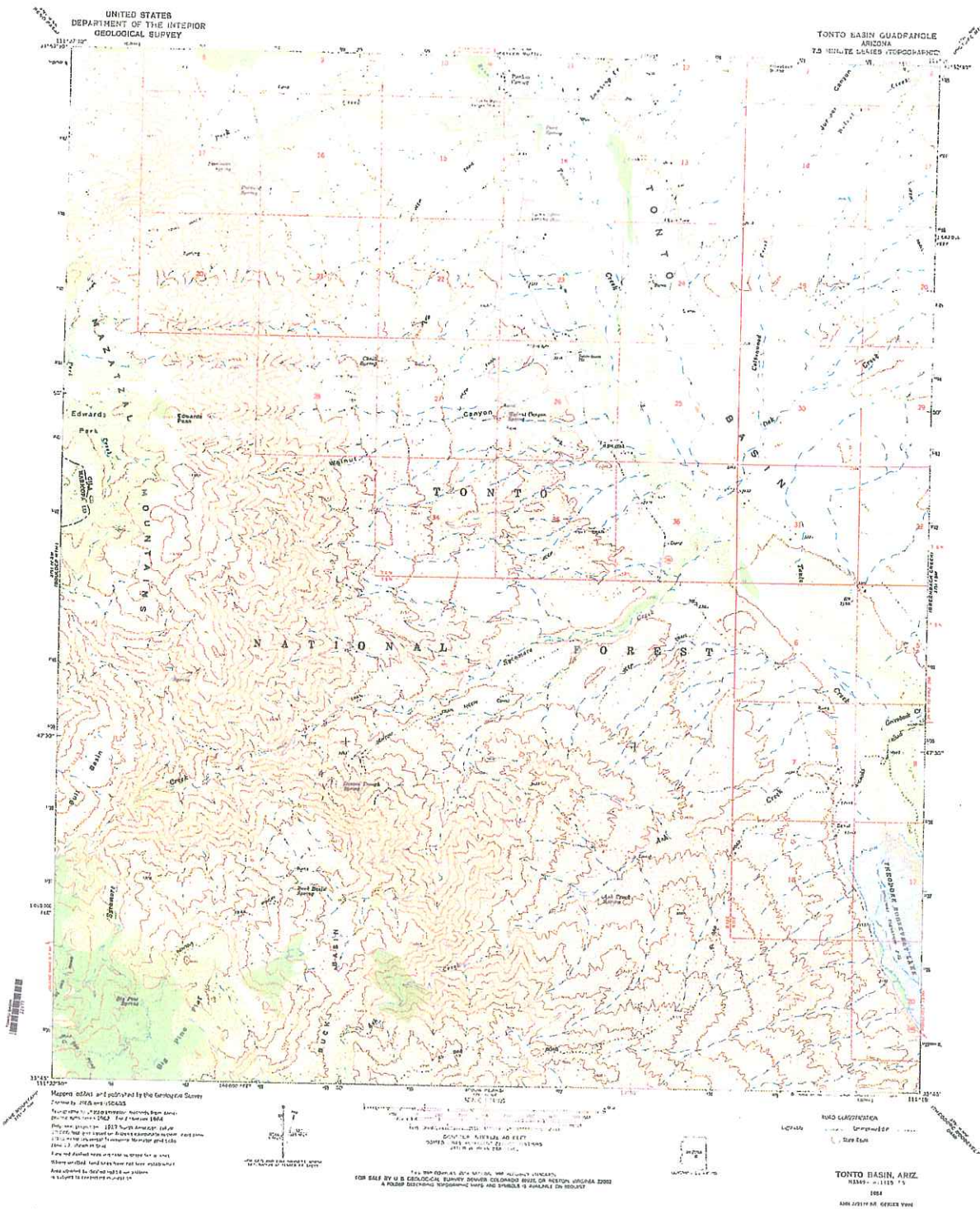
Pinyon Mountain, Ariz., 1964, Photoinspected 1978 (Salt River)

Horse Mesa Dam, Ariz., 1964, Photoinspected 1978 (Salt River)

Mormon Flat Dam, Ariz., 1964, Photoinspected 1978 (Salt River)

Stewart Mtn., Ariz., 1964, Photoinspected 1978 (Salt River)

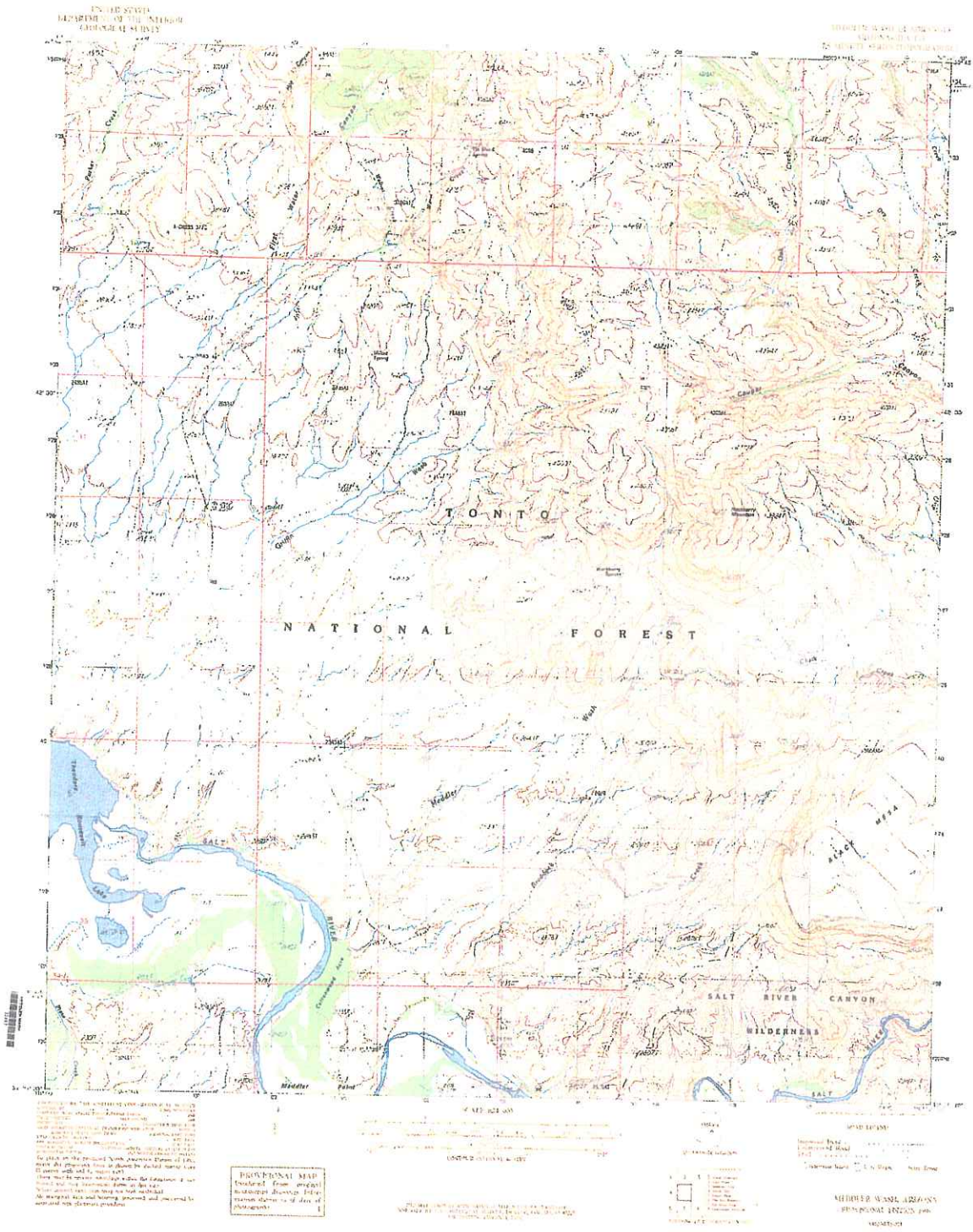
Granite Reef Dam, Ariz., 1964, Photorevised 1974 (Salt River)



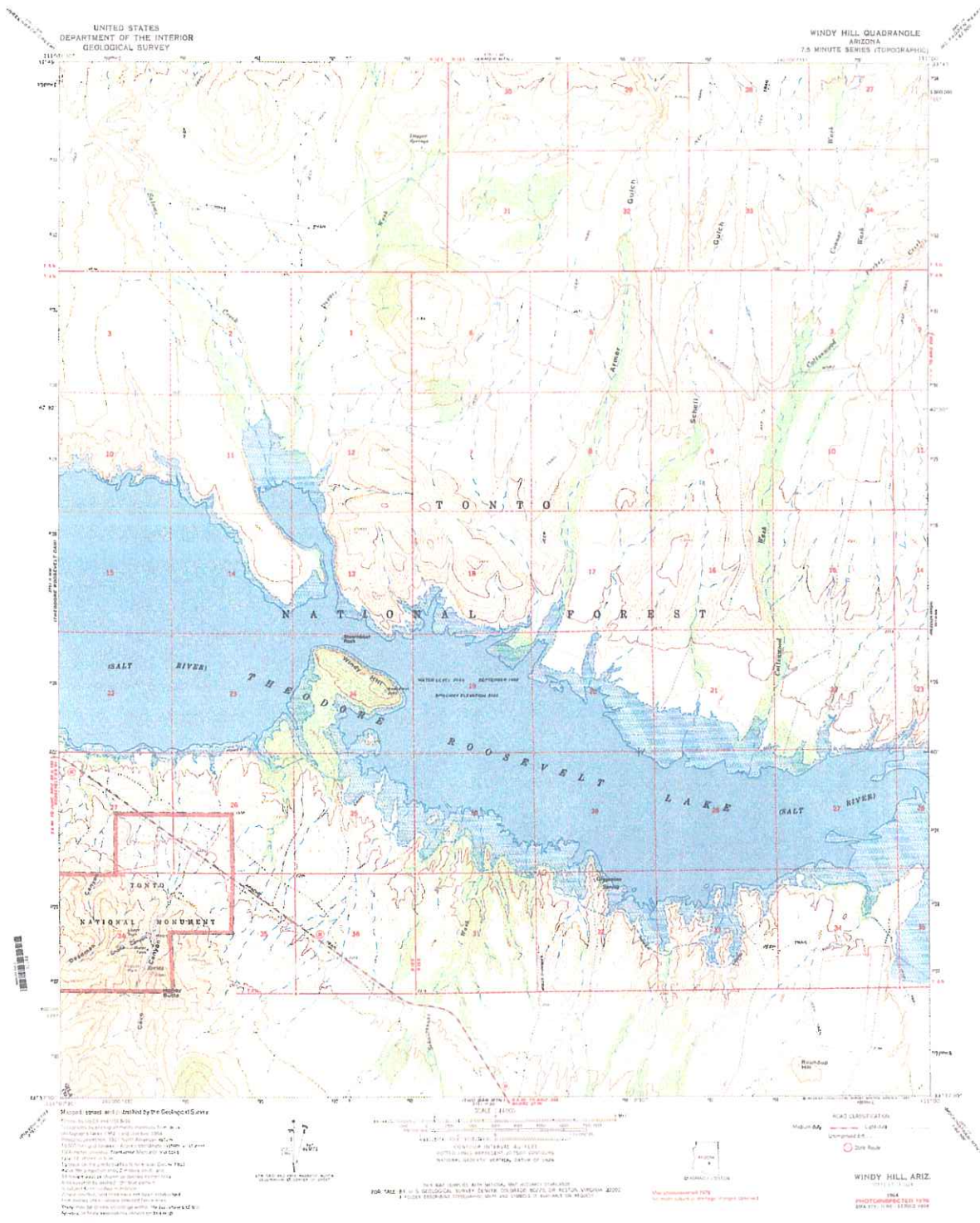
U.S. Geological Survey topo map, Tonto Basin, Ariz., 1964



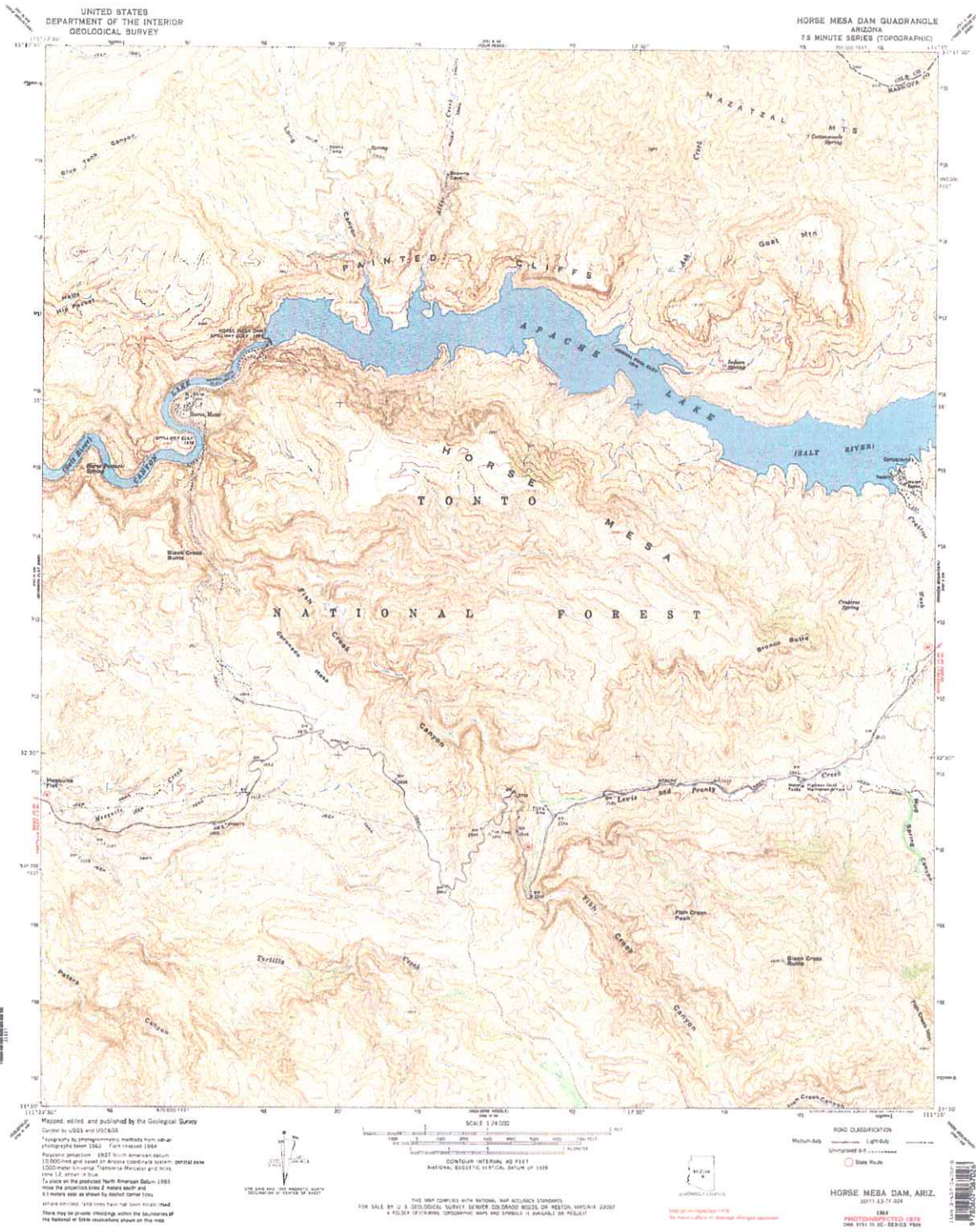
U.S. Geological Survey topo map, Greenback Creek, Ariz., 1964



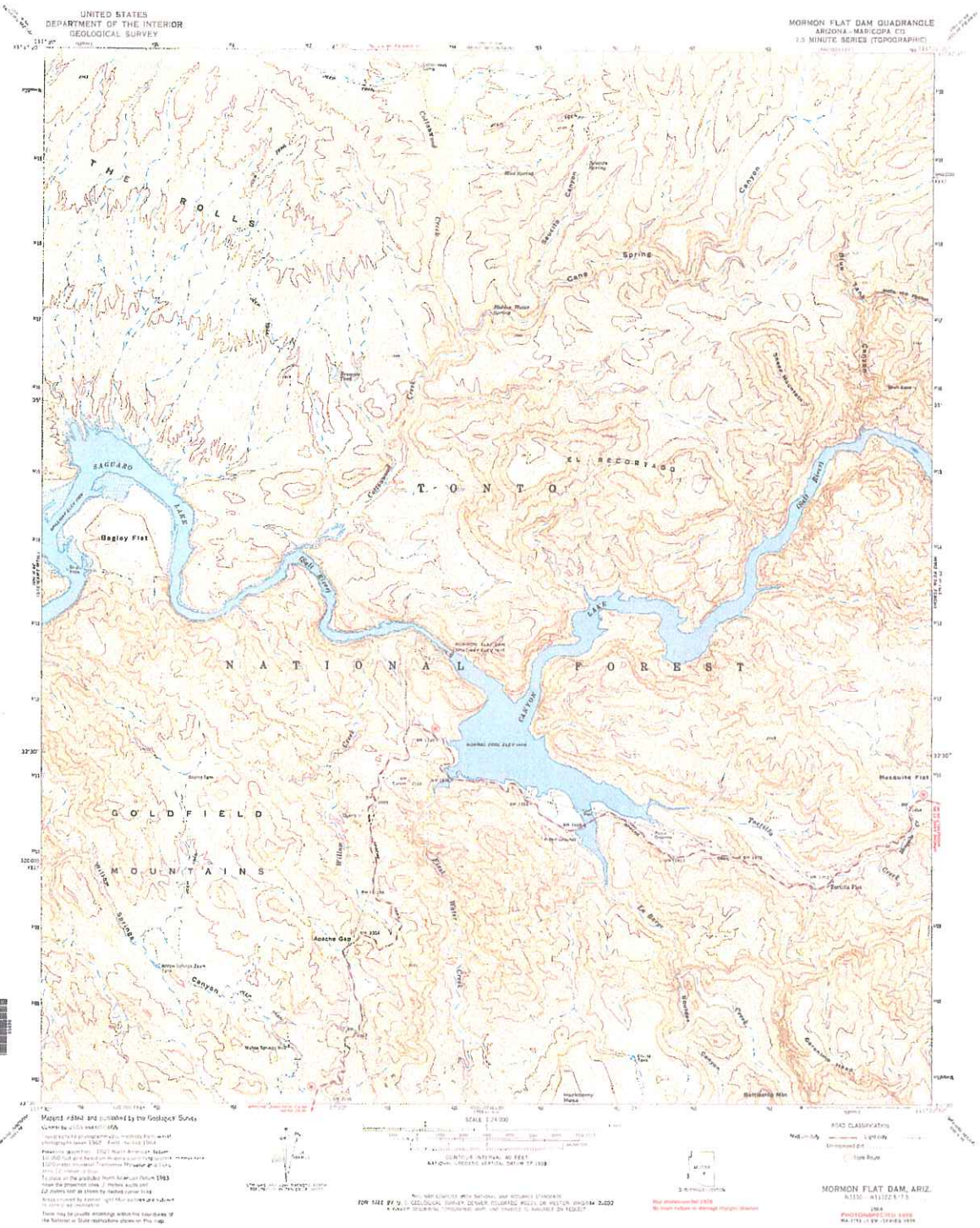
U.S. Geological Survey topo map, Meddler Wash, Arizona, Provisional Edition, 1986



U.S. Geological Survey topo map, Windy Hill, Ariz., 1964, Photoinspected 1978



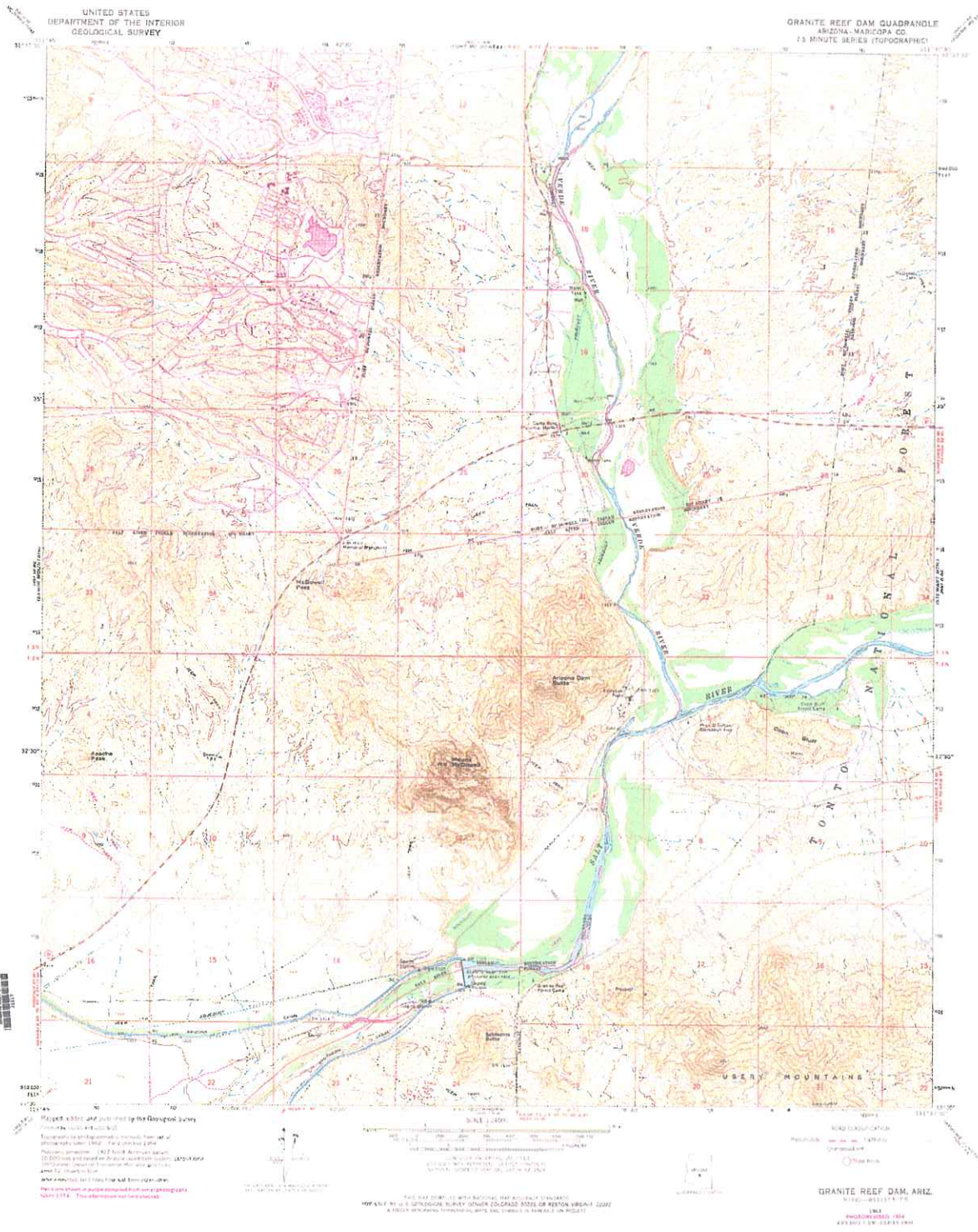
U.S. Geological Survey topo map, Horse Mesa Dam, Ariz., 1964, Photorevised 1978



U.S. Geological Survey topo map, Mormon Flat Dam, Ariz., 1964, Photoinspected 1978



U.S. Geological Survey topo map, Stewart Mtn., Ariz., 1964, Photoinspected 1978



U.S. Geological Survey topo map, Granite Reef Dam, Ariz., 1964, photorevised 1974

With exterior township and range lines established, U.S. Government 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 factors, surveyors sometimes had to adjust slightly the sections along the western and northern edges of each township to be more or less than a square mile.) The sections were numbered within each township in an “S” fashion beginning with the northeast square and heading west for sections one through six. Section seven then appeared immediately south of section six, and sections then went east through section twelve. The remaining sections were numbered in the same “S” fashion until section thirty-six was reached in the southeastern most part of the township.

Surveyors laying out the township, range, and section lines were provided with very precise instructions for measuring because accuracy was critical for these lands to be transferred out of the public domain and into private hands 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 and general topography. 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 1851 *Instructions to the Surveyor General of Oregon* contained several provisions that are relevant to navigable bodies of water and therefore are important in relation to any consideration of the navigability of the Upper Salt River or Tonto Creek. 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 directions continued with regard to navigable bodies of water,

at the intersection of lines with both margins of impassable obstacles, you will establish a Witness Point, (for the purpose of perpetuating the intersections therewith) by setting a post, and giving in your field book the course and distance therefrom, to two trees on opposite sides of the line, each of which trees you will mark with a blaze and notch facing the post; but on the margins of navigable water courses, or navigable lakes, you will mark the trees with the proper number of the fractional section, township, and range.⁵

The *Instructions to the Surveyor General of Oregon* also provided that when surveyors encountered navigable bodies of water, special survey markers called “meander corner posts” were to be “planted at all those points where the township or section lines intersect the banks of such rivers, bayous, lakes, or islands, as are by law directed to be meandered.”⁶ (Congress first passed legislation establishing that navigable waterways remain public highways in 1796 – a statute that led to the requirement that navigable rivers and lakes be meandered by federal surveyors – but that law did not specify what constituted navigability.)⁷ Therefore, where township, range, section, or fractional section lines encountered bodies of water, witness posts were to be established if those watercourses were not navigable, but meander corner posts were

⁵ *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* (1851), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 438.

⁶ *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* (1851), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 439. On the federal legislation mandating meanders of navigable bodies of water, see White, *A History of the Rectangular Survey System*, p. 30.

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

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

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

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

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

Aside from these general directions, surveyors also were given precise instructions for measuring the sinuosities of navigable bodies of water, including rivers, streams, lakes, ponds, or bayous. Between the meander corner posts, the edges of the banks were to be measured going downstream by recording degree bearings. The details of this meander surveying were to be recorded in the surveyor’s field book as a separate set of records from the surveys of township, range, and section lines.⁹

Finally, as if these instructions were not specific enough, the 1851 *Instructions to the Surveyor General of Oregon* contained detailed examples of surveying notes so that field surveyors would understand virtually any type of circumstance they might encounter.¹⁰

2. The 1855 Manual

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

⁸ *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* (1851), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 444.

⁹ *Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations* (1851), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 442.

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

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) contained more detail than the 1851 instructions. Nevertheless, it remained virtually identical in substance with regard to recording navigable and non-navigable bodies of water.¹¹

3. The 1864 Instructions

Nine years after the 1855 *Manual* had appeared, the U.S. General Land Office began to modify its instructions for how surveyors dealt with navigable and non-navigable bodies of water. In 1864, the 1855 surveyors' *Manual* was amended by *Instructions to the Surveyors General of the United States, Relating to Their Duties and to the Field Operations of Deputy Surveyors*. Because surveys in Arizona began in 1868, it was this set of directions that governed how bodies of water in Arizona Territory were recorded.

The 1864 revision made no changes to the section of the 1855 *Manual* that dealt with “insuperable objects on line.” In fact, the 1864 amendments did not discuss these directions 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 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.

The 1864 *Instructions* added that for the sake of consistency, one-bank meanders were to be run 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 at a point where a survey line crossed the stream and was to be 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 directions remained the same as in the 1855 *Manual* as amended in 1864, including, for example, how surveyors were to establish witness posts at intersections with non-navigable “insuperable objects on line.” Here, as in 1851 and 1855, the manual told surveyors to use triangulation to establish the distance across non-navigable obstacles on line. Also as in the 1851 and 1855 books, surveyors were to set a witness post on the line on each side of obstacle, and they were to measure to two trees on opposite sides of the line for each post. Each tree was to be marked with a notch and blaze facing the post, and the degree bearing and distance from the trees to their respective witness posts on line were to be noted in the field notes.¹³

For navigable bodies of water, as had been the case in the 1851 and 1855 *Manuals* (as amended in 1864), the surveyors were told that “on the margins of navigable water-courses, or navigable lakes, you will mark the trees with the proper number of the fractional section,

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.

township and range.” And similar to the 1851 and 1855 instructions, the 1881 directions provided that “[m]eander corners are established at all those points where the lines of the public 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 *Instructions* 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 indistinguishable from the previous work, including those directions for recording major obstacles. For example, the 1890 instructions about how to chronicle “insuperable objects on line” continued to provide that surveyors were to use triangulation to measure across the obstruction. Surveyors also were still instructed to set a witness post on line at the edge of the non-navigable obstacle and to give the course and direction to two nearby trees on opposite sides of the line, each of which were to be notched and marked with a blaze facing the witness post. And, as had been the case in the 1855, 1864, and

¹⁴ *Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims* (1881), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 516-517.

¹⁵ *Instructions of the Commissioner of the General Land Office to the Surveyors General of the United States Relative to the Survey of the Public Lands and Private Claims* (1881), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), pp. 523-524.

1881 directives, 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 *Instructions* had provided “under the statute.” Instead, the 1890 *Manual* stated:

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

In short, there had been two significant changes regarding what bodies of water should be meandered. The first was that meanders were to be done of waterways “as are by law directed to be meandered” (1881) or “embraced in the class denominated as ‘navigable’” (1890). The second change as to what was to be meandered involved non-navigable streams. This modification involved bodies of water used for “internal communication” (1881), where one

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. In surveying, one chain equals 100 links or 66 feet.

bank was to be meandered, or streams more than three chains wide, where both banks were to be meandered (1890).

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 another instruction. Both navigable and non-navigable streams (more than three chains wide) were to be meandered “at the ordinary *mean high water mark*” (emphasis in original), and their general courses and sinuosities were to be recorded in the appropriate field notebook. Furthermore, in another significant change, the *1894 Manual* provided that “[s]hallow streams, without any well-defined channel or permanent banks *will not be meandered*; except tide-water steams, whether more or less than three chains wide, which should be meandered at ordinary high-water mark, as far as tide-water extends.” (Emphasis in original.)¹⁸

7. **The 1902 Manual**

Shortly after the turn of the century, the U.S. General Land Office once again revised its surveying handbook, releasing *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* on January 1, 1902. There were significant

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.

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 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 1902 *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 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

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.

The 1902 *Manual* also retained the instruction that shallow streams “without any well-defined channel or permanent banks, will not be meandered; except tide-water streams, whether more or less than three chains wide, which should be meandered at ordinary high-water mark, as far as tide-water extends.”²¹

B. SUMMARY AND CONCLUSIONS REGARDING SURVEYORS’ MANUALS AND MEANDERING

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

C. U.S. GOVERNMENT ORIGINAL SURVEYS OF LANDS ALONG THE UPPER SALT RIVER

Prior to Arizona’s Statehood in 1912, areas along the Upper Salt River and Tonto Creek in the Roosevelt Lake area were surveyed, both in relation to exterior township and range lines as well as for interior section and subsection lines. Because surveyors whose work involved marking only exterior lines did not have the responsibility to undertake meanders where necessary, the field notes of those surveys are of limited value to this report and therefore will not be discussed here. Instead, the field notes of interior surveys and resulting plats will be

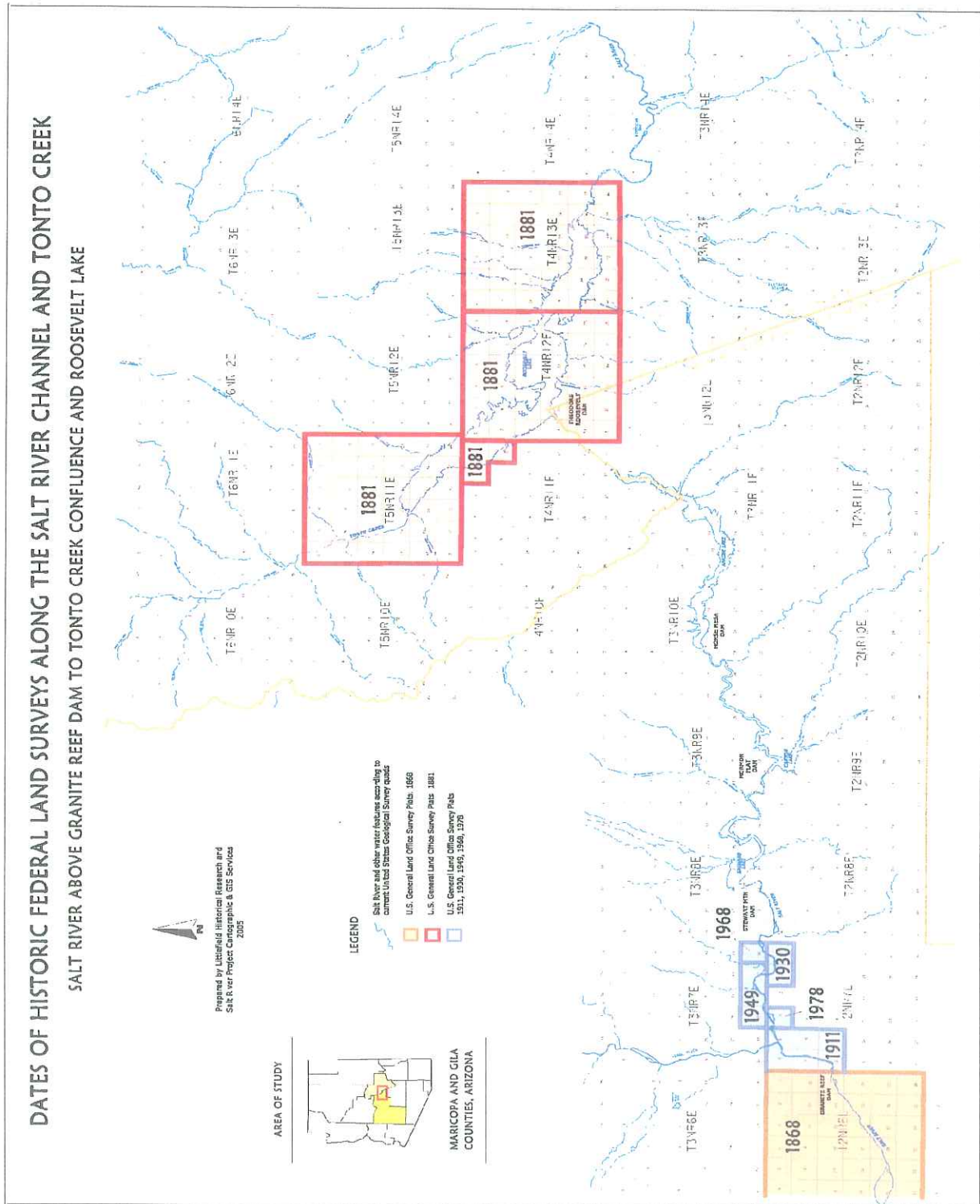
²¹ *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* (1902), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 718.

examined in detail for information regarding those surveyors' judgments and descriptions regarding the navigability of the Upper Salt River and Tonto Creek.

Before Arizona's Statehood in 1912, the interiors of the townships (or parts of those townships) through which the Salt River flows between the upper limits of Roosevelt Lake's inundation area (including lower Tonto Creek) and Granite Reef Dam were surveyed by federal surveyors in 1868 (the area around Granite Reef Dam), 1881 (lands later inundated by Theodore Roosevelt Lake), and 1911 (area near the confluence of the Verde and Salt Rivers). In addition, lands along the Salt River between the Verde River and the present location of Stewart Mountain Dam were surveyed after Statehood in 1930, 1949, 1968, and 1978. A major reach of the Salt River above these last locations and below Roosevelt Dam was never surveyed by the General Land Office (or its successor, the Bureau of Land Management) because these lands were located in national forests, Indian reservations, or contained lands withdrawn from the public domain for various purposes such as for the Salt River Project. (See the map below for the locations and dates of federal surveys of townships along the Upper Salt River and Tonto Creek.)

DATES OF HISTORIC FEDERAL LAND SURVEYS ALONG THE SALT RIVER CHANNEL AND TONTO CREEK

SALT RIVER ABOVE GRANITE REEF DAM TO TONTO CREEK CONFLUENCE AND ROOSEVELT LAKE



Map Showing Dates of Federal Surveys along the Upper Salt River above Granite Reef Dam and Tonto Creek in the Roosevelt Lake Area, Littlefield Historical Research and Salt River Cartographics & GIS Services, 2005

In the area now covered by Roosevelt Lake, the pre-Statehood surveys were carried out in 1881 under the terms of the 1881 *Instructions* or the 1890 *Manual* (depending on how quickly the provisions of the 1881 *Instructions* were disseminated to surveyors in the field – those instructions were released in May of that year). Assuming the 1881 *Instructions* controlled the survey in this region, the surveyor who undertook those 1881 surveys (Theodore S. White) carried out his work under the directive to meander both banks of those streams that were navigable as well as to meander “well-defined natural arteries of internal communication” on one bank only.²² If the 1890 survey book had directed his work, White would have been governed by the directions 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.”²³

With regard to the 1911 partial survey of the Salt River just above Granite Reef Dam near the Salt’s confluence with the Verde, that work would have been governed by the 1902 directions which specified that surveyors needed to be careful in distinguishing between meanders for navigability purposes and other irregular boundaries such as borders of Indian reservations. With regard to navigability, the 1902 directions would have required the 1911

²² *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.

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.

surveyor to meander both banks of the Salt River if the stream were navigable or if it was more than three chains wide.²⁴

Because of the importance of these initial federal surveys in relation to establishing the nature of the Upper Salt River or Tonto Creek, they will be discussed in detail here. In general, the discussion will be in a down-river manner. Within individual townships, discussion will also be downriver by the location on the survey where it crossed the Salt River or Tonto Creek.

1. 1881 Subdivision Survey of Township 4 North, Range 13 East

The most upstream portion of the Salt River in the flooded area of present-day Theodore Roosevelt Lake lies in township 4 north, range 13 east. The interior subdivision lines of this township were surveyed in late April and early May 1881 by Deputy Surveyor Theodore S. White under his contract dated August 27, 1880. The survey and the related plat (see below) were approved by the Surveyor General on December 14, 1881.

At each crossing of the Salt River in this township, Deputy Surveyor White noted that he measured across the stream and set survey posts on both banks. Observing that the Salt was between one and three chains wide (and in some instances divided into channels), at one crossing White noted that the water was shallow. In the general description of the township at the end of his survey notes, White stated that there were several farmers along the stream. With regard to navigability, however, White set no meander corners in this township, and he did not undertake any meanders of the stream.²⁵

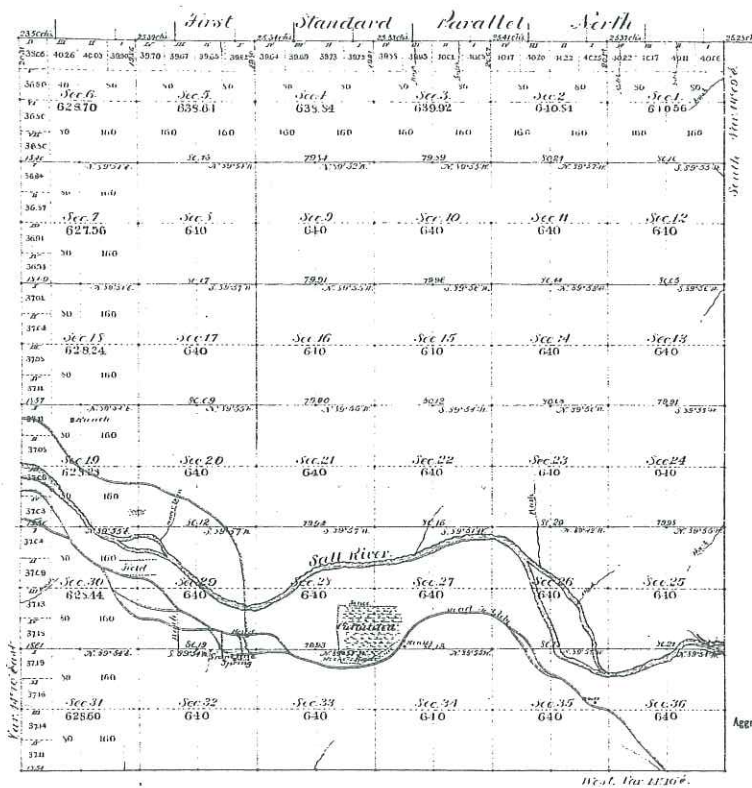
²⁴ *Manual of Surveying Instructions for the Survey of the Public Lands of the United States and Private Land Claims* (1902), reprinted in C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: U.S. Department of the Interior, 1983), p. 718.

²⁵ Theodore S. White, Field Notes of the Survey of the Subdivision Lines of Township 4 North, Range 13 East, Gila and Salt River Base and Meridian, Arizona, approved by the Surveyor General Dec. 14, 1881, pp. 40-41, 69, U.S. Bureau of Land Management, Phoenix, Arizona; White, Plat of Township 4 North, Range 13 East, Gila and Salt River Meridian, approved by the Surveyor General Dec. 14, 1881, *ibid.*

TOWNSHIP NO. 4 NORTH RANGE NO. 13 EAST GILA AND SALT RIVER MERIDIAN.

800185

OFFICIALLY FILED 3-2-1882



Aggregate Area of Public Land Surveyed 22,968.624.

Subdivision lines run at a variation of 10°30' East.

SURVEYS DESIGNATED BY WHOM SURVEYED		DATE OF CONTRACT	AMOUNT OF SURVEY	AREA SURVEYED
SEC.	ACRES		MI. CH.	SECT.
Thompson	1	Aug. 27 1880	17 78 55	April 26 36 1881
Subdivision	2	"	59 73 95	"
Connecting	"	"	1 36 51	"

The above plat is Township No. 4 North Range No. 13 East Gila and Salt River Meridian Arizona, is strictly conformable to the field notes of survey thereon on file in this Office which have been examined and approved.

Surveyor General's Office

Tucson, Arizona December 14, 1881

J. H. ... Surveyor General

U.S. General Land Office Survey Plat of Township 4 North, Range 13 East (1881), U.S. Bureau of Land Management, Phoenix, Arizona

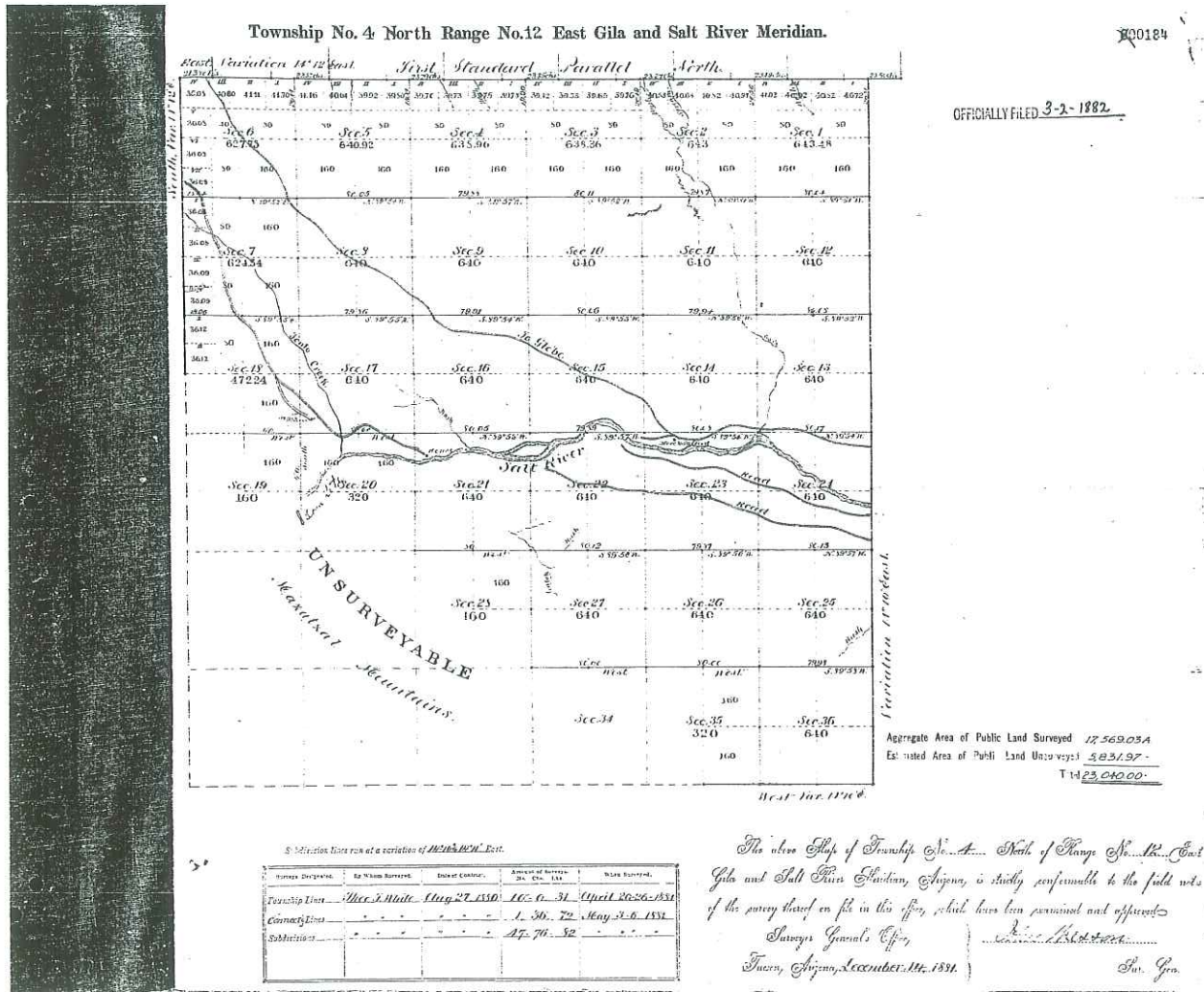
2. 1881 Subdivision Survey of Township 4 North, Range 12 East

This township, which was also surveyed by Deputy Surveyor Theodore S. White in the spring of 1881, encompasses lands that were flooded by Theodore Roosevelt Lake along both the Salt River as well as Tonto Creek. The Salt River portion of the township will be discussed first followed by areas along Tonto Creek.

As he had done in his survey of township 4 north, range 13 east, Deputy Surveyor White set no meander corners and performed no meanders along the banks of the Salt River in this

township (see below for the plat of this township). His field notes of the survey of township 4 north, range 12 east, also indicated that like the township next upstream, the Salt River in this township was about two chains wide. Moreover, White again observed that the Salt was “shallow” in several locations where he surveyed across the stream. White’s surveys across Tonto Creek in this township also indicated no meanders, and White observed that the stream was only about a hundred links wide.²⁶

²⁶ Theodore S. White, Field Notes of the Survey of the Subdivision Lines of Township 4 North, Range 12 East, Gila and Salt River Base and Meridian, Arizona, approved by the Surveyor General Dec. 14, 1881, pp. 39-40, 41-42, 58-63, U.S. Bureau of Land Management, Phoenix, Arizona; White, Plat of Township 4 North, Range 12 East, Gila and Salt River Meridian, approved by the Surveyor General Dec. 14, 1881, *ibid.*

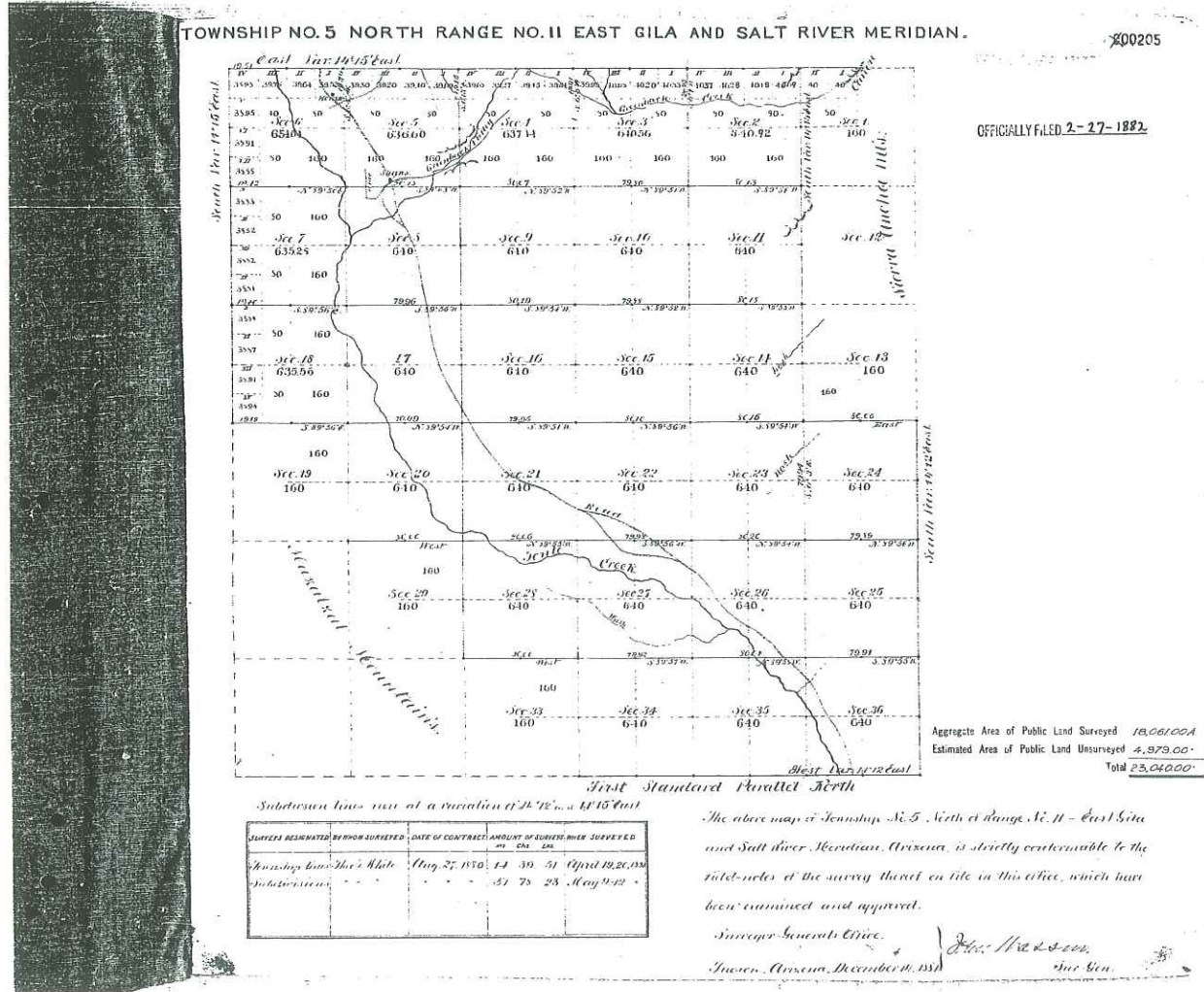


U.S. General Land Office Survey Plat of Township 4 North, Range 12 East (1881), U.S. Bureau of Land Management, Phoenix, Arizona

3. 1881 Subdivision Survey of Township 5 North, Range 11 East

At the upper most end of the submerged part of Tonto Creek under Theodore Roosevelt Lake is township 5 north, range 11 east. This township was surveyed by Theodore White in mid-May 1881, and his survey of the township was approved by the Surveyor General on December 14, 1881. The field notes of township 5 north, range 11 east, indicate that Tonto Creek was between 40 and 100 links wide, depending on where in the township White crossed the stream. White's plat (see below) indicated that Tonto Creek coursed from the north toward

the southwest across the township. He further noted the existence of a road paralleling the stream, suggesting that Tonto Creek was not useful for transportation.²⁷



U.S. General Land Office Survey Plat of Township 5 North, Range 11 East (1881), U.S. Bureau of Land Management, Phoenix, Arizona

²⁷ Theodore S. White, Field Notes of the Survey of the Subdivision Lines of Township 5 North, Range 11 East, Gila and Salt River Base and Meridian, Arizona, approved by the Surveyor General Dec. 14, 1881, pp. 2, 8-10, 19-21, 30-32, 40-44, 45-47, 49-50, U.S. Bureau of Land Management, Phoenix, Arizona; White, Plat of Township 5 North, Range 11 East, Gila and Salt River Meridian, approved by the Surveyor General Dec. 14, 1881, *ibid*.

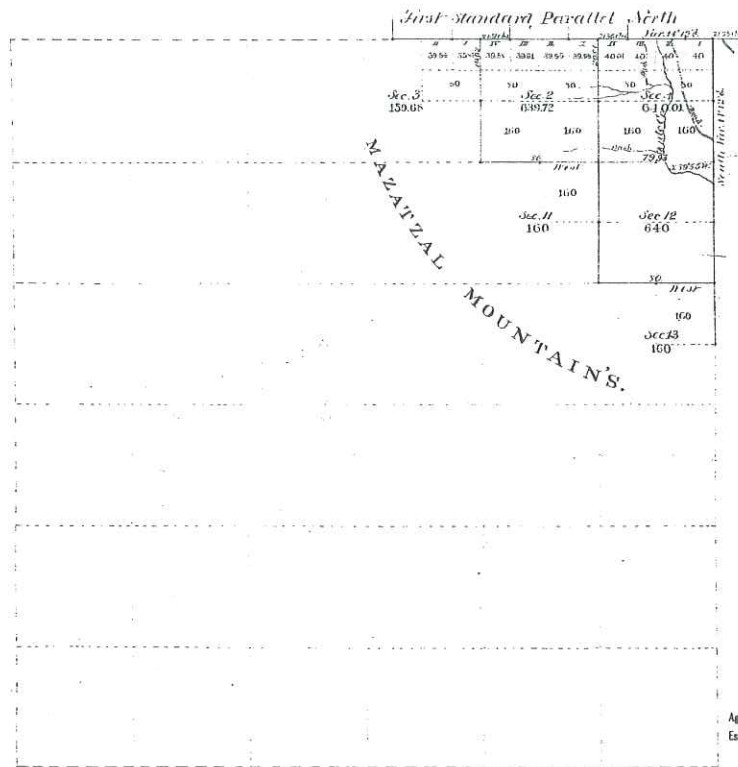
4. 1881 Partial Subdivision Survey of Township 4 North, Range 11 East

Also under Theodore Roosevelt Lake are portions of Tonto Creek in township 4 north, range 11 east. In this township, Tonto Creek crosses section lines between sections 1 and 12. Theodore White undertook a partial survey of this township (the plat for which appears below) in 1881 at about the same a time that he surveyed other areas under present-day Theodore Roosevelt Lake. It was only the area along Tonto Creek that he surveyed in this township, deeming other parts of the township as being “rocky and barren & utterly worthless.” White did not meander Tonto Creek in this township, and also attesting to the small size of Tonto Creek and its lack of navigability is the plat of this township showing a road paralleling the stream immediately to the east.²⁸ Presumably transportation took place along the road due to Tonto Creek’s inability to support navigation.

²⁸ Theodore S. White, Field Notes of the Survey of the Subdivision Lines of Township 4 North, Range 11, East, Gila and Salt River Base and Meridian, Arizona, approved by the Surveyor General, Dec. 14, 1881, p. 1, U.S. Bureau of Land Management, Phoenix, Arizona; White, Plat of Township 4 North, Range 11 East, Gila and Salt River Meridian, approved by the Surveyor General Dec. 14, 1881, *ibid*.

Township No. 4 North Range No. 11 East Gila and Salt River Meridian.

800183



3. Meridian line on the east side of 24.12" E. 1/2".

Section	By Call	Surveyed	Area of Survey	Time
Section 1	Thos. J. White	Aug. 27, 1880	2 40.0	April 20, 1881
Section 2			0 42.67	May 7, 1881
Section 3			5 79.60	May 7, 1881

The true copy of Township No. 4 North of Range No. 11 East Gila and Salt River Meridian, Arizona is hereby confirmed to the field site of the survey shown on file in this office, which has been examined and approved by me.

James H. Powell, U.S. Surveyor General, Arizona
 Tucson, Arizona, December 24, 1881.

U.S. General Land Office Survey Plat of Part of Township 4 North, Range 11 East (1881), U.S. Bureau of Land Management, Phoenix, Arizona

5. Surveys of areas downstream from Township 4 North, Range 11 East

The records of the surveys of the interiors of townships downstream on the Salt River between township 4 north, range 11 east, and Granite Reef Dam do not contain subdivision details that are relevant to this report. As noted above in this chapter, some of these regions were not surveyed before Arizona became a State in 1912. Other townships in this reach of the Salt River were never surveyed at all due to their rugged terrain or their inclusion in national forests, Indian reservations, or lands withdrawn for the Salt River Project. It should be noted, however,

that meanders were done of the right bank (going downstream) of the Salt River in townships 2 and 3 north, range 7 east as part of those townships' exterior boundary surveys in 1887 and a resurvey in 1911 of the boundaries of township 2 north, range 7 east (which also included the northwest corner of the interior of that township). Those meanders, however, were conducted because the Salt River in those townships forms the southern boundary of the Salt River Indian Reservation (and hence, was the northern edge of the public domain in those townships), not because the Salt River was navigable.²⁹

Also, although Granite Reef Dam lies in section 13 of township 2 north, range 6 east, near that township's eastern boundary and no interior section lines cross the Salt River upstream from that point in that township, it should also be pointed out that meanders of that township were done on the right bank of that stream during the 1911 resurvey due to the presence of the Salt River Indian Reservation. Confirming that those meanders were due to the Salt River Indian Reservation's boundary, the original survey of the interior of that township done by G.P. Ingalls in 1868 contained no meander data.³⁰

²⁹ L.D. Chillson, Plat of Exterior Boundaries of Township 2 North, Range 7 East, Gila and Salt River Meridian, approved by the Surveyor General July 11, 1887, U.S. Bureau of Land Management, Phoenix, Arizona; L.D. Chillson, Plat of Exterior Boundaries of Township 3 North, Range 7 East, Gila and Salt River Meridian, approved by the Surveyor General July 11, 1887, *ibid.*; R.A. Farmer, Field Notes of the Survey of the Subdivision of Township 2 North, Range 7 East, Salt River Indian Reservation, Jan. 1911, approved by the Surveyor General March 29, 1913, *ibid.*; R.A. Farmer, Resurvey Plat of Exterior Boundaries of Township 2 North, Range 7 East, Gila and Salt River Meridian, approved by the Surveyor General March 29, 1913, *ibid.* [resurvey was conducted in 1911].

³⁰ G.P. Ingalls, Plat of Township 2 North, Range 6 East, Gila and Salt River Meridian, approved by the Surveyor General Dec. 31, 1868, U.S. Bureau of Land Management, Phoenix, Arizona; L.D. Chillson, Plat of Exterior Boundaries of Township 2 North, Range 6 East, Gila and Salt River Meridian, approved by the Surveyor General July 11, 1887, *ibid.*

D. SUMMARY AND CONCLUSIONS REGARDING U.S. GOVERNMENT SURVEYS ALONG THE UPPER SALT RIVER

U.S. Government surveyors were specifically charged with the task of identifying navigable streams as part of their surveying duties, and the manuals and instructions under which they carried out their work were very precise about how navigable bodies of water were to be distinguished from non-navigable ones. Significantly, surveys undertaken for the Upper Salt River above Granite Reef Dam and Tonto Creek and below the inundation lines of Theodore Roosevelt Lake gave no indication that the federal surveyors in charge of that work believed either stream to be navigable.

CHAPTER II: FEDERAL PATENTS

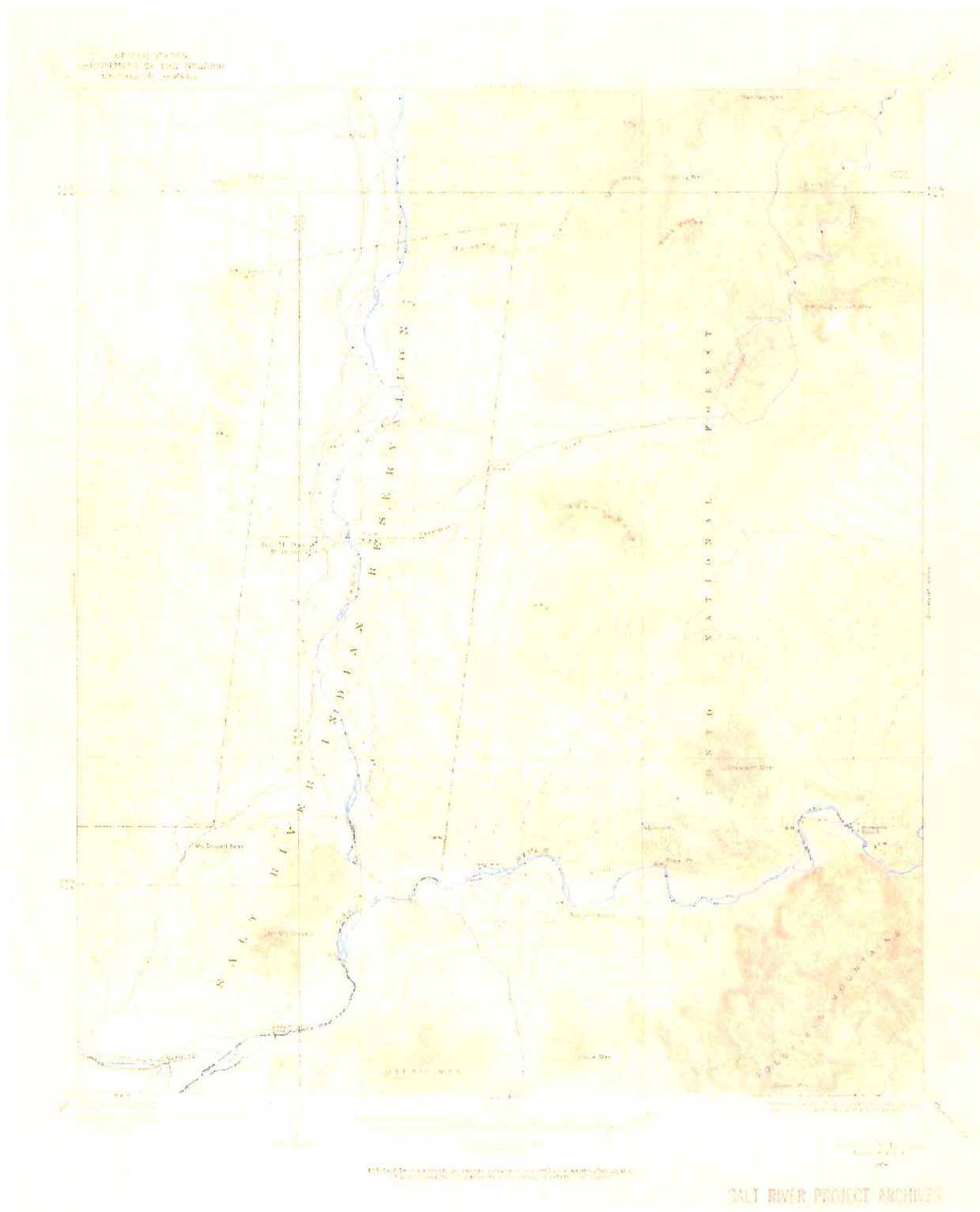
The U.S. Congress passed a variety of homestead statutes in the middle-to-late nineteenth century designed to facilitate the settlement of newly acquired lands in the American West. Those laws resulted in thousands of federal patents (legal title, or deeds) being issued to settlers determined to establish homes and farms in the West's unfamiliar climate. Before discussing U.S. Government land patents in relation to the Upper Salt River and Tonto Creek and the patents' significance to the issue of navigability, a few words need to be said about those streams' locations as portrayed on various maps because the waterways' positions – which are shown on those maps – are significant in relation to patent sites that will be reviewed.

A. U.S. HISTORICAL MAPS OF THE UPPER SALT RIVER REGION

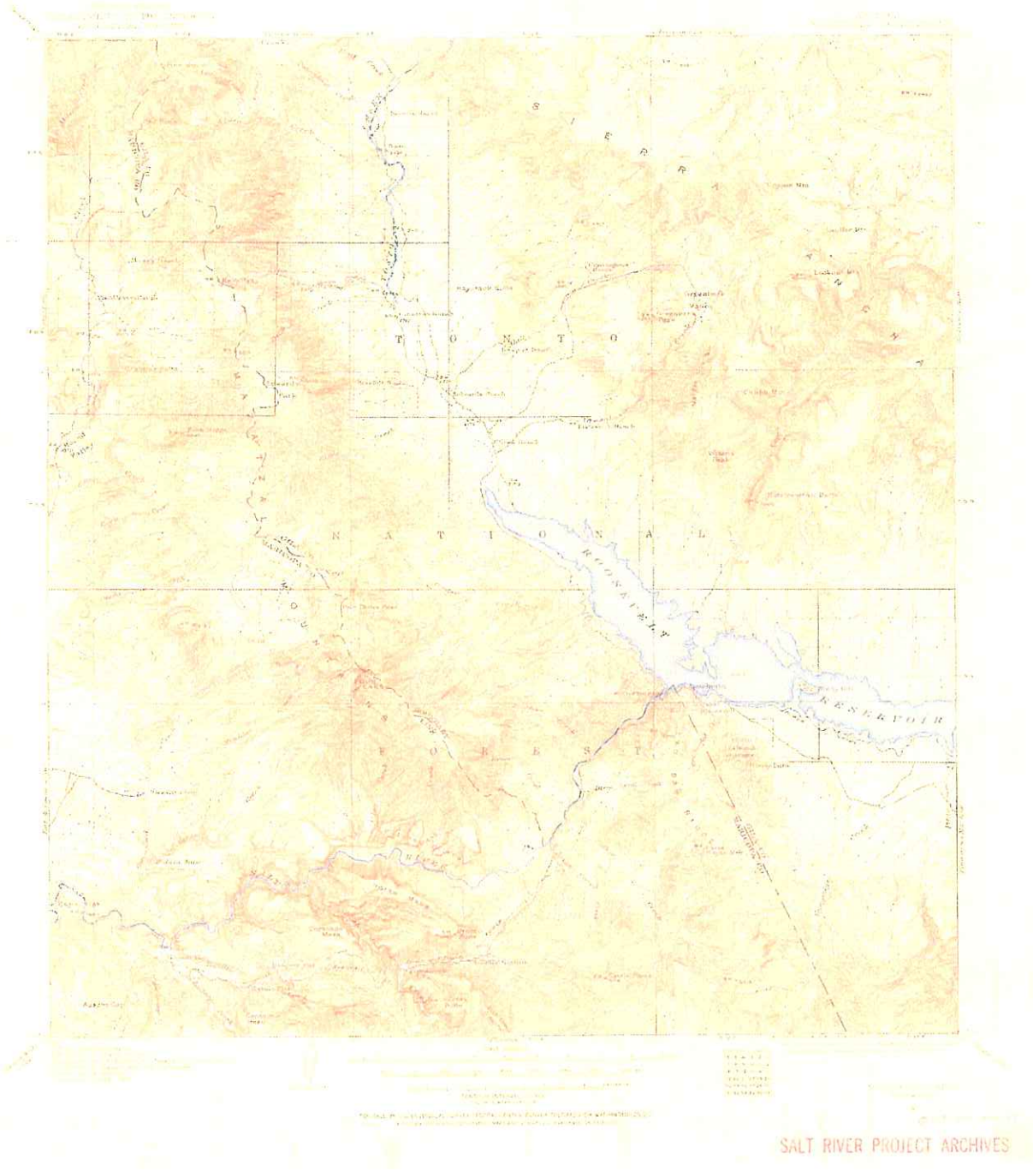
As noted in Chapter I, the U.S. General Land Office (and its successor, the Bureau of Land Management) conducted original surveys in the Upper Salt River area and along lower Tonto Creek in the late nineteenth and early twentieth centuries to facilitate homesteading and to create accurate legal descriptions of the region. The survey plats covering the study area of this report that date to the years before Statehood include plats drawn in 1) 1881 – nearly all the lands now flooded by Theodore Roosevelt Lake, and 2) 1868 and 1911 – lands around Granite Reef Dam. (For details on the dates and locations of these General Land Office surveys, see the survey location map in Chapter I. The plats themselves are also reproduced in Chapter I.) These plats were used (together with other maps discussed below) to locate the positions of federal patents near or containing the Upper Salt River or Tonto Creek.

In addition to maps drawn by the General Land Office, the U.S. Geological Survey also became active in mapping the Upper Salt area around the early twentieth century in part due to

the development of plans for the Salt River Project. That cartographic activity resulted in the Geological Survey's 1904 topographic map covering the area around Granite Reef Dam and the confluence of the Verde River with the Salt entitled "Ft. McDowell, Ariz." and the 1907 topographic map of the Theodore Roosevelt Lake area, named, appropriately, "Roosevelt, Ariz." (See the following pages for those two maps.)



U.S. Geological Survey topo map, Ft. McDowell, Ariz., 1904



U.S. Geological Survey topo map, Roosevelt, Ariz., 1907

In addition, in the early twentieth century, the Geological Survey produced a series of hand-drawn plats of lands in the Upper Salt River area (and related tables of data) in preparation

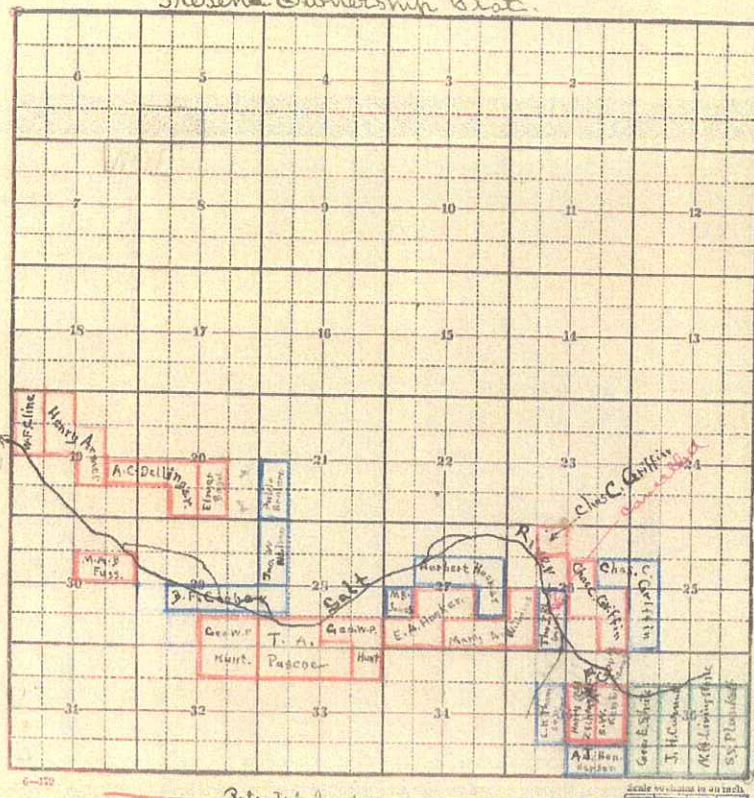
for constructing the Salt River Project. These maps, which were drawn in 1903 and 1904, were not based on formal surveys but were sketches intended to help the Government determine land ownership and occupancy for payments for areas to be submerged by Theodore Roosevelt Lake. Despite their lack of formal survey data, the maps nonetheless indicate the location of the Upper Salt River and Tonto Creek as they passed through parcels that would later be under the reservoir's water. There are four Geological Survey sketch maps that cover the lands along the Salt River or Tonto Creek that were subsequently flooded by Theodore Roosevelt Lake. These maps include sketches indicating ownership and occupancy in township 4 north, ranges 11, 12, and 13 east, and township 5 north, range 11 east.

On each map (which are reproduced below), parcels that are outlined in red are lands that had been patented at the time the maps were drawn; lands outlined in blue had been entered, but title to the patents had not been perfected. Some of these maps also show the water levels that would have been reached by a reservoir proposed in the 1890s for the same location by the Hudson Reservoir Company. It should be noted here that these maps show ownership or entry as of 1903-1904; some parcels had changed hands since the time of original entries or patents.

The Geological Survey's land ownership sketch map series subsequently was combined in 1904 into one map showing all parcel ownerships and indicating minor corrections from the original sketch maps. (This latter map, which is reproduced following the Geological Survey's sketch maps, has been "stretched" for better legibility.)

Township No. 4 North Range No. 13 E G. & S. R. Mer.
 Present Ownership & Lot.

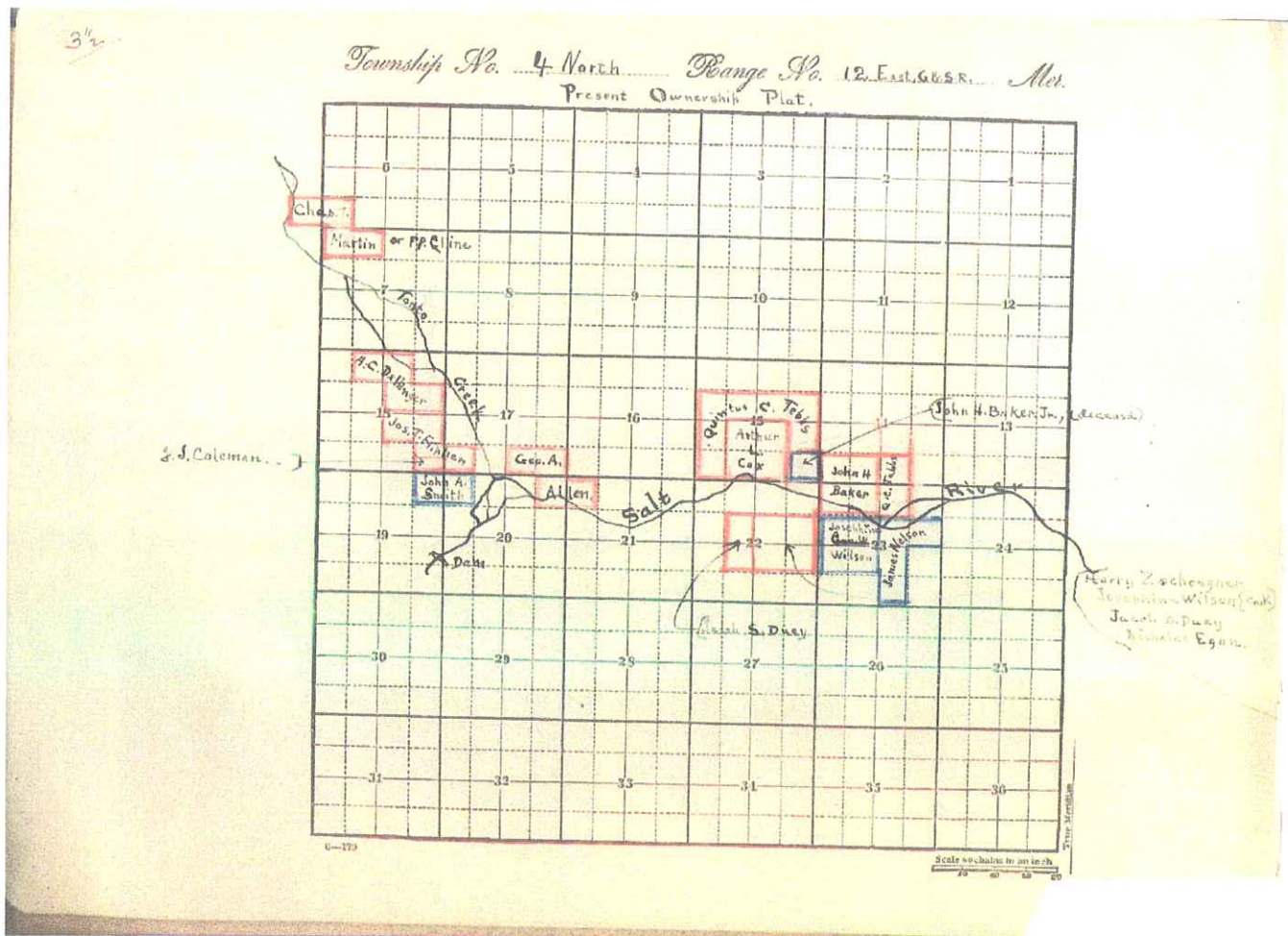
E.S.E. ca. 20-4/13
 Created by W.T. Conner
 Filed on by Moffatt



— Patented lands.
 — Entered but not patented.
 — School lands.

Scale 40 rods to an inch.

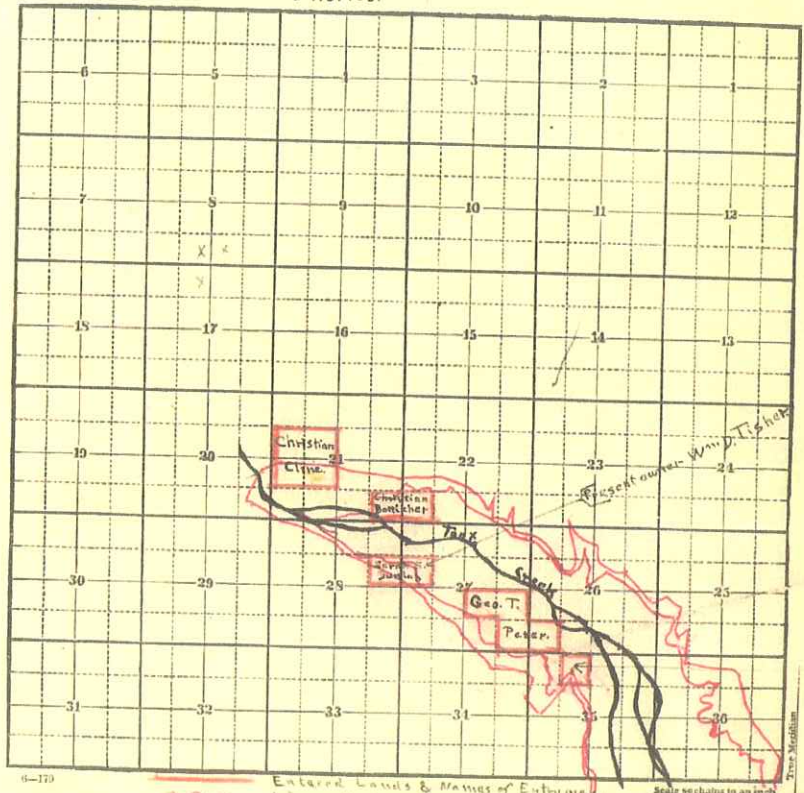
U.S. Geological Survey Map, Land Claims, 1903-04, along Upper Salt River, T4N, R13E



U.S. Geological Survey Map, Land Claims, 1903-04, along Upper Salt River, T4N, R12E

21 1/2

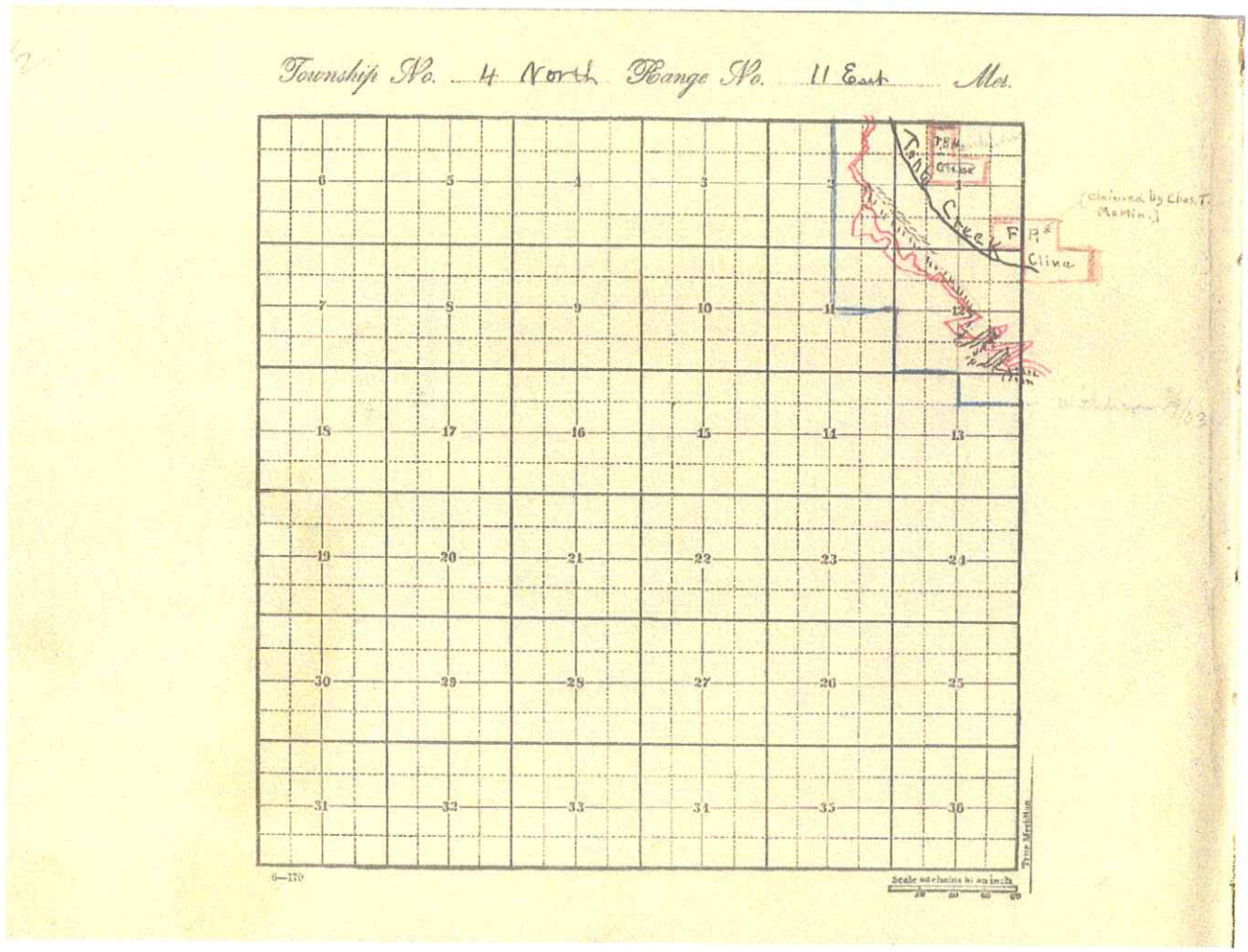
Township No. 5 North Range No. 11 East
Entries. Mrs.



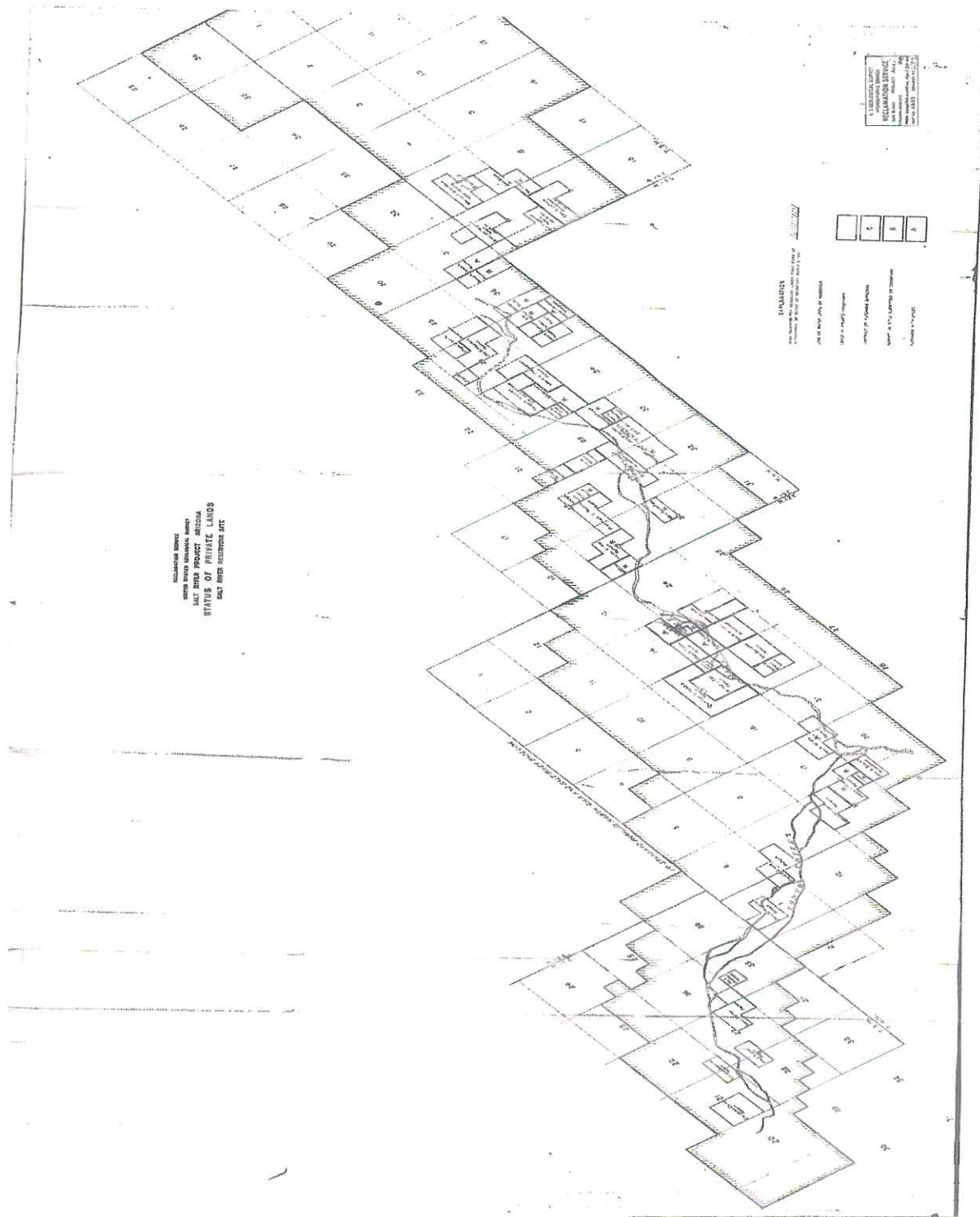
Geo. S. Metchem

Entered Lands & Names of Entrymen.
 Inner Line, from Map of Lines Hudson Reservoir Co.
 Outer " " " " Hudson Reservoir Co.
 Present owners the same as entrymen, except as otherwise noted.

U.S. Geological Survey Map, Land Claims, 1903-04, along Tonto Creek, T5N, R11E

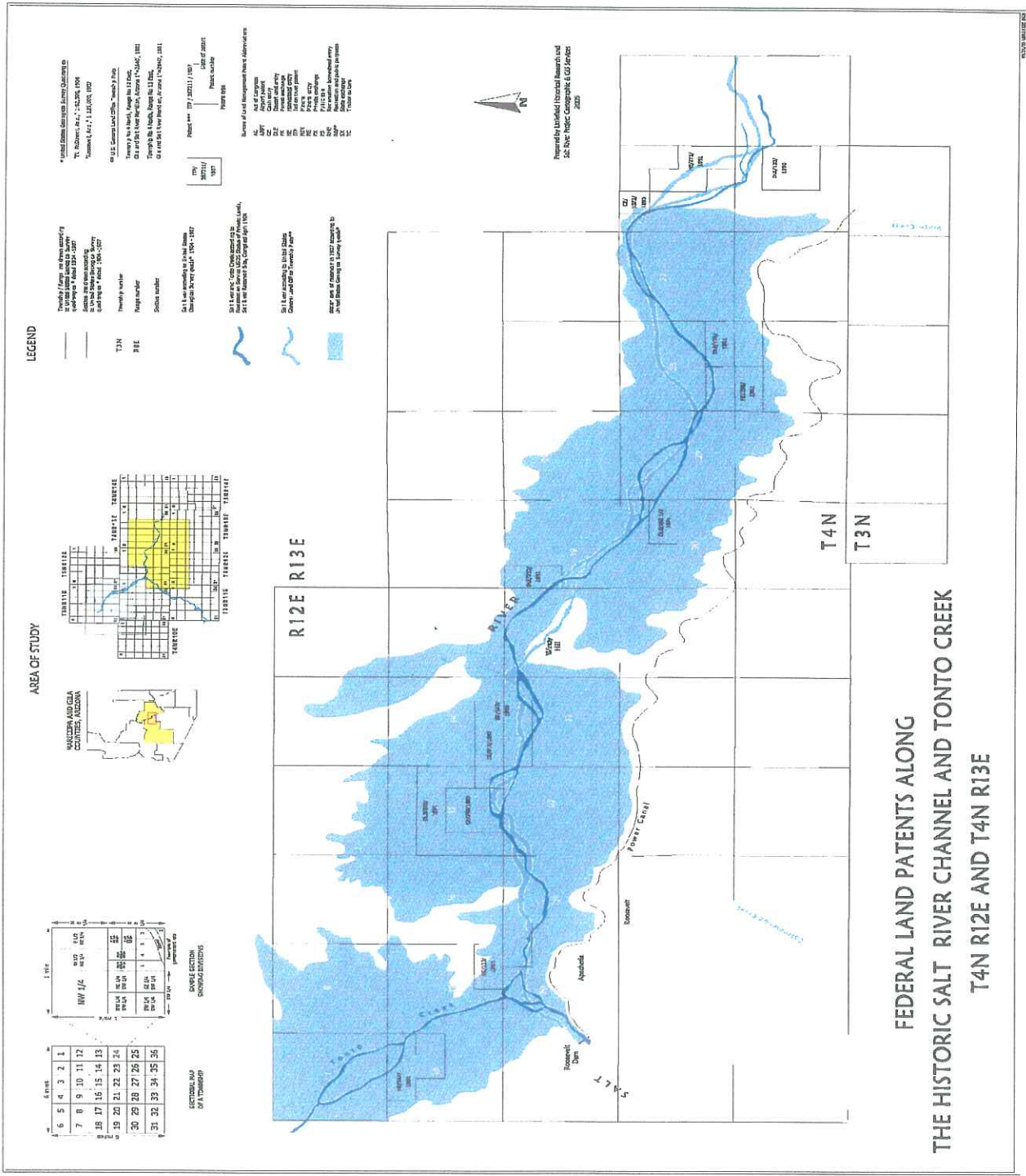


U.S. Geological Survey Map, Land Claims, 1903-04, along Tonto Creek, T4N, R11E



U.S. Geological Survey Map, 1904, Land Claims along the Salt River and Tonto Creek in the Vicinity of Theodore Roosevelt Lake

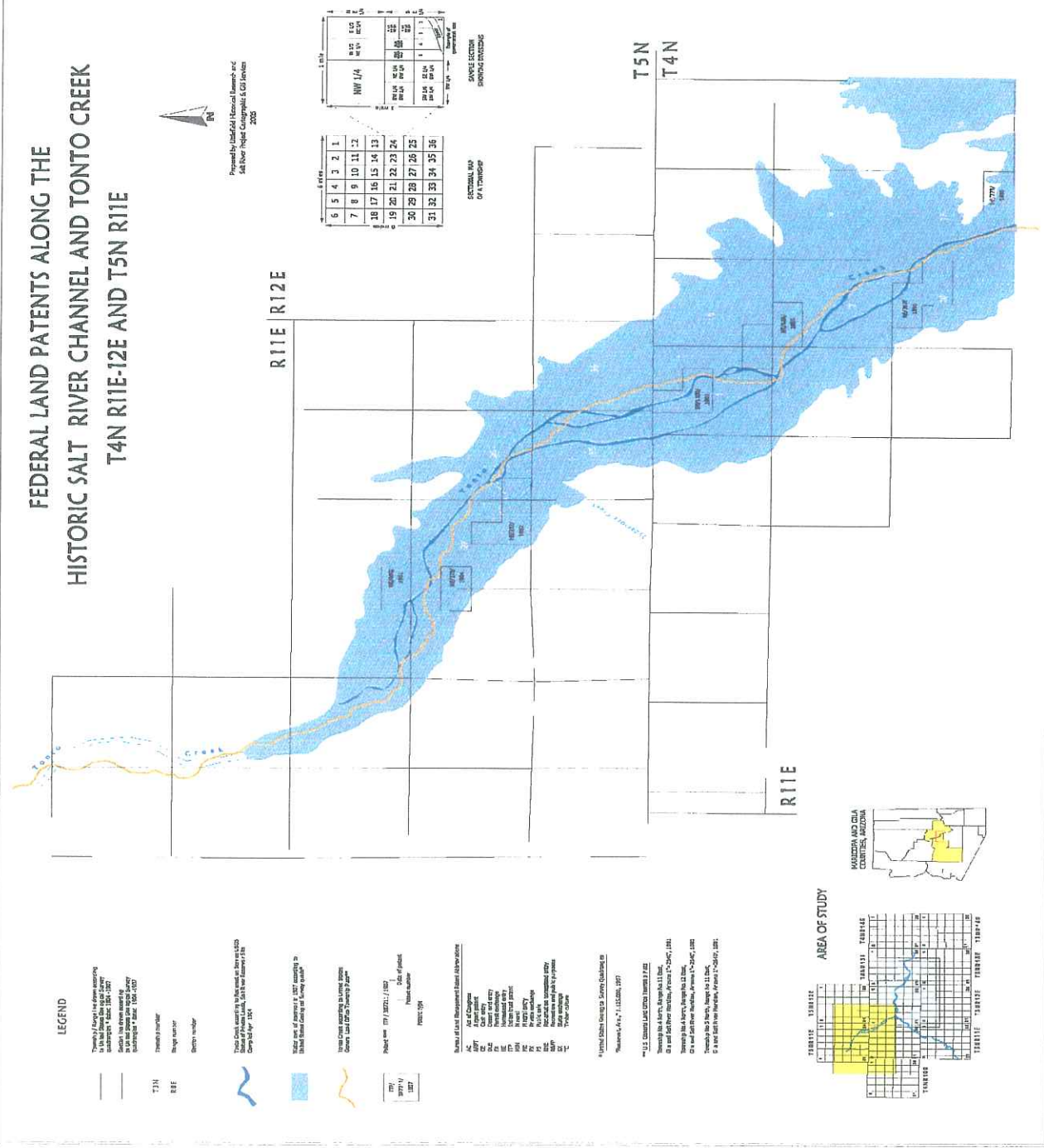
The three sets of maps discussed above – the original U.S. General Land Office survey plats (reproduced in Chapter I), the historic U.S. Geological Survey topographic maps (shown above in this Chapter of the report), and the Geological Survey land occupancy maps (also shown above) – all have been combined by the Salt River Project’s Cartographics Office to illustrate the location of the Upper Salt River and Tonto Creek as close to the time of Arizona’s Statehood as possible. Using the data from these combined historic maps, Salt River Project Cartographics produced new maps showing the locations of patents granted by the United States in relation to the positions of the Upper Salt River and Tonto Creek. These new maps are reproduced below. It should be noted that these new maps only show the area flooded by Theodore Roosevelt Lake. Due to public domain withdrawals discussed above, there were only a small number of federal patents in the study area of this report along the Upper Salt River below Roosevelt Dam and above Granite Reef Dam. Those patents that were granted between Roosevelt and Granite Reef Dam were awarded following Arizona’s Statehood in 1912 and therefore are of little use to this study. The patent maps reproduced below may be consulted for easy reference in relation to the discussion of federal patents that follows.



Map of Federal Land Patents along the Historic Salt River Channel and Tonto Creek, T4N, R12E, and T4N, R13E, Littlefield Historical Research and Salt River Project Cartographics & GIS Services, 2005

FEDERAL LAND PATENTS ALONG THE HISTORIC SALT RIVER CHANNEL AND TONTO CREEK T4N R11E-12E AND T5N R11E

Prepared by Littlefield Historical Research and
Salt River Project Cartographics & GIS Services
2005



LEGEND

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- Range boundary
- Section boundary
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Section	1	2	3	4	5	6
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13	14	15	16	17	18	
19	20	21	22	23	24	
25	26	27	28	29	30	
31	32	33	34	35	36	

SECTIONAL MAP
OF A TOWNSHIP

SECTIONAL MAP
OF A TOWNSHIP

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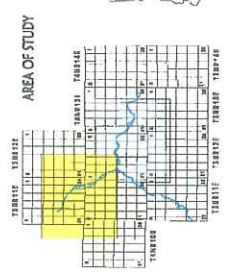
SECTIONAL MAP
OF A TOWNSHIP

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Map of Federal Land Patents along the Historic Salt River Channel and Tonto Creek, T4N, R11E-12E and T5N, R11E, Littlefield Historical Research and Salt River Project Cartographics & GIS Services, 2005

B. BACKGROUND INFORMATION ON HOMESTEADING AND FEDERAL LAND PATENTS

With U.S. General Land Office surveys having provided an orderly system for the federal government to dispose of the public domain in Arizona Territory in the late nineteenth century, settlers began to acquire parcels of land through homesteading. The various homestead laws passed by the U.S. Congress³¹ generally required a settler to file an application and make a small payment for a given parcel of land with the nearby federal land office. The application would describe the land by township, range, and section, and within each six-hundred-forty-acre section by a fractional identification. For example, a typical one-hundred-sixty-acre parcel might be described as the northeast quarter of section 7, township 1 north, range 5 east, Gila and Salt River Meridian. A forty-acre parcel might be the northwest quarter of the southeast quarter, etc., and a twenty-acre parcel might be the west half of the southwest quarter of the southwest quarter, etc.

Once the application was filed, the settler was required to live on the land for a number of years and make certain improvements. When the necessary time had elapsed, he could return to the land office with witnesses to file affidavits stating he had complied with the homesteading requirements. There, he would also complete any remaining paperwork. The affidavits and paperwork created a patent file that contained a great deal of information about the settler and the land he wanted to acquire. The affidavits typically describe the parcel in question, the number of acres, the crops farmed, the improvements made, as well as other pertinent information. Depending on the parcel, the type of patent, and whether there was any controversy involved, the patent file might also contain other information such as court documents, correspondence, or

³¹ The most important of these laws was *An Act of Secure Homesteads to Actual Settlers on the Public Domain*, 12 Stat. 392 (1862).

other materials. If the land office approved the affidavits, the settler would pay an additional small fee, and he would be rewarded with the patent to his parcel.

In relation to the Upper Salt River and Tonto Creek in the region flooded by Roosevelt Lake, there were eighteen patents that were granted in sections overlapping or adjacent to those streams. (There were, of course, other settlers in the area who were either squatters or who had not perfected their patent applications by the time Roosevelt Dam was being built – see the U.S. Geological Survey sketch maps reproduced above – but this Chapter focuses on finalized patents.) The parcels covered by awarded patents can be located on the U.S. Bureau of Land Management’s Master Title Plats and Historical Indices, which are cartographic records of how the U.S. Government disposed of (or otherwise compromised) the public domain. Similarly, the legal descriptions of patent locations can also be determined from information on the patents themselves.

C. SIGNIFICANCE OF PATENTS TO THE SALT RIVER’S POTENTIAL NAVIGABILITY

Federal patents and their supporting files are important for several reasons in ascertaining the potential navigability of the Upper Salt River or lower Tonto Creek around the time of Statehood.³² First, the patents indicate the total amount of land awarded by the United States. If the Upper Salt River or Tonto Creek had flowed through the parcel and that stream had been navigable, federal officials would not have granted the title of the bed of the stream since the State of Arizona would own it due to the State’s sovereignty. As a result, a patent to a quarter section of land through which either stream flowed would have been recorded as somewhat less than one-hundred-sixty acres (a full section being six-hundred-forty acres). Moreover, if the

³² Copies of patents for this report were obtained from the U.S. Bureau of Land Management in Phoenix. Patent files were obtained from the National Archives in Washington, D.C.

Upper Salt River or Tonto Creek had been considered navigable, an irregularly-shaped parcel next to that waterway 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.”³³

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

Another reason why patents are important to help determine whether the Upper Salt River or Tonto Creek was navigable at the time of Statehood relates to the patents’ 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 Upper Salt

³³ 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.

River or Tonto Creek or whether he used either stream for other purposes. Again, nothing in the supporting files suggests that the Upper Salt River or Tonto Creek was navigable.

D. FEDERAL PATENTS TO PRIVATE PARTIES IN THE STUDY AREA

This report will discuss all federal patents to private individuals made in the primary study area (the region now flooded by Theodore Roosevelt Lake). In all cases, patents will be reviewed going downstream. It is important to note that for simplicity sake, not all patents and patent files will be discussed in this section and only representative samples will be reviewed in the text of this report. Nevertheless, in the course of research for this report, all patents and their supporting files have been examined; none contradicts the evidence that is presented here.

1. Federal Patents along the Salt River in the Area under Present-Day Theodore Roosevelt Lake (Township 4 North, Range 13 East)

The first township going downstream along the Upper Salt River inside the flooded area of Roosevelt Lake is township 4 north, range 13 east. One of the most upstream patents in this township was Homestead Entry 273. (Desert Land Entry 133, granted to Edmund Kenton in 1890 is farther upstream than Homestead Entry 273 along the Salt River in this township, but Desert Land Entry patents – including several others downstream from Homestead Entry 273 on the Upper Salt – will be discussed separately later in this report.) Homestead Entry Patent 273, which was granted to James R. Hazard on January 13, 1891, encompassed acreage in section 26 of this township, and according to the 1881 U.S. General Land Office survey, the Salt River flowed through the tract. When asked about the character of the land in his proof of settlement,

Hazard, replied that it was “mostly river bottom land, grazing and ordinary agricultural land.”³⁴

Thomas Blackburn and Charles A. Fisk, both of whom vouched for Hazard’s Homestead application as witnesses, confirmed Hazard’s farming activities, adding that Hazard had cultivated ten to twenty acres each season and watered the land with an irrigation ditch.³⁵

Although the Salt River ran through the parcel, the General Land Office granted Hazard a full 160 acres, deducting no area due to the presence of the river’s bed or banks.³⁶

Heading downstream on the Salt River from Homestead Entry 273, the United States awarded Cash Entry patent 1072 to Charles C. Griffin in 1895. Griffin’s parcel contained forty acres in section 26 of township 4 north, range 13 east. During his time as a resident on the land but before his patent was confirmed, Griffin had cleared the parcel. He also had built two houses, a corral, and a well.³⁷ A witness to Griffin’s settlement, J.H. Baker, described Griffin’s parcel as “desert land” despite the fact that the 1881 General Land Office survey of the area indicated that the Salt River coursed through the land. Baker also acknowledged that Griffin had settled on his homestead in 1888 and had farmed about 15 acres.³⁸

By 1903-1904, Griffin had also acquired the lands encompassed in James R. Hazard’s parcel in section 26 (discussed above). As the U.S. Government began assessing which lands

³⁴ Testimony of Claimant, James R. Hazard, May 15, 1888, Patent File for Homestead Entry 273, Land Entry Files, box 90, Records of the U.S. Bureau of Land Management, Record Group 49, U.S. National Archives, Washington, D.C.

³⁵ Testimony of Witness, Thomas J. Blackburn, May 15, 1888, Patent File for Homestead Entry 273, Land Entry Files, box 90, Records of the U.S. Bureau of Land Management, Record Group 49, U.S. National Archives, Washington, D.C.; Testimony of Witness, Charles A. Fisk, May 15, 1888, *ibid*.

³⁶ Homestead Entry Patent 273, James R. Hazard, Jan. 13, 1891, U.S. Bureau of Land Management, Phoenix, Arizona.

³⁷ Homestead Entry Patent 1072, Charles C. Griffin, June 19, 1895, U.S. Bureau of Land Management, Phoenix, Arizona; Testimony of Claimant, Charles C. Griffin, Sept. 18, 1893, Patent File for Homestead Entry 1072, Charles C. Griffin, Land Entry Files, box 77, Records of the U.S. Bureau of Land Management, Record Group 49, U.S. National Archives, Washington, D.C.

³⁸ Testimony of Witness, J. H. Baker, Sept. 18, 1893, Patent File for Homestead Entry 1072, Land Entry Files, box 77, Records of the U.S. Bureau of Land Management, Record Group 49, U.S. National Archives, Washington, D.C. See also Testimony of Witness, William T. McNelly, Sept. 18, 1893, *ibid*.

would need to be acquired due to flooding by Roosevelt Lake, federal officials recorded that the Government would have to pay Griffin for a full 160 acres in Hazard's former patent area – lands that Griffin now owned – as well as for complete 40 acres in Griffin's original Cash Entry grant.³⁹

Downstream from Griffin's land in township 4 north, range 13 east, is Homestead Entry Patent 290, 80 acres of which lay in section 28 and 80 acres in an adjacent parcel in section 33 (the latter of which contained the Upper Salt River). Awarded in 1891 to James B. Hocker, Patent 290 officially contained 160 acres, with no lands withheld due to the presence of the Salt River's bed or banks. Hocker and one of his witnesses confirmed that part of this parcel was "river bottom land" when Hocker submitted his final proof before gaining title to the land.⁴⁰

2. Federal Patents along the Salt River in the Area under Present-Day Theodore Roosevelt Lake (Township 4 North, Range 12 East)

Moving downstream from Charles C. Griffin's holdings, the next federal patent lying astride the Salt River (not including Desert Land Entries) was Homestead Entry 567. This patent, covering 80 acres, lay partly in section 14 and partly in section 23 of township 4 north, range 12 east. Awarded to Quintus C. Tebbs in 1893, the parcel contained 80 acres. Tebbs received title to the full 80-acre lot despite the presence of the Salt River's bed and banks.⁴¹

By 1903-1904, as the U.S. Government was determining which lands would be flooded by Theodore Roosevelt Lake, Tebbs continued to hold title to his original homestead grant. As a

³⁹ U.S. Geological Survey, "Township Plat and Abstract of Entries" [1903-1904], p. 15, Salt River Project, Phoenix, Arizona.

⁴⁰ Homestead Entry Patent 290, James B. Hocker, Jan. 13, 1891, U.S. Bureau of Land Management, Phoenix, Arizona; Testimony of Claimant, James B. Hocker, March 31, 1890, Patent File for Homestead Entry 290, James B. Hocker, Land Entry Files, box 90, Records of the U.S. Bureau of Land Management, Record Group 49, U.S. National Archives, Washington, D.C.; Testimony of Witness, George Danforth, March 31, 1890, *ibid.*

⁴¹ Homestead Entry Patent 567, Quintus C. Tebbs, March 27, 1893, U.S. Bureau of Land Management, Phoenix, Arizona.

result, in planning for payments for those parties whose land would have to be acquired for the reservoir, the Geological Survey recorded that Tebbs would need to be reimbursed for 80 acres for this parcel of land. The Geological Survey's map and related data book showing lands to be flooded gave no indication that anyone other than Tebbs held title to the full 80 acres even though the Salt River ran through the land.⁴²

Over the next five years, the U.S. Government continued to try to obtain title to Tebbs's land, but that objective was clouded because of Tebbs's failure to pay taxes on the parcel and related attempts to sell the land in relation to those overdue taxes. Ultimately, during condemnation proceedings to obtain the land for Theodore Roosevelt Lake, the Fifth Judicial District Court of the Territory of Arizona determined that Tebbs's heir, Charles H. Tebbs, should be paid for the full 80 acres encompassed in Quintus Tebbs's original Homestead Entry. During all the proceedings related to the tax issue and condemnation suit, no question ever was raised over the ownership of lands lying in the Salt River flowing through this land.⁴³

Downstream along the Salt River from Quintus Tebbs's land was Cash Entry Patent 915. This patent, awarded in 1892 to Charles H. Tebbs, covered 80 acres in section 14 and 80 acres in section 23 of township 4 north, range 12 east. Regardless of the Upper Salt River's presence in this parcel, the General Land Office awarded Charles Tebbs the full 160 acres to this patent.⁴⁴ Similarly, in 1903-1904 when the Geological Survey compiled its list of lands to be submerged

⁴² U.S. Geological Survey, "Township Plat and Abstract of Entries" [1903-1904], p. 5, Salt River Project, Phoenix, Arizona.

⁴³ See file 2-44, Salt River Project, Purchase of Lands, Q.C. Tebbs, box 843, Entry 3, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

⁴⁴ Cash Entry Patent 915, Charles H. Tebbs, Feb. 18, 1892, U.S. Bureau of Land Management, Phoenix, Arizona.

by Theodore Roosevelt Lake, the agency recorded that the parcel contained 160 acres (although by this time it was owned by John H. Baker).⁴⁵

Cash Entry Patent 248 lay just downstream along the Salt River from Charles Tebbs's parcel and contained 80 acres in section 15 of township 4 north, range 12 east. Awarded to Arthur L. Cox in 1885, Cash Entry 248 included part of the Salt River, which ran from east to west through the southern part of the patent. Nevertheless, no acreage was deducted from Cox's patent due to presence of the Salt River.⁴⁶ Cox still owned this land in 1903-1904 when the U.S. Geological Survey was compiling its list of lands that would be inundated by Theodore Roosevelt Lake, but that agency continued to note that the parcel contained a full 160 acres despite the presence of the Salt River.⁴⁷

Near the confluence of the Upper Salt River and Tonto Creek and downstream from Arthur Cox's patent was Homestead Entry Patent 223. George A. Allen received this patent on July 3, 1890, and it encompassed 160 acres, including lands through which the Upper Salt River flowed.⁴⁸ Allen still owned this land in 1903-1904 when the Geological Survey was determining which lands would be needed for Theodore Roosevelt Lake, and the agency confirmed at that time that Allen's parcel consisted of a full 160 acres even though the Salt River ran through those lands.⁴⁹

⁴⁵ U.S. Geological Survey, "Township Plat and Abstract of Entries" [1903-1904], p. 5, Salt River Project, Phoenix, Arizona.

⁴⁶ Cash Entry Patent 248, Arthur L. Cox, Oct. 22, 1885, U.S. Bureau of Land Management, Phoenix, Arizona.

⁴⁷ U.S. Geological Survey, "Township Plat and Abstract of Entries" [1903-1904], p. 6, Salt River Project, Phoenix, Arizona.

⁴⁸ Homestead Entry Patent 223, George A. Allen, July 3, 1890, U.S. Bureau of Land Management, Phoenix, Arizona.

⁴⁹ U.S. Geological Survey, "Township Plat and Abstract of Entries" [1903-1904], p. 7, Salt River Project, Phoenix, Arizona.

3. Federal Patents along Tonto Creek in the Area under Present-Day Theodore Roosevelt Lake (Township 5 North, Range 11 East)

The uppermost area of Tonto Creek submerged by Theodore Roosevelt Lake around the time of Arizona's Statehood in 1912 lay in township 5 north, range 11 east. In this township, Homestead Entry Patent 650 in section 18 was awarded to Christian Botticher on December 17, 1901. Although Tonto Creek ran through the southwest corner of Botticher's land according to the Geological Survey's sketch maps from 1903-1904, Botticher was awarded the full 80 acres in the parcel in 1901 and the Geological Survey continued to assume that he held 80 acres as of 1903-1904.⁵⁰ (The 1881 General Land Office plat of this township indicates that Tonto Creek lay slightly to the south of this position and not in Botticher's land.)

4. Federal Patents along Tonto Creek in the Area under Present-Day Theodore Roosevelt Lake (Township 4 North, Range 11 East)

Downstream from Botticher's claim was Homestead Entry Patent 1100, which was granted to John Boyne Henderson. This patent, which covered the east half of the northwest quarter and the southwest quarter of the northeast quarter of section 1 in township 4 north, range 11 east, covered 120 acres, including Tonto Creek according to the 1881 General Land Office Survey plat of the township as well as the 1903-1904 Geological Survey sketch maps and related data. Nonetheless, the General Land Office awarded the full 120 acres to Henderson on August 29, 1901 despite the presence of the stream.⁵¹

During the construction of the Salt River Project and Roosevelt Dam, the Reclamation Service attempted to reach an agreement with Henderson on the value of his property – lands the

⁵⁰ Homestead Entry Patent 650, Christian Botticher, Dec. 17, 1901, U.S. Bureau of Land Management, Phoenix, Arizona; U.S. Geological Survey, "Township Plat and Abstract of Entries" [1903-1904], (page number missing), Salt River Project, Phoenix, Arizona..

⁵¹ Homestead Entry Patent 1100, John Boyne Henderson, Aug. 29, 1901, U.S. Bureau of Land Management, Phoenix, Arizona; U.S. Geological Survey, "Township Plat and Abstract of Entries" [1903-1904], p. 1, Salt River Project, Phoenix, Arizona..

Government wanted to obtain because they would be flooded by Theodore Roosevelt Lake. Negotiations over Henderson's land began in 1904, and the matter was not settled until 1909, when the Fifth Judicial Court for the Territory of Arizona awarded Henderson \$2,000.00 for his lands. Importantly, during this entire time, the Government treated the parcel as if it contained a full 120 acres even though Tonto Creek flowed through it. Moreover, in a March 25, 1907, letter attempting to resolve the dispute over the land's value to Marcus A. Smith, Arizona's Territorial Delegate to Congress, Government officials described Henderson's land as being "part of the river bottom" and composed of "sand-wash."⁵² For his part, Smith characterized the Government's negotiations over the price to be paid for Henderson's land as an attempt to "screw them [land owners in the Theodore Roosevelt Lake area] down to the last nickel[,]" but Smith did not dispute the statement that Tonto Creek's "river bottom" lay within Henderson's parcel.⁵³

5. Federal Patents along Tonto Creek in the Area under Present-Day Theodore Roosevelt Lake (Township 4 North, Range 12 East)

Moving downstream from Henderson's land, in 1895 the United States granted to Frank P. Cline Homestead Entry Patent 629, most of which lay in township 4 north, range 12 east but a part of which also was in township 4 north, range 11 east. This patent comprised 152 acres and 16/100ths of an acre, and Tonto Creek flowed through it according to the 1881 General Land Office survey plat. Although the patent contained fractional lots, its odd acreage size was due to

⁵² See file 2-46, Salt River Project, Purchase of Lands, J.B. Henderson, box 839, Entry 3, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado. The quotations are in Director to M.A. Smith, March 25, 1907, *ibid.* See also Supervising Engineer to the Director, U.S. Reclamation Service, March 12, 1908, *ibid.*

⁵³ Territorial Delegate to Congress M.A. Smith to F.H. Newell, Chief of the Reclamation Service, Feb. 19, 1907, file 2-46, Salt River Project, Purchase of Lands, J.B. Henderson, box 839, Entry 3, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

adjustments to the township's acreage along its northern and western borders to accommodate the irregularities in the earth's surface and was not due to the presence of Tonto Creek. Cline was awarded the complete area of his claim although Tonto Creek was present on part of the land.⁵⁴

The final patent going downstream on Tonto Creek before that stream's confluence with the Upper Salt River was Homestead Entry Patent 367. Awarded to John A. Vineyard on November 9, 1891, Tonto Creek flowed through the northeast corner of the parcel, which encompassed lands in section 18 of township 4 north, range 12 east. Even though Tonto Creek ran through the property, the U.S. Government gave Vineyard title to a full 160 acres.⁵⁵ The Geological Survey's data book compiled in 1903-1904 recorded that this parcel had been transferred to A.C. Dillinger (also spelled Dellinger) by the time the Survey compiled its information on lands to be submerged by Theodore Roosevelt Lake. Yet the Survey's information continued to note that the parcel held 160 acres despite Tonto Creek's presence.⁵⁶

E. THE *DESERT LAND ACT OF 1877*

Aside from the federal Homestead and Cash Entry patents discussed above, other homesteads on the public domain in Arizona in the Roosevelt Lake area were acquired by settlers under the terms of the *Desert Land Act*. Intending to provide further opportunity to settle western lands, the *Desert Land Act* was signed into law on March 3, 1877. This statute, unlike other U.S. homestead legislation, allowed a settler to file an application for up to 640 acres, by

⁵⁴ Homestead Entry Patent 629, Frank P. Cline, Jan. 18, 1895, U.S. Bureau of Land Management, Phoenix, Arizona.

⁵⁵ Homestead Entry Patent 367, John A. Vineyard, Nov. 9, 1891, U.S. Bureau of Land Management, Phoenix, Arizona.

⁵⁶ U.S. Geological Survey, "Township Plat and Abstract of Entries" [1903-1904], p. 7, Salt River Project, Phoenix, Arizona.

far the largest tract of land allowed for a single person under any of the U.S. homestead laws. The act required that the settler reclaim and cultivate a piece of desert land through irrigation before a final patent would be awarded.

The law also specified that the water to be used for irrigation was to come from a non-navigable stream. The language in the *Desert Land Act* stated:

Provided however that the right to the use of water by the person so conducting the same, on or to any tract of desert land of six hundred and forty acres shall depend upon bona fide prior appropriation: and such right shall not exceed the amount of water actually appropriated, and necessarily used for the purpose of irrigation and reclamation: and all surplus water over and above such actual appropriation and use, together with the water of all, lakes, rivers and other sources of water supply upon the public lands *and not navigable*, shall remain and be held free for the appropriation and use of the public for irrigation, mining and manufacturing purposes subject to existing rights. [Emphasis added.]⁵⁷

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.”⁵⁸ The meaning of this statement in relation to the *Desert Land Act* was simply that to deplete waterways by using water for irrigation purposes, those streams had to be non-navigable.

The requirements of the *Desert Land Act* shed light on the potential navigability of the Upper Salt River. (There were no perfected Desert Land entries along Tonto Creek.) In the

⁵⁷ *An Act to Provide for the Sale of Desert Lands in Certain States and Territories*, 19 Stat. 377 (1877).

⁵⁸ *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.

townships along the Salt River in the area from the inundation lines of Theodore Roosevelt Lake to Roosevelt Dam (there were no perfected Desert Land entries on the Salt River between Roosevelt Dam and Granite Reef Dam), there were five perfected entries under the *Desert Land Act*. Four of these were in township 4 north, range 13 east, and one in township 4 north, range 12 east. All of the Desert Land entry applicants along the Salt River intended to obtain water from that stream. When considered in relation to the requirements of the *Desert Land Act*, the logical conclusion from these applications is that the Salt River (as the source for reclamation water for these lands) must have been considered non-navigable by the applicants as well as by the administrators of the U.S. General Land Office.

The history of the study area's *Desert Land Act* patents supports the conclusions reached from the representative Homestead and Cash Entry patents discussed above. Similar to those patents, no mention was made in the *Desert Land Act* applications of reserving the bed and the banks of the Upper Salt River due to the sovereign rights of the State. Likewise, the use of the Upper Salt River as the source of irrigation water to satisfy the terms of the *Desert Land Act* also indicated that the stream was considered non-navigable.

1. Desert Land Patents along the Salt River in the Area under Present-Day Theodore Roosevelt Lake (Township 4 North, Ranges 12 and 13 East)

The most upstream Desert Land entry in the study area of this report was Desert Land Patent 133 in section 35 of township 4 north, range 13 east. This patent, covering the south half of the northeast quarter and the north half of the southeast quarter of section 35, included 160 acres and was awarded to Edmund Kenton on August 20, 1890.⁵⁹ In an affidavit supporting his application, Kenton testified that he had conducted water on the land for irrigation purposes and

⁵⁹ Desert Land Entry Patent 133, Edmund Kenton, Aug. 20, 1890, U.S. Bureau of Land Management, Phoenix, Arizona.

reclaimed the land. He also stated that “the river was so low last season [that I] could not irrigate the entire tract” and that he had considerably enlarged and improved his ditch to allow possible irrigation of the entire 160 acres. Moreover, Kenton asserted that his source of water came from “digging the ditch and appropriating the water from the Salt River.”⁶⁰ One of Kenton’s witnesses, Nathan H. Livingston, confirmed Kenton’s use of Salt River water for irrigation. When asked if Kenton had the right to water sufficient to irrigate his tract, Livingston replied “Yes.”⁶¹

By 1903-1904, when the U.S. Geological Survey was determining which lands were to be flooded by Theodore Roosevelt Lake, Edmund Kenton’s holdings had been transferred to two other parties, S.W. Kenton and Harry Zschoeg. Nevertheless, the Geological Survey’s records indicated that the two combined parcels totaled 160 acres – the same acreage awarded to Edmund Kenton – even though the Salt River flowed through the eastern part of S.W. Kenton’s 80-acre parcel.⁶²

Downstream from Edmund Kenton’s Desert Land Entry was Desert Land Entry 174, awarded to Peter C. Robertson in 1891. Robertson’s 160-acre parcel lay in the south half of the southeast quarter of section 28 and the north half of the northeast quarter of section 33 in township 4 north, range 13 east.⁶³ In his affidavit for final proof, Robertson stated that his land was on the south side of and near the Salt River in Gila County, Arizona. He further asserted

⁶⁰ Deposition of Applicant, Edmund Kenton, Apr. 27, 1888, Patent File for Desert Land Entry 133, Edmund Kenton, box 136, Records of the U.S. Bureau of Land Management, Record Group 49, U.S. National Archives, Washington, D.C.

⁶¹ Deposition of Witness, Nathan H. Livingston, Apr. 27, 1888, Patent File for Desert Land Entry 133, Edmund Kenton, box 136, Records of the U.S. Bureau of Land Management, Record Group 49, U.S. National Archives, Washington, D.C. Witness W.H. Middleton also confirmed Kenton’s use of the Salt River for irrigation purposes. See Deposition of Witness, W.H. Middleton, April 27, 1888, *ibid.*

⁶² U.S. Geological Survey, “Township Plat and Abstract of Entries” [1903-1904], p. 21, Salt River Project, Phoenix, Arizona.

⁶³ Desert Land Entry Patent 174, Peter C. Robertson, April 30, 1891, U.S. Bureau of Land Management, Phoenix, Arizona.

that he had a clear right to the use of water sufficient to irrigate his parcel and for keeping the land permanently irrigated. When asked to state the source of water and how it was acquired, Robertson responded, "Water is obtained from [the] Salt River by means of a ditch which will carry some 1200 inches of water acquired partly by purchase and partly by labor."⁶⁴ E.E. Kennedy, a witness for Robertson, confirmed in his deposition that Robertson had conveyed water upon his land by means of two ditches, several cross ditches, and one main ditch running nearly around the tract. Kennedy further said that "the water is taken from the Salt River."⁶⁵

Downstream from Robertson's Desert Land Entry was a Desert Land Entry awarded to William H. Duryea. Duryea's Desert Land Entry 260 1/2 (the parcel was, indeed, identified as Entry 260 and one-half) covered 80 acres in the south half of the northeast quarter of section 30 of township 4 north, range 13 east.⁶⁶ This parcel, which was recorded by the Geological Survey in 1903-1904 as being owned by M.A.B. Fuss, contained the Salt River. Yet Duryea was granted Desert Land Patent 260 1/2 containing a full 80 acres, and the Geological Survey recorded the parcel in 1903-1904 as being 80 acres in size.⁶⁷

The final two Desert Land Entries along the Salt River in the area inundated by Theodore Roosevelt Lake were both granted in 1891. These were Desert Land Patent 232 in section 19 of

⁶⁴ Deposition of Applicant, Peter C. Robertson, May 4, 1888, Patent File for Desert Land Entry 174, Peter C. Robertson, box 137, Records of the U.S. Bureau of Land Management, Record Group 49, U.S. National Archives, Washington, D.C.

⁶⁵ Deposition of Witness, E.E. Kennedy, May 4, 1888, Patent File for Desert Land Entry 174, Peter C. Robertson, box 137, Records of the U.S. Bureau of Land Management, Record Group 49, U.S. National Archives, Washington, D.C. Witness B.W. Curtis also confirmed Robertson's use of the Salt River for irrigation purposes. See Deposition of Witness, B.W. Curtis, May 4, 1888, *ibid.* See also testimony of George Danforth and J.B. Hocker, Oct. 9, 1888, *ibid.*

⁶⁶ Desert Land Entry Patent 260, William H. Duryea, Oct. 8, 1891, U.S. Bureau of Land Management, Phoenix, Arizona.

⁶⁷ U.S. Geological Survey, "Township Plat and Abstract of Entries" [1903-1904], p. 19, Salt River Project, Phoenix, Arizona.

township 4 north, range 13 east, granted to Henry Armer⁶⁸ and Desert Land Patent 229 containing acreage in section 15 of township 4 north, range 12 east, and granted to Quintus C. Tebbs.⁶⁹ Armer's parcel was listed in his patent as having slightly less than 80 acres, but this was due to surveying corrections made at the edge of the township not due to the presence of the Salt River, which ran through the lot. Tebbs was awarded the full 280 acres in his claim, but apparently the Salt River did not run through this parcel but only near to it. Although the patent files for these two final Desert Land entries were not available from the National Archives, it is reasonable to assume that the source of water for these lands was the Upper Salt River, particularly for Desert Land Entry 232 which contained that stream.

F. FEDERAL LAND GRANTS TO ARIZONA

Arizona, like other public domain states, obtained land by Congressional grants to support public interest objectives prior to and following Statehood. Historically, such grants to new states had started with Ohio's admission to the Union in 1802, although over the years the types and sizes of the grants varied from state to state.⁷⁰

Grants to Arizona covered a variety of purposes. For example, prior to Statehood, Congress reserved in 1850 for Arizona and other western territories all the acreage in sections 16 and 36 in each township for the purpose of supporting public schools.⁷¹ In addition, in 1881

⁶⁸ Desert Land Entry Patent 232, Henry Armer, March 4, 1891, U.S. Bureau of Land Management, Phoenix, Arizona.

⁶⁹ Desert Land Entry Patent 229, Henry Quintus C. Tebbs, March 4, 1891, U.S. Bureau of Land Management, Phoenix, Arizona.

⁷⁰ A detailed discussion of lands granted to various states can be found in Jon A. Souder and Sally K. Fairfax, *State Trust Lands; History, Management, & Sustainable Use* (Lawrence: University of Kansas Press, 1996).

⁷¹ *An Act Proposing to the State of Texas the Establishment of Her Northern and Western Boundaries, the Relinquishment by the Said State of All Territory Claimed by Her Exterior to Said Boundaries, and of All Her Claims upon the United States, and To Establish a Territorial Government for New Mexico*, 9 Stat. 446 (1850). This law, most commonly known as the Compromise of 1850 due to its attempt to resolve the slavery issue in the United States in the years before the Civil War, also contained the provision that states carved out of territories

Congress granted seventy-two sections (46,080 acres) to be chosen by Arizona in support of universities.⁷² Further public domain lands went to Arizona in 1910 under the provisions of the *Enabling Act* for Arizona and New Mexico, which reserved to each territory sections 2 and 32 (also for schools).⁷³ Finally, in 1929, Congress provided to Arizona another 50,000 acres from the public domain to fund miners' hospitals.⁷⁴

Aside from Arizona's sovereign lands (which were determined by navigability and not by an act of Congress) and the State's acreage in sections 2, 16, 32, and 36, Arizona was allowed considerable leeway in selecting the other federally granted lands. In addition, Arizona had significant flexibility in choosing "in-lieu" (also known as "indemnity") acreage if mineral lands (which Congress specifically forbade Arizona from choosing from the public domain) or Indian reservations overlay any section 2, 16, 32, or 36. Likewise, the United States retained public domain lands suitable for the development of hydroelectric power, and the Government could withdraw from the public domain (and, hence, lands available for Arizona's selection) any lands necessary for reclamation projects, national forests, or other purposes useful for federal reasons. Nevertheless, Arizona could select in-lieu lands elsewhere in the State for any acreage not otherwise available under the terms of various Congressional grants. Likewise, if a navigable body of water overlay any of the four specifically granted sections, the State could take lands equal in size to the total area of the bed of the body of water elsewhere.

gained from Mexico at the end of the Mexican War would each receive sections 16 and 36 to support public schools. See Section 15 of this statute.

⁷² *An Act to Grant Lands to Dakota, Montana, Arizona, Idaho, and Wyoming for University Purposes*, 21 Stat. 326 (1881).

⁷³ Section 6, *An Act to Enable the People of New Mexico to Form a Constitution and State Government and Be Admitted into the Union on an Equal Footing with the Original States; and To Enable the People of Arizona to Form a Constitution and State Government and Be Admitted to the Union on an Equal Footing with the Original States*, 36 Stat. 557 (1910).

⁷⁴ *An Act Making an Additional Grant of Lands for Miners' Hospitals for Disabled Miners in the States of Utah and Arizona, and for Other Purposes*, 45 Stat. 1252 (1929).

Significantly, Arizona made no in-lieu selections to compensate for the area covered by the Upper Salt River's bed in sections 2, 16, 32, and 36 or in other federal lands granted to the State where they overlay the Upper Salt River or Tonto Creek. Indeed, for those sections 2, 16, 32, and 36, where Tonto Creek or the Upper Salt River lay, Arizona only asked for and received in-lieu selections for the acreage directly involved in those sections and not for any acreage related to the presence of the Salt River or Tonto Creek.⁷⁵

G. CONCLUSIONS REGARDING U.S. PATENTS AND GRANTS TO THE STATE OF ARIZONA

In conclusion, the federal government granted to individual parties nearly twenty separate patents that touched or overlay the Upper Salt River or Tonto Creek. 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 Upper Salt River or Tonto Creek by the State of Arizona. In each case where patents were applied for, several parties expressed implicit opinions on the non-navigability of the Salt River or Tonto Creek through the request for and award of lands through which these streams flowed. These individuals included the patentee, his witnesses, and officials of the U.S. General Land Office. It is significant that cumulatively, these opinions were spread chronologically in many years, throughout different seasons, and over a large geographic area. Collectively, therefore, the history of federal patents and Congressional grants to the State of Arizona strongly suggest that both federal and state officials did not perceive the Salt River and Tonto Creek to be navigable.

⁷⁵ See "Clear Lists" for Indemnity Selections, U.S. Bureau of Land Management, Phoenix, Arizona.

CHAPTER III: U.S. GOVERNMENT DOCUMENTS AND MISCELLANEOUS NON-GOVERNMENT RECORDS

Although U.S. Government survey records and documents relating to federal patents and land grants to Arizona are crucial to understanding perceptions of the Upper Salt River and Tonto Creek prior to and in 1912, other U.S. Government records – both published and unpublished – provide a wealth of supplemental information concerning those streams. Two of the most important federal agencies concerned with the region were the U.S. Geological Survey and the U.S. Reclamation Service. Both of these 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 Upper Salt River and/or Tonto Creek before and at the time of Arizona Statehood. In addition, another federal agency whose records reveal the nature of the Salt River is the Office of Experiment Stations in the U.S. Department of Agriculture. This agency established field locations to advance agriculture and irrigation, and in carrying out its work, its officials collected useful data on the Upper Salt River and Tonto Creek. All of these federal agency records support the evidence provided in Government surveys and homestead files that the Upper Salt River and Tonto Creek were not navigable in 1912.

In addition to U.S. Government records, a wide variety of other sources also indicate the contemporaneous view that the Upper Salt River and Tonto Creek were not navigable. These records include engineering documents, various records of floods, legislative action and litigation, and more recent historical studies. These materials, ranging chronologically from the late nineteenth century well into the twentieth century, support the findings in other parts of this report.

A. RECORDS OF THE U.S. GEOLOGICAL SURVEY

The U.S. Geological Survey became involved in examining water resources in the West as early as 1888 when the agency's director, John Wesley Powell, began what became known as the "Powell Irrigation Survey." Essentially a study of arid lands in the West that might be reclaimed by storing and diverting water from the region's streams, Powell's work started what was to become increasingly frequent commentary in the Geological Survey's records regarding water resources throughout the western part of the United States. Some of the most perceptive descriptions of the West's rivers and streams were contained in the Geological Survey's *Annual Reports*.

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

The yearly reports drafted by the Geological Survey contain detailed information on many streams in the West, including the Upper Salt River. For example, the *Eleventh Annual Report of the U.S. Geological Survey* (1891), which focused specifically on irrigation, generally described streams draining the Gila Basin (which include the Upper Salt River and Tonto Creek). Stating that all rivers in this basin were highly erratic, John Wesley Powell, who authored this *Annual Report*, wrote:

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

sand-bars, is loaded with this mass of sand, gravel, and driftwood – most formidable weapons for destruction.⁷⁶

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

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

short, sudden floods carrying considerable volume of water for a few hours, and at longer intervals, perhaps of three or five years, there are enormous floods, whose violence and duration is phenomenal. These latter, however, are rather to be feared than to be depended upon as beneficial.⁷⁷

The *Report* added further details about the nature of these floods along the Salt. The *Report's* author (who was unidentified) discussed interviews with local citizens. Although the author's discussion focused on the Salt River near Phoenix, his comments were equally applicable to the Salt River above Granite Reef Dam. In fact, given that the stream there is narrower than in the Phoenix area, the characteristics of the flood described by the *Report's* author would have been enhanced above Granite Reef Dam. The *Report's* author stated that the

⁷⁶ *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.

⁷⁷ *Twelfth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1890-91, Part II-Irrigation* (Washington D.C.: U.S. Government Printing Office, 1891), pp. 298, 312-313.

irregular character and extraordinary fluctuations of the stream are clearly brought out. The most notable feature is the great flood of February 21, 1890, when, according to Mr. Davidson's [engineer of the Arizona Canal Company, an irrigation canal near Phoenix] computations, the discharge increased suddenly from 1,000 second-feet to over 143,000 second-feet. This, however, is eclipsed by the flood of February 18 to 25, 1891. . . . On February 17 the mean discharge was 835 second-feet, increasing the next day to 154,000 second-feet, and on the 20th only 69,100, and on the 22d 14,890. This was followed by a second swell greater than the first, the flood increasing until on the 24th a maximum of 300,000 second-feet was reached. This subsided almost as rapidly as it came, so that by the second day after the river was carrying less than 15,000 second-feet. . . . The Arizona Canal Company's weir across the Salt River was damaged, a portion of the canal washed out, and the channel of the stream so altered that computations of daily discharge could no longer be made without new data.⁷⁸

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

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

The nonperiodic oscillations give rise to the greatest concern on the part of the engineer and the irrigator, for while he can be reasonably certain regarding the character of the periodic variation, he must at all times be on the watch for extraordinary occurrences for which there are no analogies. The rivers and lakes may for a time increase in volume or may apparently shrink so greatly as to cause serious alarm as to their permanence. . . . The river is subject to some of the greatest floods which have occurred in the west, due to cloudbursts falling over certain portions of the basin. In the early spring of 1890 an extraordinary flood occurred in the Salt river, increasing its discharge for a short period of time to 141,000 second-feet.⁷⁹

⁷⁸ *Twelfth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1890-91, Part II-Irrigation* (Washington D.C.: U.S. Government Printing Office, 1891), pp. 298, 312-313.

⁷⁹ *Thirteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1891-92, Part III-Irrigation* (Washington D.C.: U.S. Government Printing Office, 1893), pp. 18, 95-96, 175-176.

As the *Report* indicated, these frequent and violent floods demonstrate the Upper Salt River's unreliable character and show that navigation on a regular basis would have been difficult at best.

2. U.S. Geological Survey Water Supply Papers

In addition to *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 Upper Salt River and/or Tonto Creek. For instance, Arthur P. Davis, author of Water Supply Paper No. 2, *Irrigation Near Phoenix, Arizona* (1897), characterized the "streams of this country" (Arizona) as "extremely irregular in character, fluctuating at times with great rapidity, floods coming down without warning, and disappearing in the course of a few hours."⁸⁰

Six years after the Geological Survey issued *Irrigation Near Phoenix, Arizona*, the agency published Water Supply Paper No. 73, *Water Storage on Salt River, Arizona* (1903). This study (also written by Arthur P. Davis) focused principally on the proposed construction of what eventually became known as Roosevelt Dam on the Upper Salt River, and Water Supply Paper No. 73 once again noted that the Salt River was "more or less torrential in character, the combined flow [of the Salt and Verde rivers] dwindling at times to about 100 cubic feet per second, and at other times reaching a volume more than one hundred times as great."⁸¹

⁸⁰ Arthur P. Davis, *Irrigation Near Phoenix, Arizona* U.S. Geological Survey Water Supply Paper No. 2 (Washington D.C.: U.S. Government Printing Office, 1897), pp. 9, 11, 50-51.

⁸¹ Arthur P. Davis, *Water Storage On Salt River, Arizona*, U.S. Geological Survey Water Supply Paper No. 73 (Washington D.C.: U.S. Government Printing Office, 1903), p. 9.

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

Aside from the *Annual Reports* and Water Supply Papers created by the Geological Survey, the agency also generated other documents shedding light on the nature of the Upper Salt River and Tonto Creek prior to and at the time of Arizona Statehood.

For example, in an unpublished report prepared for the U.S. Geological Survey, E.C. Murphy discussed potential hydroelectric power sites within Arizona just three years after Statehood. Murphy's report was done to conform with provisions of the 1910 *Enabling Act* permitting Arizona to organize a State government and join the Union – a law that prevented Arizona from selecting parcels valuable as hydroelectric power sites as part of acreage granted to the new State by Congress.⁸² Murphy's report was the result of an investigation to locate those lands so the United States could retain them.

Part 3 of Murphy's report covered the Salt River and what Murphy characterized as "smaller tributaries" of the Gila.⁸³ Murphy wrote that over a twenty-six-year period, the annual runoff of the Salt River had ranged from 153,400 acre-feet to 3,226,000 acre-feet, indicating a highly variable stream. He also observed that while the mean flow was 770,500 acre-feet, its fluctuation was so great that in some years the flow had been as little as one-fifth the mean. In others, the flow was more than four times the mean.⁸⁴

⁸²See Section 28 of *An Act to Enable the People of New Mexico to Form a Constitution and State Government and Be Admitted to the Union on an Equal Footing with the Original States; and to Enable the People of Arizona to Form a Constitution and State Government and Be Admitted into the Union on an Equal Footing with the Original States* (also known as the *Enabling Act*), 36 Stat. 557 (1910).

⁸³Each main part to Murphy's report was re-paginated beginning with page one. Therefore, all citations to his report 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.

⁸⁴E.C. Murphy, "Water Power Utilization in Arizona," April 1915, Part 3, pp. 2, 8, Salt River Project Archives, Phoenix, Arizona.

B. RECORDS OF THE U.S. RECLAMATION SERVICE

Much like the Geological Survey, the U.S. Reclamation Service created records describing the Upper Salt River and/or Tonto Creek before and around the time of Statehood. Following Congress's enactment of the *Reclamation Act* in 1902, 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 1902 law, the Reclamation Service 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. The Salt River Project called for the construction of Roosevelt Dam, the principal storage facility for the Project, and Granite Reef Dam, the main diverting feature along the Salt River. In addition, the Reclamation Service also purchased and renovated some of the existing irrigation canals in the Phoenix area as well as built new ones. Since much of this work took place between 1904 (when construction work began) and 1911 (when Roosevelt Dam was completed), the Reclamation Service's records are extremely useful for determining the nature of the Salt River and Tonto Creek around the time of Arizona's Statehood.

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

Like the Geological Survey, the Reclamation Service also issued *Annual Reports*. These described the Reclamation Service's activities, and they contain valuable descriptions of the Salt River both above and below Granite Reef Dam. The *First Annual Report of the Reclamation Service* (1903) commented that

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

Because of these characteristics, the *First Annual Report of the Reclamation Service* indicated that the Reclamation Service was planning the Salt River Project to store the Salt River's irregular flows behind Roosevelt Dam at the confluence of the Salt River and Tonto Creek.⁸⁵ While the *Report's* description of the variable flows of the Salt helped explain why storage of the stream's supplies was necessary, it gave no indication that navigation interests would be adversely affected by the Salt River Project's storage reservoir, its diversion dam, or the removal from the stream of large quantities of water for irrigation.

By the time the *Third Annual Report of the Reclamation Service* (1905) was published, work on the Salt River Project was well underway, and progress was detailed in the *Report*. In reviewing problems, the *Report* indicated that studies were being undertaken to determine the sources of salt in the stream and to lessen the impact of that substance on irrigation. The isolated location of Roosevelt Dam – which lay outside Phoenix above a long canyon – had also caused difficulties in getting supplies to the construction site. In the *Report*, Reclamation Service Supervising Engineer Louis C. Hill observed that “[f]ew reservoirs have been constructed in locations where the natural conditions are so extremely favorable and transportation facilities so meager.” Hill added that the construction of a road from Phoenix to the dam site had reduced rates for hauling supplies and that “[i]ndirectly, it has opened up a country hitherto absolutely inaccessible.”⁸⁶

While issues such as the river's salt content and the difficulties of carrying supplies to the Roosevelt Dam site were thoroughly addressed in the *Third Annual Report of the Reclamation Service*, this synopsis of operations gave no indication that any problems existed due to the Salt

⁸⁵ *First Annual Report of the Reclamation Service, from June 17 to December 1, 1902* (Washington D.C.: U.S. Government Printing Office, 1903), pp. 75-76.

⁸⁶ *Third Annual Report of the Reclamation Service, 1903-4* (Washington D.C.: U.S. Government Printing Office, 1905), pp. 140-141.

River Project's impact on the Salt River's navigability. Indeed, the building of the road from Phoenix to Roosevelt underscored the inability of the river to carry supplies or people.

The *Fifth Annual Report of the Reclamation Service* (1906) carried a discussion of the beginning of construction on Granite Reef Dam, noting that the "dam will ultimately divert all the water used on both sides of the river and will save the heavy maintenance charges of the six temporary structures now used." There was no suggestion that Granite Reef Dam or any of the diversion dams it would replace might cause any difficulty for navigation interests on the Salt River.⁸⁷

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 Salt River as highly erratic and not capable of being used for commercial navigation. While the Reclamation Service's files contain thousands of documents describing the Salt River and the construction of the Salt River Project (none of which indicate that the river was a reliable means of navigation), representative examples are provided here.

On September 4, 1902, Judge Joseph H. Kibbey (who had written in 1892 the earliest water rights adjudication decision involving the Salt River – *M. Wormser, et al. v. The Salt River Valley Canal Company* – to be discussed later in this chapter) submitted to a committee of concerned Phoenix-area citizens a report entitled "Suggestions of Judge Jos. H. Kibbey for Plan to Secure Government Aid for Construction of Tonto Reservoir." Drafted only three months after Congress had approved the *Reclamation Act*, Kibbey's report examined the major problems associated with obtaining U.S. Government assistance under the terms of the new law for building Roosevelt Dam. Among the points Kibbey discussed were how to resolve questions of

⁸⁷ *Fifth Annual Report of the Reclamation Service, 1906* (Washington D.C.: U.S. Government Printing Office, 1906), p. 90.

water rights, how irrigators should organize themselves to deal with the Reclamation Service, who would own and operate the canal systems, how repayments for construction would be handled, and a multitude of other concerns. Despite the report's comprehensive nature, Judge Kibbey – whose expertise in Salt River matters was clear by his ruling in the *Wormser* case – gave no indication that addressing the needs of commercial navigation interests would be necessary if the dam and other related structures were built.⁸⁸

The efforts by Kibbey and other concerned Phoenix citizens paid off, and shortly after Kibbey had submitted his paper, the Reclamation Service approved the construction of what eventually became known as the Salt River Project. On May 4, 1903, as initial planning for Roosevelt Dam and other project features went forward, Reclamation Service Consulting Engineer George F. Wisner wrote to Chief Engineer Frederick H. Newell regarding problems that would have to be addressed. Wisner observed that one difficulty was that the reservoir would gradually fill with silt. Seeing that one solution was to raise the dam, Wisner cautioned against building it too tall because of insufficient water to fill the reservoir every year. Wisner also noted that another issue the Government might face in building the dam was liability for damages during the construction phase. Nevertheless, Wisner made no mention of any problems that might arise by interfering with the navigability of the Salt River.⁸⁹

Also indicating that the Salt River was not used for commercial navigation was a September 3, 1905, letter written by Reclamation Service Engineer Louis Hill to Arthur P. Davis,

⁸⁸ Joseph H. Kibbey, "Suggestions of Judge Jos. H. Kibbey for Plan to Secure Government Aid for Construction of Tonto Reservoir Submitted September 4, 1902, to Conference Committee at Phoenix, Arizona," file 27, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch – Rocky Mountain Region, Denver, Colorado.

⁸⁹ George F. Wisner to F.H. Newell, May 4, 1903, in "Salt River Project, Consulting Engineers Reports, January 1, 1913 – December 31, 1913," General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch – Rocky Mountain Region, Denver, Colorado.

then an assistant to Reclamation Service Chief Engineer Frederick Newell. Describing progress on the construction of Roosevelt Dam, Hill stated that freighting operations along the road from Phoenix to Roosevelt (a portion of which was below Granite Reef Dam) were already taking place:

It may interest you to know something of the traffic passing over the Roosevelt Road even now, before the contractor has fairly begun hauling in his material and before the oil outfit has begun to deliver even one-half the amount which is demanded from them when we are running at full blast. The amount of freight hauled daily and delivered to the United States, . . . to the people living in Roosevelt, those up the Salt River Valley to the Tonto Valley and further on toward Holbrook demands a daily payment to the freighters of at least \$750. A low estimate of the value of this freight is \$250,000 a month. It hardly seems possible that that much material and provision is used in the district tributary to the road.⁹⁰

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

Another unpublished Reclamation Service document revealing the nature of the Salt River around the time Roosevelt Dam was being built is a 1905 report by Gerard H. Matthes. Entitled "Recent Conditions in Salt River Valley, Arizona," the report described the "unusual meteorological conditions which have prevailed throughout the United States during the early part of the present year." In particular, Matthes reviewed how that weather had affected the Salt River Valley. Matthes noted that there had been unusually high precipitation in the winter and spring months of 1903, and while the rain had been an advantage to cattle ranchers on high

⁹⁰ Louis C. Hill to A.P. Davis, Sept. 3, 1905, in "Salt River Project, Consulting Engineers Reports, January 1, 1913 – December 31, 1913," General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch – Rocky Mountain Region, Denver, Colorado.

ground, it had caused serious flooding throughout Arizona, especially in the Salt River Valley.

Matthes wrote that

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

Matthes further observed that the flooding had repeatedly destroyed railroad lines and bridges into and out of Phoenix, and for a time there had been no available bridge spanning the Salt River “for many hundred miles either up or down the river[.]” Matthes also pointed out that there had been considerable damage to the irrigation systems in the Salt Valley and that the Salt River bed had shifted due to the flooding. Despite offering detailed descriptions of the damages wrought by the flooding and the difficulties local residents faced in rebuilding diversion dams, bridges, buildings, and other structures, Matthes made no mention of any impact on navigation on the Salt, either by the rebuilding of irrigation works or by the flooding and massive channel changes.⁹¹

Yet another example of the Reclamation Service expressing its concern over issues that might affect the construction of the Salt River Project can be seen in the agency’s interest in *Patrick T. Hurley v. Charles F. Abbott, et al.*, a lawsuit commenced in 1905 to adjudicate the water rights of all irrigators in the Salt River Valley. As the litigation moved forward, U.S. Government officials were quite anxious about the lawsuit’s conclusion because the outcome could have considerable impact on water to be stored at Roosevelt Reservoir on the Upper Salt River at that stream’s confluence with Tonto Creek. Demonstrating the U.S. Government’s

⁹¹ Gerard H. Matthes, “Recent Conditions in Salt River Valley, Arizona,” Dec. 1905, in “Salt River Project, Consulting Engineers Reports, January 1, 1913 – December 31, 1913,” General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

worries, on February 28, 1907, Morris Bien, Acting Chief Engineer of the U.S. Reclamation Service and an attorney for that agency, wrote Benjamin A. Fowler, President of the Salt River Valley Water Users' Association. Bien told Fowler that the "importance of this matter [*Hurley v. Abbott*] is manifest and is undoubtedly appreciated by the water users association and many of the people in the valley." Bien asked Fowler for the status of the litigation, and he added that the "matter is of extreme importance to the Reclamation Service as the progress in this case must guide its future policy." Observing that the "Government must be protected against any claims to the use of water stored in the Roosevelt Reservoir[,]" Bien opined that it might be necessary to keep the gates of Roosevelt Dam open and not store water until the court case was resolved. While Bien was clearly worried about claims for water that might be stored at Roosevelt, he gave no indication that any of those claims might be to keep the Salt River navigable.⁹²

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

⁹² Morris Bien to B.A. Fowler, Feb. 28, 1907, file 118, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

that all parties' interests in the Salt River needed to be resolved, he gave no indication (nor did the Reclamation Service) that any of those concerned parties were commercial navigation interests.⁹³

The issue of developing hydroelectric power at Roosevelt Dam and elsewhere also demonstrated a lack of navigability of the Salt River. In 1911 as construction on Roosevelt Dam and the Salt River Project neared completion, controversy arose over whether hydroelectric power should be developed at the dam and at drops in the canals, and if so, how much. Evidently, proponents of a permanent source of hydroelectric power believed the income from this energy could be used to offset the costs of the dam and project. Nevertheless, the principal electrical engineer for the Reclamation Service at the Salt River Project, O.H. Ensign, urged restraint in the creation of more power than just the amount necessary for pumping purposes. Ensign told Reclamation Service Director Frederick Newell that generating constant hydroelectric power through continuous releases of water might not be possible if sufficient water for irrigation purposes late in the summer months were to be kept at the reservoir. Ensign, however, gave no indication that navigational interests might support steadier flows of water in the Salt River.⁹⁴

One final example of Reclamation Service unpublished documents illustrating that the agency did not consider the Salt River to be navigable is the 1916 report, "Final History, Salt River Project, Arizona." This synopsis covered virtually all aspects of the history of the Salt

⁹³ Louis C. Hill to the Director, U.S. Reclamation Service, June 11, 1907, file 118, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

⁹⁴ O.H. Ensign to the Director, U.S. Reclamation Service, Feb. 7, 1911, in "Salt River Project, Consulting Engineer Reports, January 1, 1907 – December 31, 1912," General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado.

River Project, and it included descriptions of private Salt River Valley canals in existence prior to the construction of the federal project as well as roads to Roosevelt Reservoir and Granite Reef Dam.

Under the section of this report dealing with roads, the report noted that the “inaccessibility of the Roosevelt Reservoir” had forced the construction of roads to carry freight and lumber to the dam construction site. One of these, the Mesa-Roosevelt (Apache Trail or Tonto) road, had been constructed beginning in 1903, and it had reduced freight expenses considerably by making it possible not to haul everything via Globe, Arizona, and then to the reservoir site. The report noted that building the road had been exceptionally difficult due to the steep mountainous terrain, and in some cases workers had to use lifelines to carry on work. (Photographs of this road appear later in this report.) Moreover, once the road had been completed in 1905, it had washed out frequently, especially in the canyon just below Roosevelt Dam. Nevertheless, despite these extreme difficulties in hauling materials from Phoenix to the dam locale, the report made no indication that the river might have been used as an alternative means of transportation.⁹⁵

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

⁹⁵ “Salt River Project, Final History (to 1916),” Engineering and Research Center Project Histories, 1911-1991, box 142, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch – Rocky Mountain Region, Denver, Colorado.

[a]ll material and supplies came by way of Mesa, the nearest railroad connection, and were hauled by wagon from that point to the dam. . . . A daily stage from Mesa carried mail and passengers.⁹⁶

Again, as had been the case with carrying supplies to Roosevelt, the Reclamation Service apparently never considered using the river to transport goods or people to Granite Reef Dam.

C. RECORDS OF THE U.S. DEPARTMENT OF AGRICULTURE

Long before Congress passed the *Reclamation Act* in 1902, the U.S. Government had been assisting farmers in the West through the Department of Agriculture. That agency's Division of Soils and the Office of Experiment Stations generated a variety of published and unpublished records characterizing the nature of the Salt River, a few typical examples of which will be discussed here. These records further substantiate those generated by other federal agencies indicating that the Upper Salt River and Tonto Creek were not navigable at the time of Arizona's Statehood in 1912.

1. Published Records of the U.S. Department of Agriculture

Details about the nature of the Salt River can be found in Department of Agriculture materials in Alfred J. McClatchie's *Utilizing Our Water Supply*, published by the Department of Agriculture's Office of Experiment Stations in 1902. Although covering water supplies throughout Arizona, the report chiefly dealt with the Salt River. Describing that stream, McClatchie wrote:

The Salt River, like all streams having a watershed with many steep slopes, is subject to great variations in its flow . . . [and] conditions combine to make a great difference between the winter and the summer flow. After heavy rains in the mountains, especially during the winter, the Salt River is sometimes unfordable for weeks, while during the hot, dry weather of summer it is sometimes reduced to

⁹⁶ "Salt River Project, Final History (to 1916)," Engineering and Research Center Project Histories, 1911-1991, box 142, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch – Rocky Mountain Region, Denver, Colorado.

a mere brook, the flow during the winter months of some years being ten to twenty times what it is during some months of the following summer.⁹⁷

2. Unpublished Records of the U.S. Department of Agriculture

Within a year of publishing *Utilizing Our Water Supply*, McClatchie reiterated many of the points he had made in that document in a letter to Charles D. Walcott, Director of the U.S. Geological Survey. Writing on March 30, 1903, McClatchie urged the U.S. Government to help irrigate the Salt River Valley more fully. As one of the active local proponents of having the U.S. Reclamation Service build Roosevelt Dam, McClatchie restated in his letter many of the points made in *Utilizing Our Water Supply*. In addition, he noted that

[t]his desirable condition of our valley that I feel would be secured by water storage I desire to see effected by such means and upon such terms as are conducive to the best interests of the farmers, as are in accordance with justice to all concerned, and as are in harmony with the policy and welfare of our government.⁹⁸

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

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

[t]he great fluctuation of our present water-supply must be understood and taken into consideration, in planning for water storage. As shown in the bulletin before referred to [*Utilizing Our Water Supply*], the flow during the winter months of some years is ten to twenty times what it is during part of the following summer; and the flow during any one month may be five to fifteen times as great one year as another. The amount diverted and used varies somewhat less than this, the relation of the greatest amount diverted during any one month of the past eight

⁹⁷ Alfred J. McClatchie, *Utilizing Our Water Supply* (Washington D.C.: U.S. Government Printing Office, 1902), pp. 62-63.

⁹⁸ Alfred J. McClatchie to Charles D. Walcott, March 30, 1903, file 27, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch – Rocky Mountain Region, Denver, Colorado.

years to the smallest amount diverted being approximately as ten to one, and the greatest difference in the amount diverted during any two months of one calendar year being as five to one. However, the difference in the amounts diverted during two different weeks of the same year may be as great as twenty-five to one. That is, during some summer week a farmer may receive but one twenty-fifth as much water as he had during a week of the previous winter.⁹⁹

McClatchie gave no suggestion that navigation interests might be adversely affected by the river's erratic flow or even the potential construction of a new, massive storage reservoir by the U.S. Government.

D. LEGISLATIVE ACTION AND LITIGATION

Officials in Arizona, representing the courts as well as the lawmakers, agreed with the engineers that the Salt River was useless for the purposes of navigation. The perception that the Salt River was not navigable was held unanimously by such State or Territorial authorities.

1. The Arizona Territorial Legislature's "Memorial" to Congress

For example, the Arizona Territorial Legislature, meeting in its second session, passed on December 28, 1865, a "Memorial Asking Congress for an Appropriation to Improve the Navigation of the Colorado River." Seeking \$150,000 to remove obstacles such as sand bars, snags, boulders, and other obstructions in the Colorado's bed, the memorial declared that "the Colorado River is the only navigable water in this Territory[.]" The "Memorial" also noted that if the requested funds permitted the improvements to be carried out, the Colorado River would

⁹⁹ Alfred J. McClatchie to Charles D. Walcott, March 30, 1903, file 27, General Administrative and Project Records, 1902-1919, Records of the U.S. Bureau of Reclamation, Record Group 115, U.S. National Archives Branch – Rocky Mountain Region, Denver, Colorado.

be navigable as far as Callville, Nevada, where a wagon road would connect the Colorado River to Salt Lake City.¹⁰⁰

2. *M. Wormser, et al., v. The Salt River Valley Canal Company, et al.*

Less than thirty years after the Arizona Territorial Legislature had declared the Colorado River to be the only navigable stream in the Territory, the courts in the Territory also began to look at the Salt River Valley's resources. On March 31, 1892, Joseph H. Kibbey, judge of the Second Judicial District, handed down his opinion in *M. Wormser, et al., v. The Salt River Valley Canal Company, et al.* The decision adjudicated the water rights of various irrigators on the Salt River. Before turning to a discussion of relevant law and findings of fact in the case, Judge Kibbey first discussed the history of water use in the Salt River Valley that led to the litigation. Kibbey wrote that the soil in the Salt River Valley was very fertile when supplied with water, but the climate's aridity made irrigation necessary. The watershed of the Salt River, he observed, was

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

Kibbey then discussed the history of the various canals established in the valley, and he confirmed the plaintiffs' statement that the Salt River was

a natural *unnavigable stream* rising in the mountains in the eastern part of the territory and running thence in a westerly direction to its junction with the Gila river in Maricopa county. [Emphasis added.]¹⁰¹

¹⁰⁰ "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.

¹⁰¹ *M. Wormser, et al. v. The Salt Valley Canal Co., et al.*, March 31, 1892, No. 708, Maricopa County District Court, Phoenix, Arizona. Quotes at pp. 1, 5, 9.

The plaintiffs asked Kibbey to force the defendants to remove their dam and not interfere with the flow of the Salt River. The complaint was later amended to change some of the plaintiffs to defendants and to modify some of the complaints. The case went to trial in March 1890 and final arguments took place in February 1891. The trial resulted in 6,000 pages of evidence. Following a discussion of the relevant law, Kibbey presented his findings of fact regarding the relative rights of various appropriators.¹⁰²

The significance of this lawsuit is fourfold: First, Judge Kibbey acknowledged the widely varying flows of the Salt River; second, the plaintiffs complained that the Arizona Canal had begun diverting all of the water in the river during dry seasons, leaving none for downstream canals; third, the construction of the Arizona Dam across the river had not resulted in any objections from navigation interests, nor were any such entities named as parties in the suit; and fourth, the plaintiffs' declaration that the Salt River was non-navigable remained uncontested. All of these points suggest that the larger Salt River Valley community did not consider the Salt to be navigable.¹⁰³

3. The "Kent Decree"

Approximately twenty years later, another critical court decision was handed down in the Territory of Arizona which supported the same conclusion regarding the nature of the Salt River as the *Wormser* decision. On March 1, 1910, Judge Edward Kent of the Third Judicial District Court of the Territory of Arizona issued the Kent Decree in *Patrick T. Hurley v. Charles F. Abbott, et al.* In his decree, Kent reviewed the principles of prior appropriation in Arizona,

¹⁰² *M. Wormser, et al. v. The Salt Valley Canal Co., et al.*, March 31, 1892, No. 708, Maricopa County District Court, Phoenix, Arizona.

¹⁰³ *M. Wormser, et al. v. The Salt Valley Canal Co., et al.*, March 31, 1892, No. 708, Maricopa County District Court, Phoenix, Arizona.

observing that those principles applied to non-navigable streams and that they therefore were relevant to the Salt River litigation.¹⁰⁴

The significance of the decree rendered in *Hurley v. Abbott* is similar to Judge Kibbey's decision in the *Wormser* case – Kent had declared the Salt River to be non-navigable. Furthermore, Kent wrote about the wide fluctuations in flow, claiming the stream was “unpredictable.” Additionally, Kent discussed the then-recent construction of Granite Reef Dam across the river, but he never opined this type of structure would be an impediment to navigation. Similarly, there are no indications that navigational interests played any role in this lawsuit.¹⁰⁵

E. OTHER MISCELLANEOUS DOCUMENTS

Speeches given by two prominent Arizona personalities shortly after the beginning of the twentieth century support other evidence that the Salt River was not navigable. Joseph H. Kibbey, judge in the *Wormser* case, spoke in 1907 to the Fifteenth National Irrigation Congress in Sacramento, California. In his speech, Kibbey focused mainly on the implementation of the *Reclamation Act* and the disputes that were arising as a result of that law. Predictably, Kibbey used the situation in the Salt River Valley as an example. In discussing the fight over the waters of the Salt River, Kibbey stated that

¹⁰⁴ *Patrick T. Hurley v. Charles F. Abbott, et al.*, March 1, 1903, No. 4564, Third Judicial District Court of the Territory of Arizona, in and for the County of Maricopa. In a much more recent lawsuit, filed on July 17, 1972, in U.S. District Court, another judge confirmed the *Wormser* and *Hurley* opinions on non-navigability of the Salt. In this case, the Salt River Pima-Maricopa Indian Community had sued the Arizona Sand and Rock Company and several others seeking recognition that the bed of the Salt River (in which the defendants were mining sand and gravel) was actually owned by the Indians. The plaintiffs sought damages and removal of the defendants, claiming that under the executive order which had created the Indians' reservation (June 14, 1879), the bed of the river to the middle of the channel was considered part of their land. As part of the order consolidating the suits, Judge W.D. Murray declared: “The Salt River is not now and never has been a navigable river.” See p. 1068 in “In the Matter of the Navigability of the Salt River [From Granite Reef Dam to the Gila River Confluence], Admin. Docket No. 94-1, Before the Arizona Navigable Streambed Adjudication Commission.”

¹⁰⁵ *Patrick T. Hurley v. Charles F. Abbott, et al.*, March 1, 1903, No. 4564, Third Judicial District Court of the Territory of Arizona, in and for the County of Maricopa.

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

As Kibbey noted, the erratic nature of the Salt River was known to all residents of the valley, including even the “casual observer.”¹⁰⁶

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

¹⁰⁶ Joseph H. Kibbey, “Address of Hon. Joseph H. Kibbey Delivered Before 15th National Irrigation Congress at Sacramento, CA.,” Sept. 4, 1907, Water Resources Center Archives, Berkeley, California.

therefore, was money to curb flooding on his State's unpredictable streams, including the non-navigable Salt.¹⁰⁷

F. MORE RECENT HISTORICAL STUDIES

More recent studies confirm historical documents about the nature of the Salt River. A Master's thesis from the University of Arizona supports these conclusions about the erratic nature of the Salt River. John Porcello's 1988 thesis studied the area from the confluence of the Salt and the Gila rivers to just above the Salt's confluence with the Verde River to determine groundwater presence. Although focusing on underground supplies, the study was augmented by important historical data about the Salt River's surface flow.

Porcello described the Gila and Salt Rivers as perennial streams "only in reaches upstream of the study area, [and] have been completely diverted by extensive canal systems serving agricultural and municipal water demands since the middle of the 19th century." Adding that "[b]y the 1890s, water use by farms and small towns had resulted in the diversion of the entire flows of both the Salt and Gila Rivers," he noted that "[u]nregulated flows impacting the East Valley were highly seasonal prior to 1910, more than half the annual flow occurring between October and April and the remainder resulting from spring discharges and flash floods during the summer months."¹⁰⁸

Karen Smith, another recent historian of the Salt River, reached the same conclusion as other, earlier observers of the stream. In her doctoral dissertation which was later published as

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.

¹⁰⁸ John Joseph Porcello, "Pre-Development Hydrologic Conditions of the Salt River Indian Reservation, East Salt River Valley, Central Arizona, With an Emphasis on the Ground-Water Flow Regime," (M.S. thesis, University of Arizona, 1988), pp. 14, 21, 30.

The Magnificent Experiment, Building the Salt River Reclamation Project, 1890-1917 (1986),

Smith described the Salt River Valley:

On the face of it, the growth of metropolitan Phoenix from a dusty village located near the Salt River to the ninth-largest city in the United States has been something of an anomaly. There was no major railroad connection to Phoenix until the 1920s, *no harbor or navigable river* to spawn commerce, and no major trail or crossroads to lure tired travelers to stop. [Emphasis added.]¹⁰⁹

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

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

¹⁰⁹ Karen L. Smith, *The Magnificent Experiment, Building the Salt River Reclamation Project, 1890-1917* (Tucson: University of Arizona Press, 1986), p. ix.

CHAPTER IV: NEWSPAPER ACCOUNTS AND PHOTOGRAPHS OF THE UPPER SALT RIVER AND TONTO CREEK

Newspaper reports offer some of the most frequent descriptions of the Upper Salt River in the years leading up to Arizona's Statehood in 1912. Understandably, with Tonto Creek lying considerably out of the major area of settlement in the late nineteenth and early twentieth centuries, little was written in the Phoenix-area press about this stream. Yet the Salt River was the focus of considerable newspaper discussion, both below and above Granite Reef Dam.

Similarly, the prominence of the Salt River and related dams and irrigation works were the subject of a considerable amount of photography around the beginning of the twentieth century. Because the photographic history of the Upper Salt corresponds well with newspaper accounts of that stream (and Tonto Creek under Roosevelt Lake), this Chapter will discuss press accounts of the two streams in conjunction with photographic illustration (although the photos are not necessarily from newspaper accounts).

To understand the significance of press accounts of the Salt River, it is useful to examine some background information on nineteenth and early twentieth century newspapers in the American West. Such newspapers were among their respective communities' biggest boosters, not only due to civic pride, but also to attract settlers to growing towns. Articles in out-of-town papers which provided positive accounts of visits to a particular community were often reprinted verbatim by the latter town's press, and residents who commented on their location's virtues while away received considerable attention by the home-town press if those remarks became known. As enthusiastic promoters of their communities, local papers frequently printed long articles extolling their respective areas' many advantages not only for their own readership, but also for readers in other more distant places, to which copies of the paper would be sent to attract newcomers.

Given the booster nature of the western press, it is not surprising that the Salt River, as the principal source of irrigation water for the Phoenix area, was given substantial newspaper space on many occasions and was touted as one of the region's many blessings, particularly by papers in the Phoenix area. Although the river was praised as the source of water for the many farms, accounts of reliable commercial navigation on the stream were conspicuously absent from the long list of many benefits the Phoenix area had to offer. This does not mean that there were no accounts of boats on the Salt River – indeed, such stories appeared on a variety of occasions. Nevertheless, the articles that did cover the presence of boating on the Salt River indicate that such uses were infrequent.

The Phoenix-area press also carried a wide variety of other stories that shed light on the nature of the stream in addition to accounts of infrequent attempts to use boats on the river. These include stories about dams and irrigation and articles about forms of non-water transportation in the Salt River Valley. There were, of course, many stories about flooding, but that topic has been adequately dealt with elsewhere in this report.

Among the earlier stories to appear in the Phoenix press regarding the Salt River above Granite Reef Dam was an article that appeared in the *Arizona Gazette* on June 5, 1885, about an exploration down the Upper Salt that had been attempted by boat. The newspaper reported that based on the party's experience, it appeared that logs could be floated to Phoenix. Nevertheless, the following day the *Gazette* offered a more detailed description of the journey making it clear just how dangerous the trip down the Salt had been. Noting that the explorers' craft had been upset once and that the current was so strong there was no driftwood along the stream, the paper

suggested that the trip would have been considered foolhardy had it not been for a “laudable purpose.”¹¹⁰

By the turn of the century, Phoenix-area newspapers began to report on the proposal to construct a dam (initially called Tonto Dam) on the Salt River where the Reclamation Service eventually constructed Roosevelt Dam. Because Arizona was a territory at the time and the dam was to be funded by a bond issue tied to Maricopa County, proponents of the massive reservoir pressed Congress to pass an act allowing the county to make this monetary commitment. The *Arizona Republican* reported on March 19, 1902, on the debate then taking place on this topic, noting that the size of the bond issue was causing some opposition to the dam’s financing.¹¹¹

Although opponents of the reservoir scheme fought it on fiscal grounds, there was no resistance by parties involved in commercial navigation on the Salt River. Had boating interests existed along the Upper Salt River in the location proposed for the reservoir, they clearly would have had cause to object to such a dam because the narrowness of the canyon at the dam site would not have permitted alternate water routes around that locale. The following photographs, taken before construction began on Roosevelt Dam, demonstrate not only why boating interests would have objected to blocking the river (had such navigation concerns existed), but the photos also illustrate the scale and difficulty of the proposed undertaking.

¹¹⁰ [No title], *Arizona Gazette*, June 5, 1885; “Valuable Discoveries,” *ibid.*, June 6, 1885.

¹¹¹ “South Side Objections,” *Arizona Republican*, March 19, 1902. See also articles appearing in the *Republican* over the next few months.



Photograph of "View of Upper Box Canyon, Tonto Basin, Taken from Point Looking Down River," [circa 1902], Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of "Canyon just below Damsite, Showing Damsite," January 16, 1904, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of "Roosevelt Damsite Looking Downstream," March 6, 1906, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

When Congress passed the *Reclamation Act* in June 1902, citizens around Phoenix shifted their reservoir efforts to seeking to have that facility built by the U.S. Government under the terms of the new law. The Phoenix press carried a multitude of stories on a near daily basis about the growing effort around Phoenix to have the reservoir at the Tonto Basin built by the Government. While the newspapers also reported that not all parties agreed on the Government's role, the existing resistance was based largely on the unfounded claim that the individuals would lose control of their water rights. None of the opposition, however, stemmed

from commercial navigation interests contending that the dam might interfere with their enterprises.¹¹²

To support the effort for federal construction of Roosevelt Dam, beginning in August 1902 citizens in Phoenix held a series of mass meetings. According to the local press, the meetings were heavily attended, and eventually a committee representing Phoenix-area canal companies, communities in the Salt Valley, and other interests was organized to work with the U.S. Government. The mass meetings and those of the committee were covered extensively by the Phoenix press, but the newspapers made no mention of any objections to damming the Salt River either at the Roosevelt site or at the Granite Reef Dam locale voiced by commercial boating interests.¹¹³

Another action being considered by local residents to back the movement for the massive Salt River reservoir was the possibility of bringing a general adjudication lawsuit to settle all water rights along the Salt and its tributaries. Apparently the belief was that such litigation would simplify the U.S. Government's dealings with water users in establishing repayment contracts and related financial matters. For example, on July 6, 1904, the *Arizona Gazette* reported that the Salt River Valley Water Users' Association had voted to initiate litigation to determine the relative rights of all water users whose supplies came from either the Salt or Verde rivers. The article noted that the suit would ultimately involve several thousand people, but press accounts gave no indication that commercial navigational interests on either stream would play a role.¹¹⁴

¹¹² "The Reservoir Campaign," *Arizona Republican*, July 20, 1902. See also articles in the *Arizona Gazette*, Aug. 1, 2, 3, 5, 9, 10, 1902.

¹¹³ See articles in the *Arizona Gazette*, Aug. 2, 3, 5, 9, 10, 1902.

¹¹⁴ "To Establish Priority Claims," *Arizona Gazette*, July 6, 1904.

Two years later, the plan to settle water-related legal issues was still being discussed by area residents. The *Gazette* reported on May 9, 1906, that a conference was being held that day for all the attorneys in Phoenix to settle what the paper termed the “legal side of the water question in this valley.” The article pointed out that a committee of sixteen residents had been appointed the previous year when *Hurley v. Abbott* had been filed to draft a proposal to settle the case, and that plan had been submitted to the court. Nevertheless, the *Gazette* noted, not everyone agreed with the proposal, and the meeting of attorneys was being called to try to resolve the disputes. The article gave no indication that navigation was of any concern.¹¹⁵

The Reclamation Service officially took no active position in the *Hurley v. Abbott* suit. Nonetheless, U.S. Government officials supported the attempt to resolve all rights along the Salt River as a means to facilitate the construction and operation of the Salt River Project. On July 31, 1906, for instance, the *Phoenix Enterprise* reported that the Reclamation Service backed the *Hurley v. Abbott* litigation as a means to clear up water rights in the Salt River Valley. As the paper explained, Reclamation Service officials Morris Bien and Arthur P. Davis, “while they both stated that they have nothing to do with the method, one of the principal agreements between the farmers and the government was that they [the farmers] would settle every legal question before the government could expend money for a storage reservoir.” There was no mention in the *Enterprise*’s story, however, that any of the legal problems involved commercial navigation of the Salt River.¹¹⁶

Newspaper articles discussing roads and railroads underscored that transportation was conducted overland and not on the Salt River in the years around Arizona’s Statehood. For

¹¹⁵ “Phoenix Attorneys in Conference,” *Arizona Gazette*, May 9, 1906.

¹¹⁶ “Approve of Water Suit,” *Phoenix Enterprise*, July 31, 1906.

instance, on January 19, 1895, the *Phoenix Daily Herald* published a lengthy booster article on the advantages of the Phoenix area. Written in a question-and-answer format, the article contained nearly a hundred detailed questions and answers about the city, particularly about irrigation and farming. The answers were designed to attract settlers and contained considerable information about commerce in the area, and the discussion regarding transportation noted that there were local streetcars as well as two principal railroads. Nevertheless, no mention was made of commerce or people being carried on the Salt River – a topic that certainly would have warranted comment had the stream been used for transportation.¹¹⁷

The Salt River's potential use for transportation also was ignored in an *Arizona Republican* article dated June 26, 1902. In that account, the *Republican* reported that the Secretary of the Interior would probably order the construction of the San Carlos Reservoir on the Gila River (upstream from the confluence with the Salt) under the terms of the newly-enacted *Reclamation Act*. The paper added that “the construction of that will be of advantage to Phoenix, since it will result in the development of a considerable agricultural area in Pinal County, which will be brought into connection with this city by the Phoenix and Eastern Railroad.” While floating goods down the Gila and then boating them up the Salt also would have been possible had those streams been navigable, the paper completely disregarded this prospect, discussing only the use of the railroad, and thus illustrating the difficulty in using those rivers for transportation.¹¹⁸

As plans for building Roosevelt Dam (then called Tonto Dam) began to take more solid form, the press carried numerous stories about how freight and people would be carried to the

¹¹⁷ “The Salt River Valley,” *Phoenix Daily Herald*, Jan. 19, 1895.

¹¹⁸ [No title], *Arizona Republican*, June 26, 1902.

construction site. While some of these stories related specifically to areas above Granite Reef Dam, most dealt with the entire distance of the river from Phoenix to Roosevelt. In mid-August 1903, for example, the *Phoenix Enterprise* wrote that entrepreneurs were considering building a trolley to the dam location to avoid the lengthy road via Globe to Roosevelt. The paper added that

[t]he details of this scheme, however, are not yet worked out, but that there will be a trolley line to the reservoir is almost an assured fact. Much of the cost of this line can be saved in the difference between wagon and [trolley] car freight.¹¹⁹

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

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

The proposed wagon road to Phoenix is not seriously talked of for the reason that it is impracticable. It would cost \$150,000, an amount out of all proportion to the benefit that would be derived from it, and the farmers would have to pay for it. Besides, a wagon road from the mouth of Tonto [Creek] to Phoenix available for freighting is impossible. Globe will handle all the freight.¹²⁰

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

Regardless of the *Gazette*'s gloomy assessment that a road from Phoenix to the reservoir location was not possible, five days after the article had appeared, the *Arizona Republican* reported that surveys were already underway for such a road. Demonstrating that the Salt River

¹¹⁹ [No title], *Phoenix Enterprise*, Aug. 14, 1903.

¹²⁰ [No title], *Arizona Gazette*, Aug. 25, 1903.

was not considered a viable route for taking goods and equipment to the reservoir site, the newspaper made it clear that the road was for hauling supplies:

This road of course is designed at present only for the hauling of telephone poles and wire and the supplies for the men engaged in construction work. The telephone line is the most pressing need and is to be rushed to completion as soon as possible. If it shall transpire that the close acquaintance with that route will follow the building of the line proves it to be a better one than any other suggested, or proves that it can with less expenditure of money than on any other be made into a good freight road, it is likely it will be made into a permanent highway and graded for freight handling.¹²¹

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

All things considered we would prefer that the freight came this way. If we could have a road whereby we could make the distance in one day with a buggy and two days with a wagon, it would be a great improvement over the inconvenience we have to endure by going by way of Globe.¹²²

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

Fuel oil will be the greatest amount of freight that will have to be handled, in fact, there will be about twice as much of this as anything else, to be hauled. It will take about 15,000,000 pounds of oil, and the cost of hauling from Mesa will be about two cents a pound. Then there will be about 100 tons of steel and 200 tons of other material.¹²³

¹²¹ [No title], *Arizona Republican*, Aug. 30, 1903.

¹²² [No title], *Arizona Gazette*, Sept. 2, 1903.

¹²³ [No title], *Arizona Gazette*, Sept. 2, 1903.

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

By 1904, the Reclamation Service was seeking to have Phoenix-area residents finance the road to Roosevelt on the grounds that they would be the beneficiaries of the water stored there. As part of the effort to secure local funding for the road, on March 8, 1904, the *Phoenix Republican* reprinted a letter from Reclamation Service Chief Engineer Frederick H. Newell to B.A. Fowler, President of the Salt River Valley Water Users' Association. The letter outlined the reasons why voters in the communities in the Salt River Valley should approve bonds to be issued to finance a road from the valley to Roosevelt Dam site. Newell pointed out that in building the reservoir, large quantities of supplies had to be shipped to the site via a round-about route:

Under the present conditions all material and men must go to a point on the Southern Pacific Road in the southeastern part of the territory, transfer to a short independent railroad, 125 miles, to go to the town of Globe and then travel a road of 40 miles or more in length to the site of the dam. From the railroad point at Globe to the dam site is nearly as far as from the Salt River Valley.

Newell added that it was essential to have the road from the valley built to diminish construction and transportation costs. Nevertheless, he made no mention of using the river as a means of commerce between the region around Phoenix and the reservoir site.¹²⁴

The volume of shipping necessary to supply the multitude of workers at what became the Town of Roosevelt was prodigious and can be appreciated by the following three photographs. The first two pictures show the temporary Town of Roosevelt – which housed workers for Roosevelt Dam – just above the confluence of the Upper Salt River and Tonto Creek and slightly upstream from the construction site for the dam. The third photograph provides an idea of the

¹²⁴ “The Tonto Road,” *Phoenix Republican*, March 8, 1904.

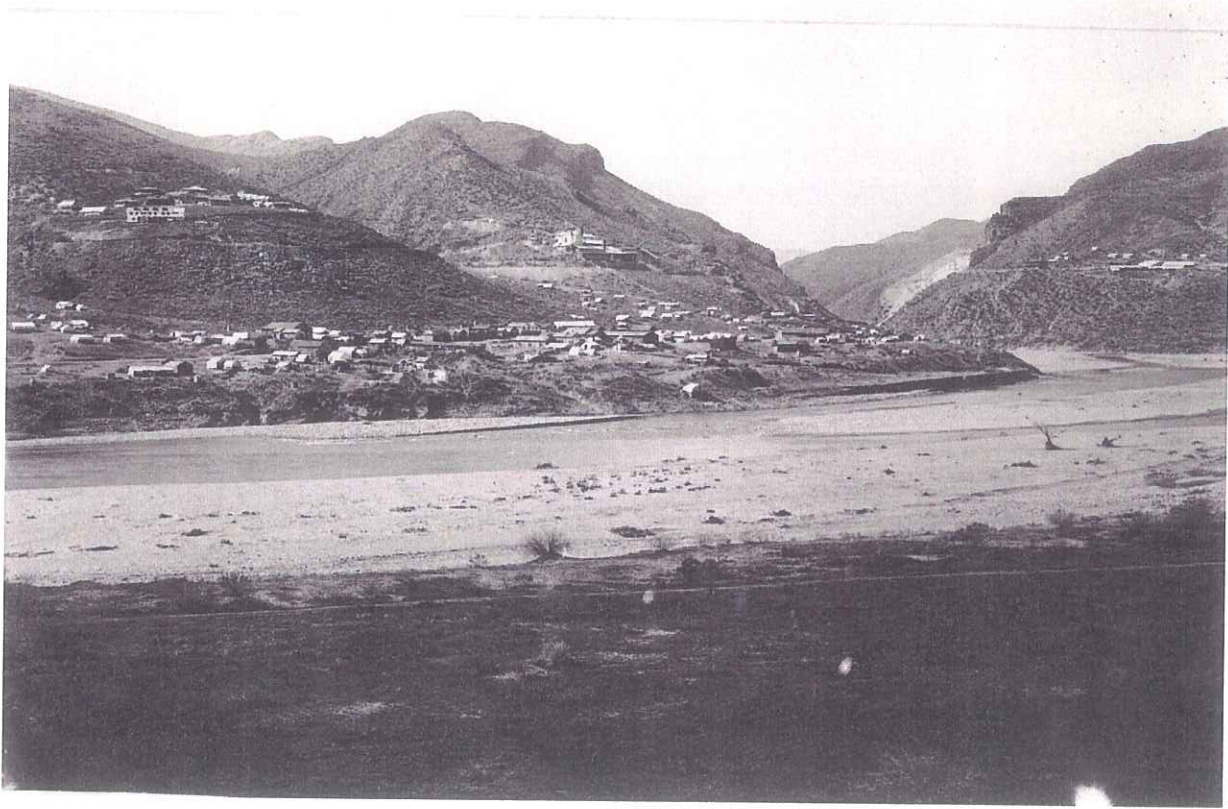
“creature comforts” necessary to house workers at the site for many months at a time – construction on the dam took several years.



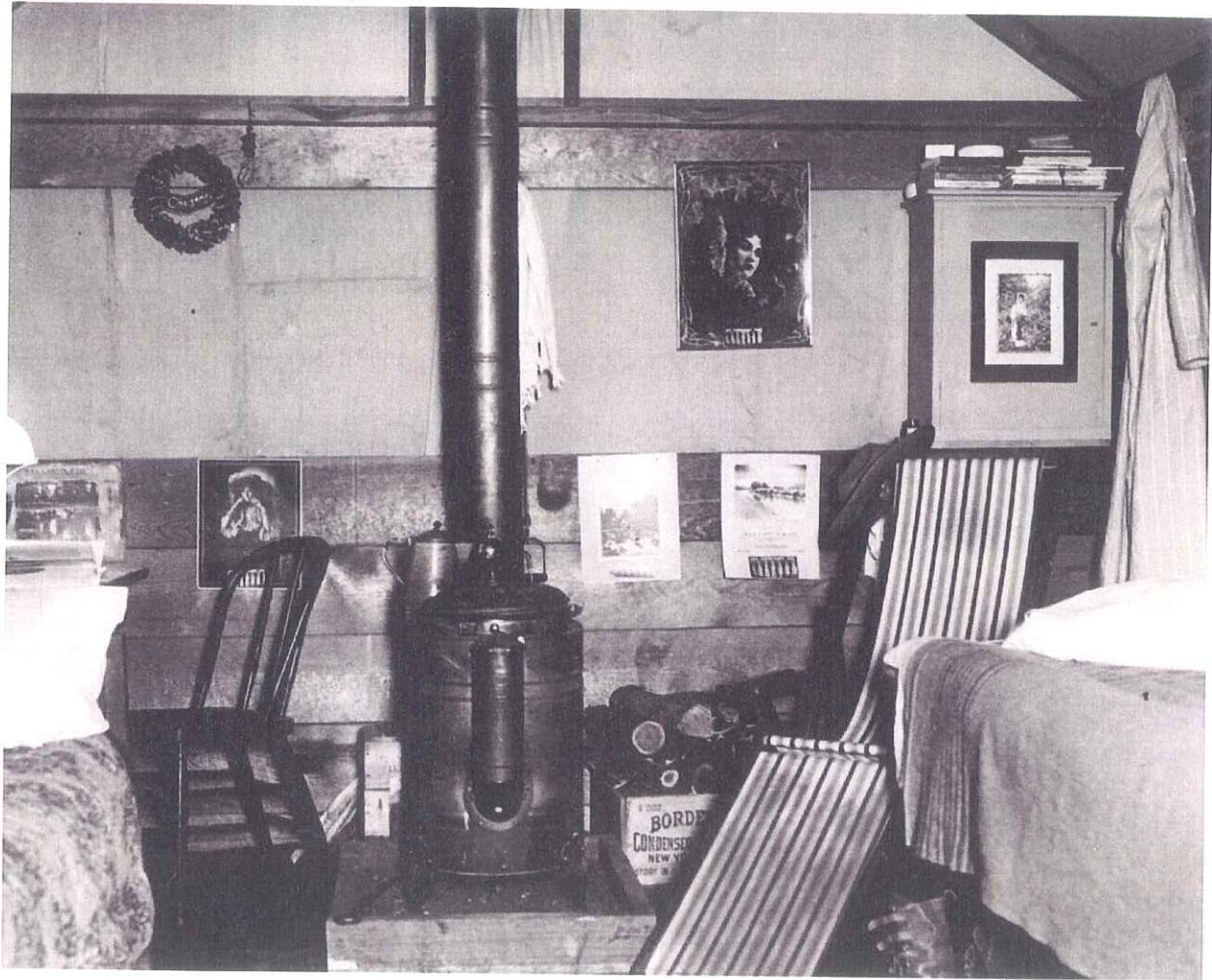
130. Looking up Salt River, showing junction of Salt and Tonto Rivers and location of camp at dam site. Jan. 14-1904.

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Photograph of “Looking Up Salt River, Showing Junction of Salt and Tonto Rivers and Location of Camp at Dam Site,” January 14, 1904, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

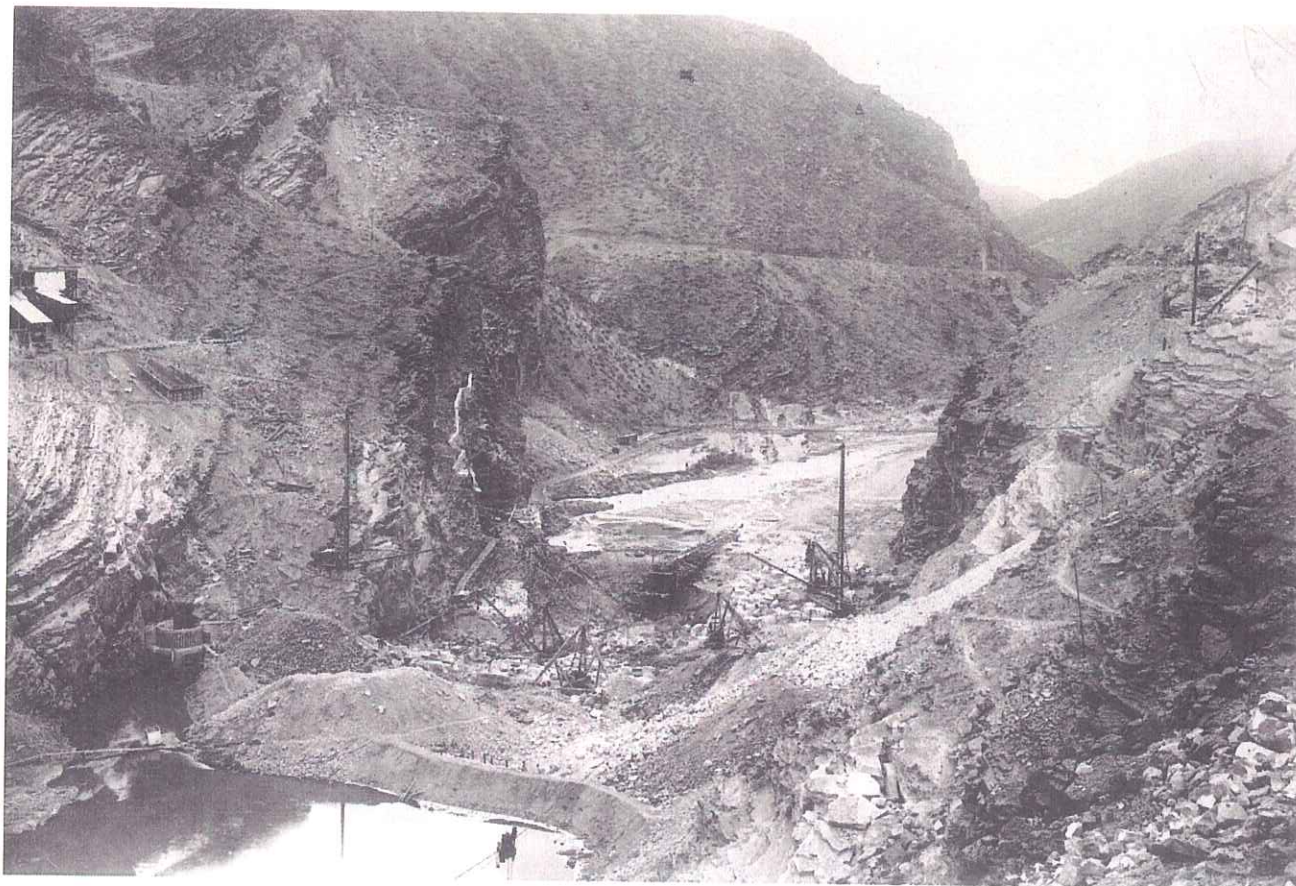


Photograph of "Salt River Project, Arizona. Roosevelt, Arizona, [Looking Downstream toward Roosevelt Damsite, with Tonto Creek's Confluence with the Salt River to the Right of the Picture]," [circa 1910], Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of “Interior [of a] Tent, Headquarters Camp,” January 23, 1906, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

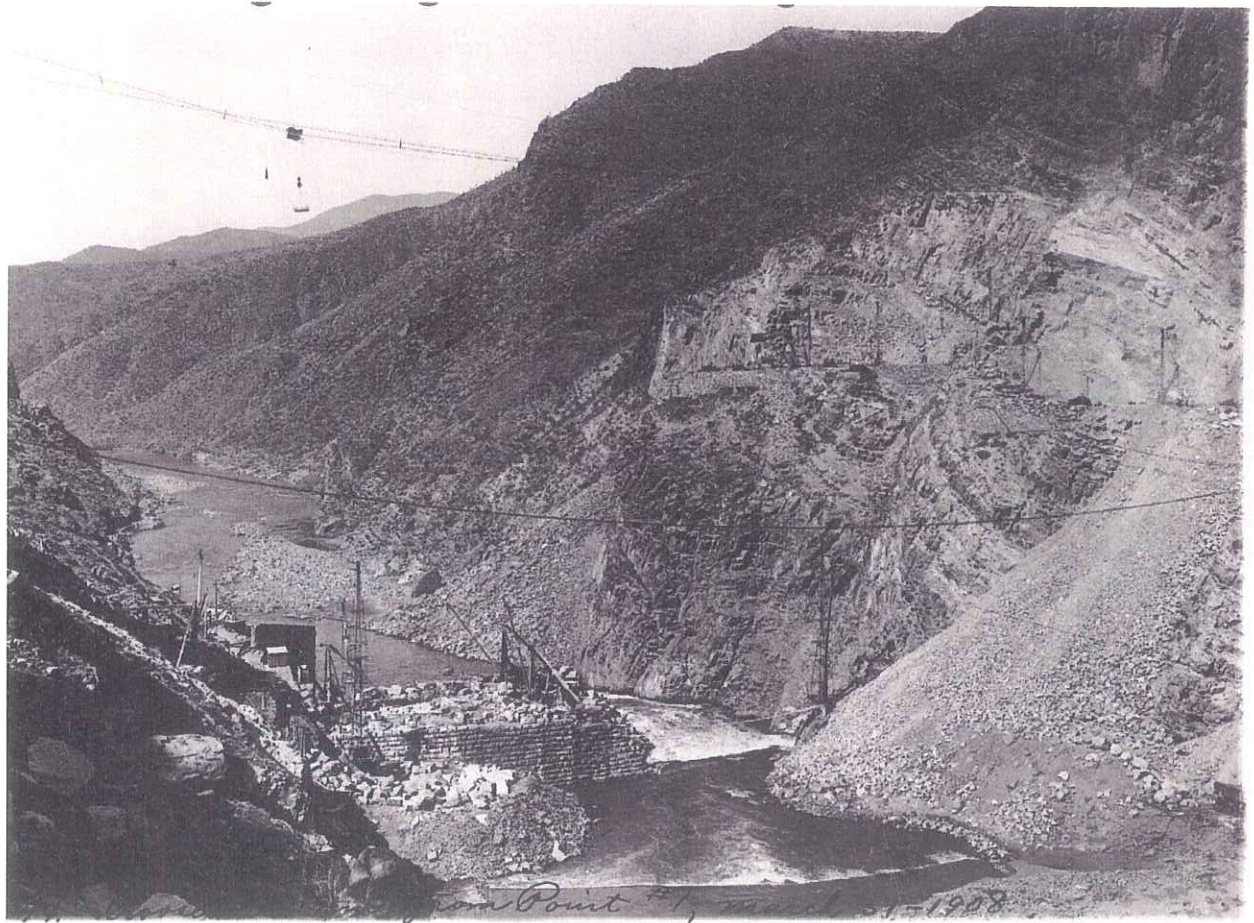
Aside from supplies for workers, a huge amount of construction equipment and machinery had to be brought to Roosevelt for work on the dam itself. The scale of construction (and, by implication, the quantity of equipment) can be judged from the following photographs taken as work on Roosevelt Dam went forward. The nature of the Salt River’s channel also can be seen (and assessed in relation to navigability) in the photographs.



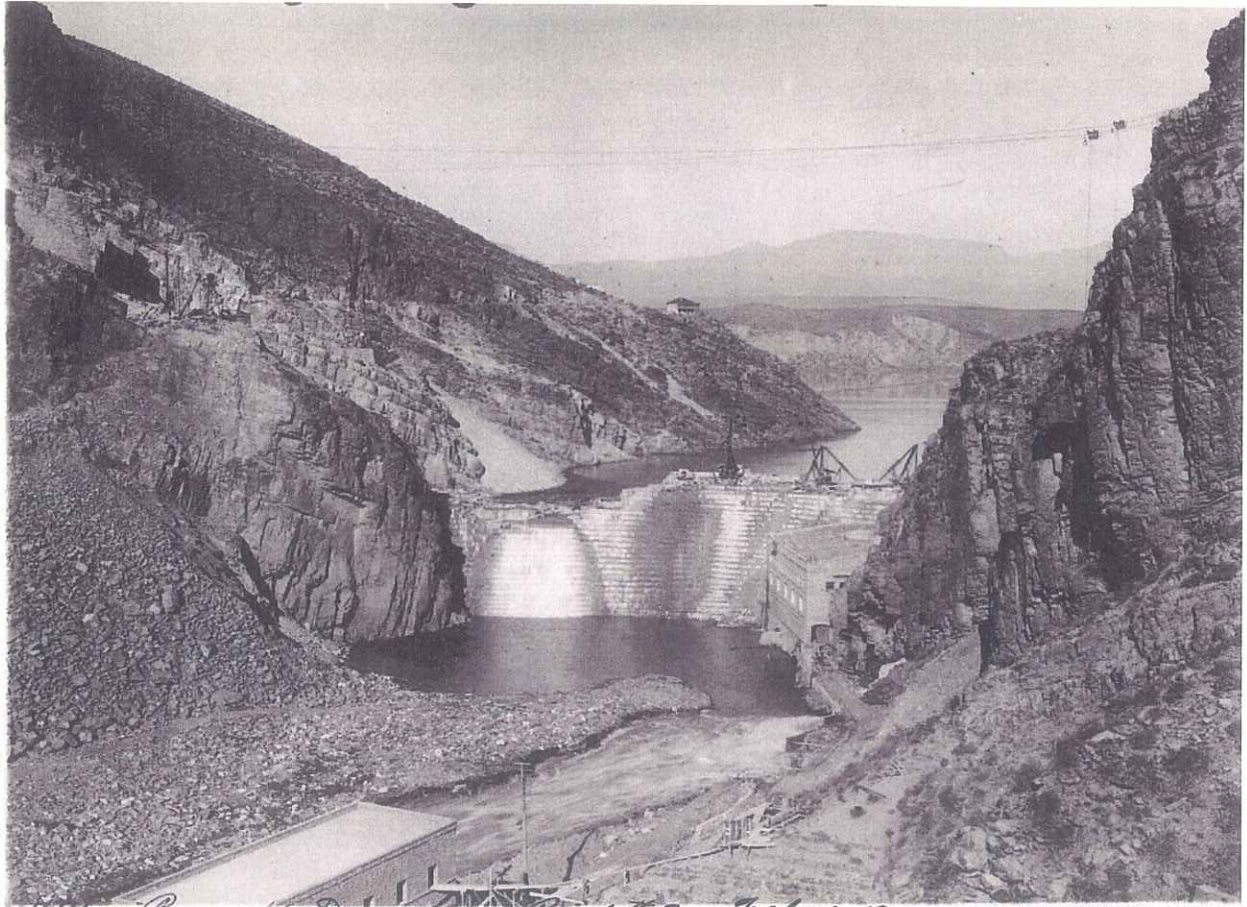
Photograph of "Roosevelt Dam [Looking Downstream]," [circa 1905-1906], Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of "Roosevelt Dam [Looking Upstream]," [circa 1905-1906], Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of "Roosevelt Dam [Looking Downstream] from Point #1," March 31, 1908,
Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region,
Denver, Colorado

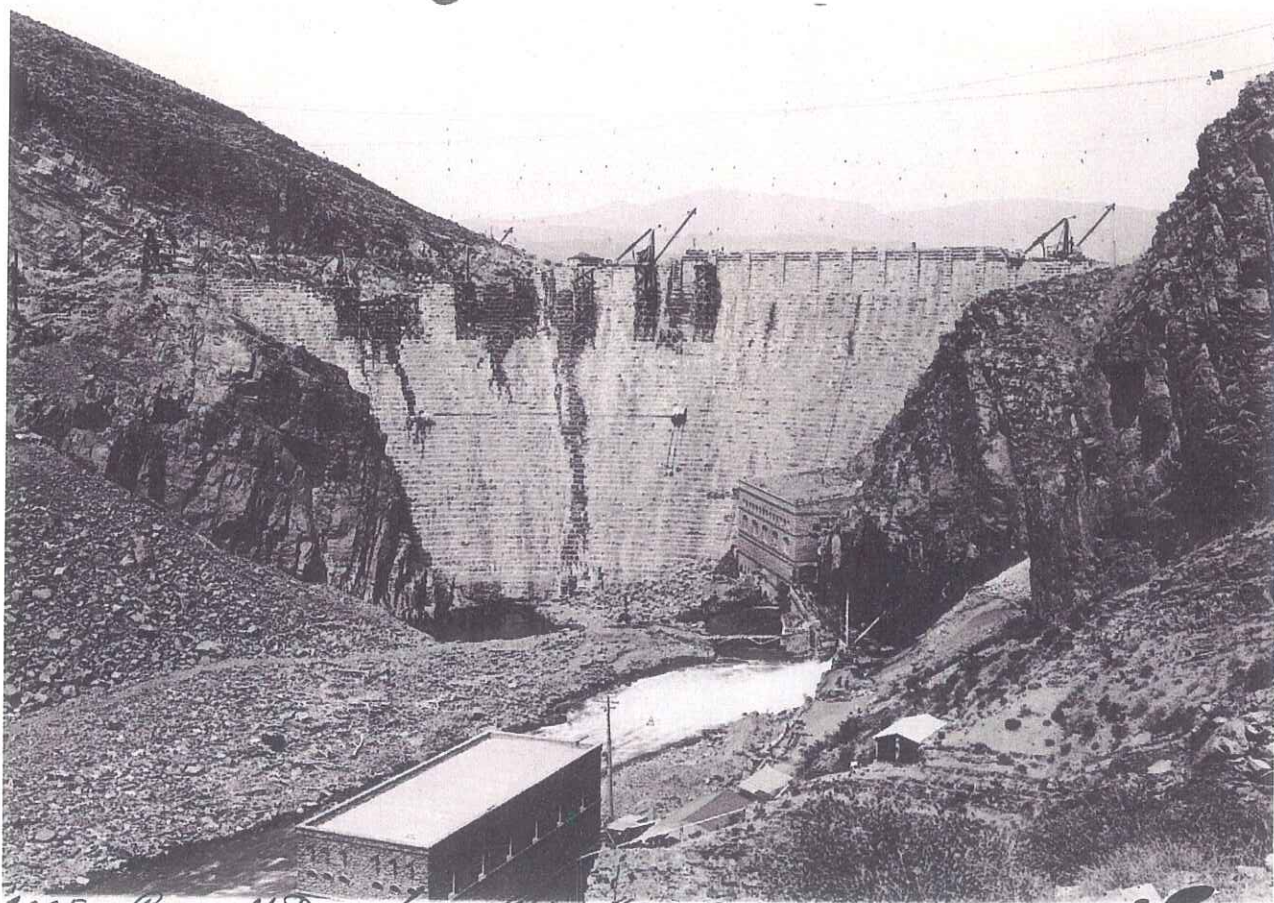


1681. Roosevelt Dam from Point #3. Feb. 1-1909.

Photograph of "Roosevelt Dam from Point #3 [Looking Upstream]," February 1, 1909, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of "Roosevelt Dam from Point #3 [Looking Upstream]," July 31, 1909, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



2025. Roosevelt Dam from Point #3, May 2-1910.

Photograph of "Roosevelt Dam from Point #3 [Looking Upstream]," May 2, 1910, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

Ultimately, because of the sheer scale of the undertaking to build Roosevelt Dam (and due to the fact that the Upper Salt River was not navigable), the road from Phoenix to Roosevelt was built, and historical photographs document the extremely rugged terrain through which the road ran. The photographs, some of which are reproduced below, clearly demonstrate that had the Salt River been navigable, the Reclamation Service never would have sought reliance on such a difficult overland route as that provided by the Tonto Road, preferring instead the easier and more cost-effective transport that water would have afforded. The first three photographs illustrate the difficulty involved in building the Tonto Road.



Photograph of "View Showing Construction on High Line Wagon Road Directly above Salt River Dam Site on East Side of Canyon," March 29, 1905, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



573. *Completed through cut on high line wagon road directly above
the east wall of Salt River dam site.*

Photograph of "Completed Through Cut on High Line Wagon Road Directly above the East Wall of Salt River Dam Site," [circa 1905-1910], Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



companion view to 573, showing cliff before excavation.

Photograph of “Companion View to 573 [Photograph on Previous Page], Showing Cliff Before Excavation,” [circa 1905], Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

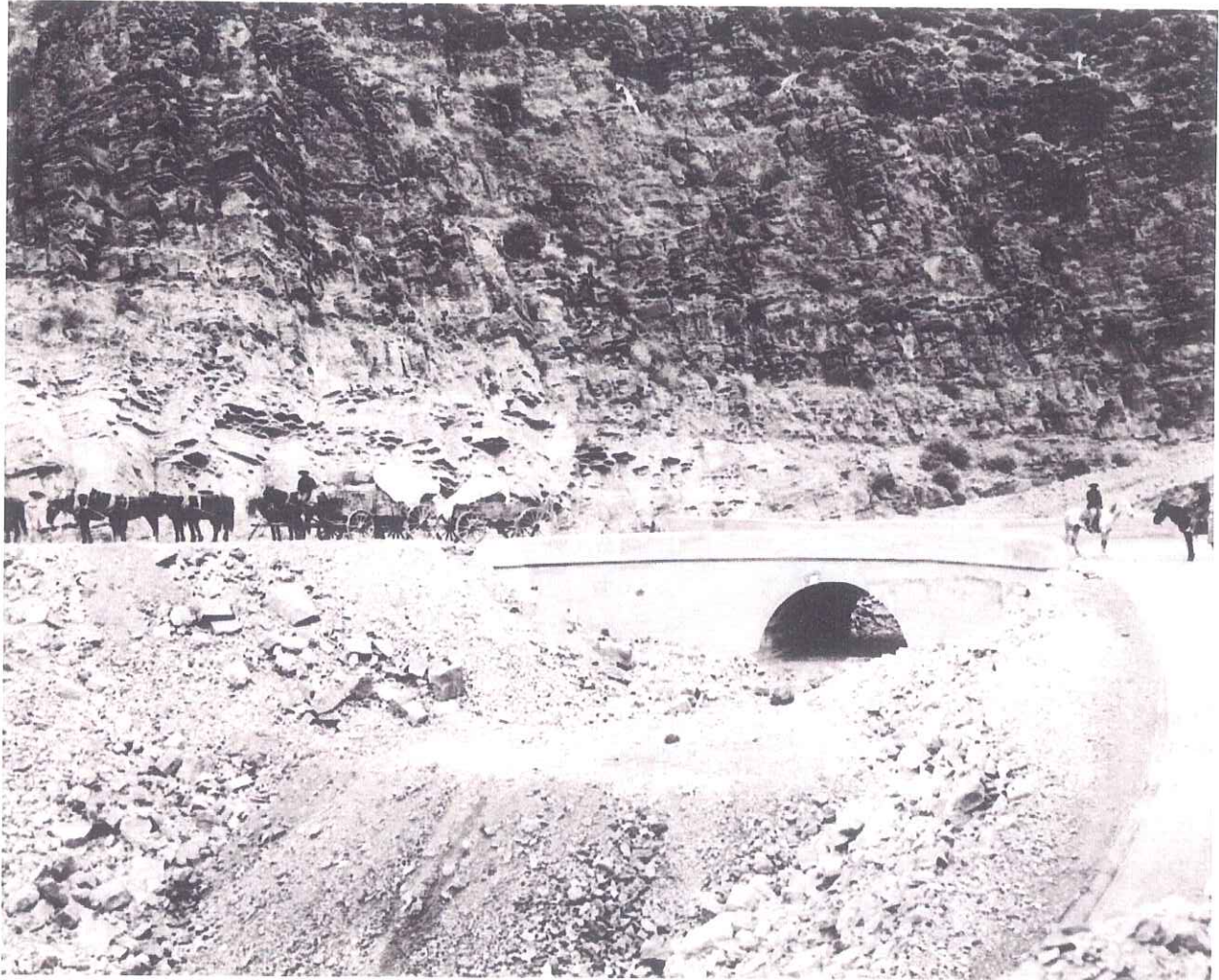
The following photographs illustrate the extreme difficulty of freighting operations and passenger transportation over the Tonto Road to Roosevelt Dam (or, in the case of the last photograph in this set, from Roosevelt back to Granite Reef Dam) in the early twentieth century. Due to the narrowness of the road, in some cases wagons (and later, automobiles) sometimes had to pull over where room permitted to allow other vehicles and horses to pass.



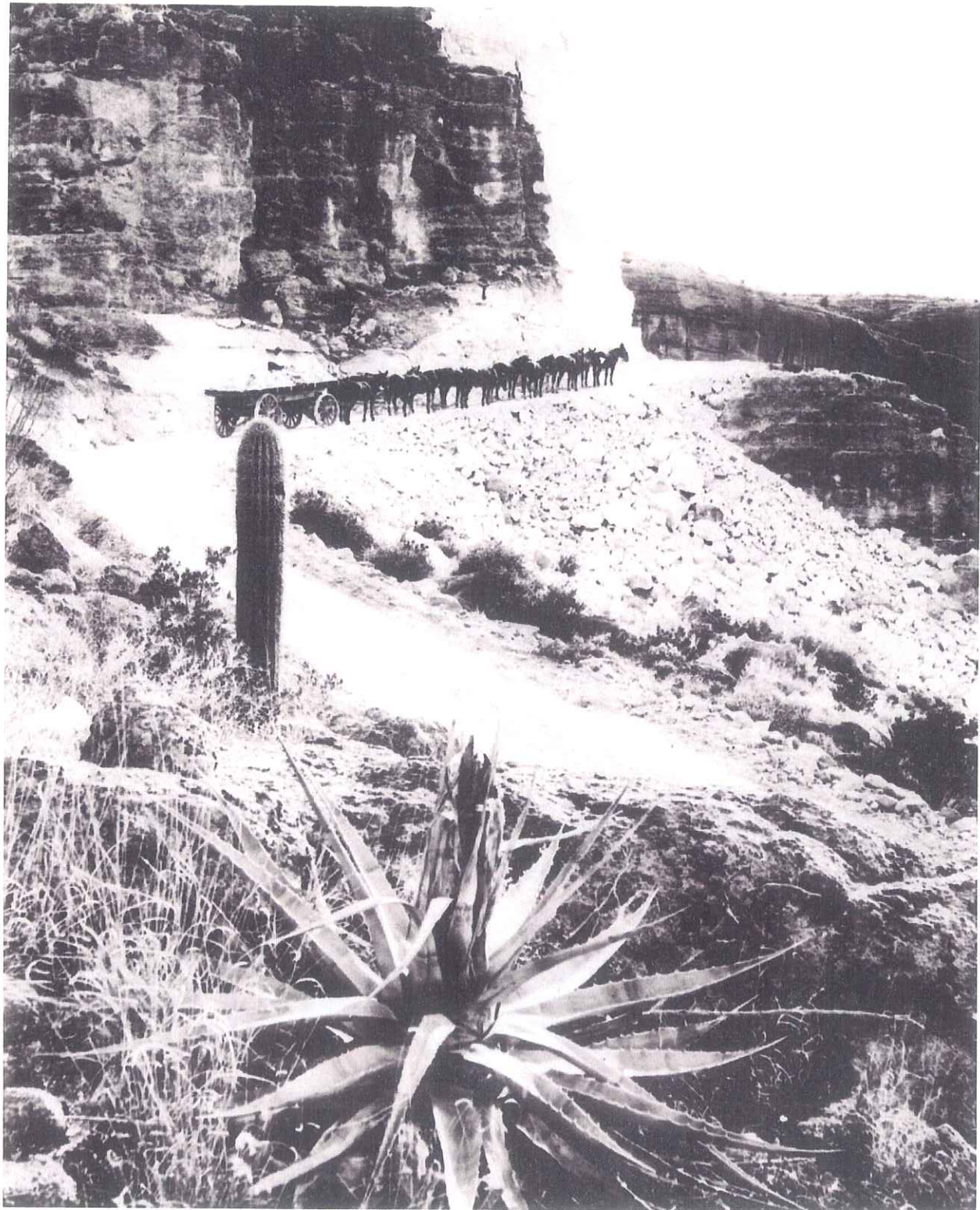
Photograph of "Freighting the Heavy Machinery of Salt River Power House into Roosevelt from Mesa, the Railroad Point," n.d., Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of "Meeting a 12 Horse Freighting Outfit Coming Up Fish Creek Hill, Ariz. 11,000 lbs. Being Shipped from Govt. Cement Plant at Roosevelt, Ariz. to Granite Reef, Ariz." March 27, 1907, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of "Whitney's Bridge, High Line Road, Just below [Roosevelt] Damsite," December 1, 1906, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of "Top of Fish Creek Hill, Ariz., on the Mesa & Roosevelt Stage Road. 60 Mile Road Constructed by U.S.R.S.," March 27, 1907, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of “Looking Up Fish Creek Hill Near Bridge,” July 2, 1914, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

Once the road to the Roosevelt Dam site had been completed, the Reclamation Service constructed connector roads to carry men and material to work sites along the Salt River. These side roads also were used to convey rock and cement from the Roosevelt site to places where such supplies were necessary, such as at Granite Reef Dam. The local press carried accounts of this supplementary road building, continuing to ignore the possibility that the Salt River itself might be used for ferrying supplies along the stream. For instance, on May 25, 1906, the *Phoenix Republican* reported that the Reclamation Service recently had conducted a new road

survey on the south side of the Salt River to connect with the main road to Roosevelt Dam.

“This survey,” the paper wrote, “of [the] proposed new road is a matter of considerable importance to the people of the valley, for it is another step in the direction of the securing of a permanent diversion dam.” The road, the *Republican* continued, was to be used to carry cement from the plant at Roosevelt to a future diversion dam site, which was to be near Granite Reef. The newspaper added that the road “will touch any desirable point along the river.” There was no suggestion that commercial navigation interests objected to the idea of a diversion dam at Granite Reef, and the discussion of the road made it clear that the river was not being used to convey goods along the Salt River by water.¹²⁵

The road from Phoenix to Roosevelt had to be maintained after its completion. Press articles about such matters still did not mention the possibility of water transportation along the Salt River above Granite Reef Dam. The *Arizona Gazette* reported on September 25, 1906, that improvements were being made to the Roosevelt Road in preparation for winter flood flows:

In addition to the work that is being carried on at the [diversion dam construction] camp, improvements and fortifications are being made in the Roosevelt road so that the winter rise will not interfere with the transportation of cement from Roosevelt to the damsite. The granite . . . is hauled down this famous road by freighters to a point near Mesa and is taken from there across a new road built especially by the government engineers for the purpose.¹²⁶

There were many accounts in the press of travelers who made the difficult journey by stage to the Roosevelt Dam site along the Tonto Road. On January 27, 1908, the *Arizona Gazette* reported on the events of one such stagecoach trip. Noting that the journey required eight hours and covered sixty miles, the article also stated that there was a considerable amount of wagon freighting taking place on the road:

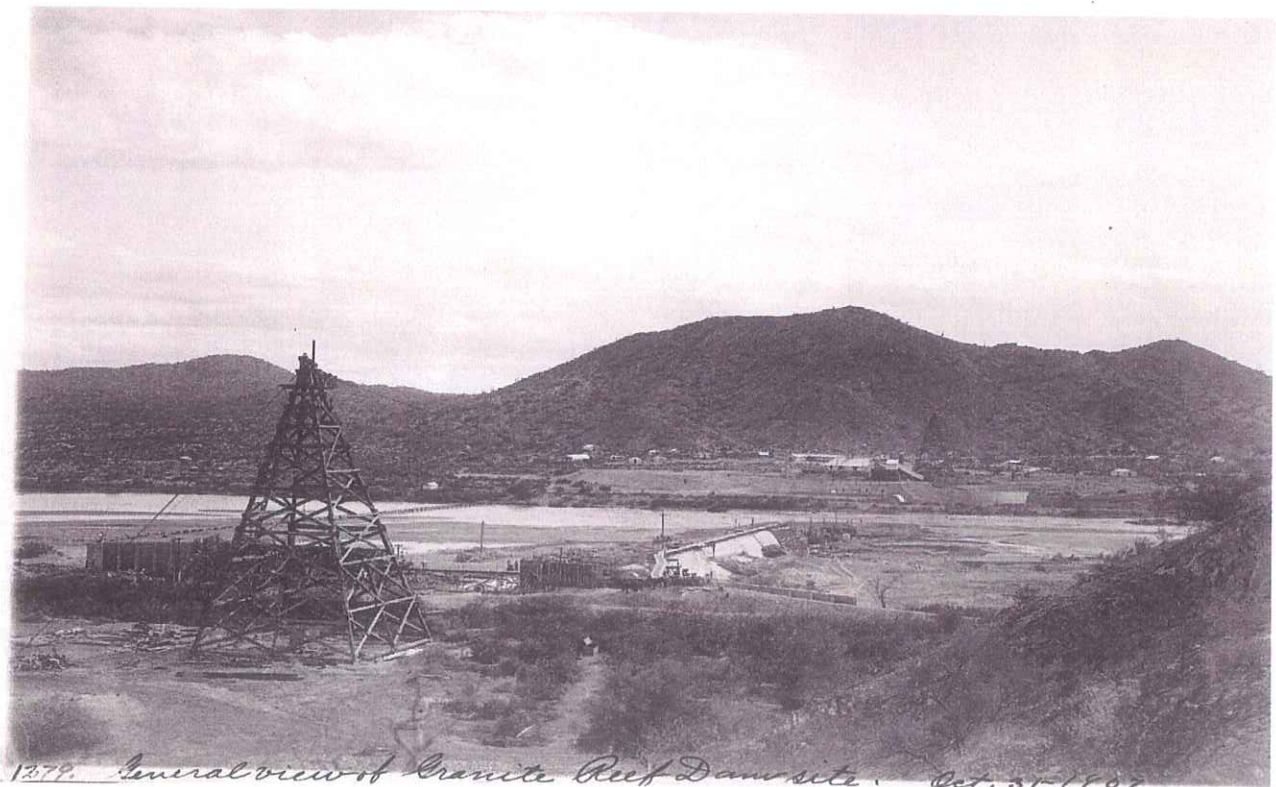
¹²⁵ “Prospective Site of Diversion Dam,” *Phoenix Republican*, May 25, 1906.

¹²⁶ [No title], *Arizona Gazette*, Sept. 25, 1906.

There are many men and teams engaged in hauling stuff to Roosevelt by wagons. On one trip the stage will meet forty wagons. Four to six horses are generally used and the outfits travel in pairs, the owners or drivers camping together.¹²⁷

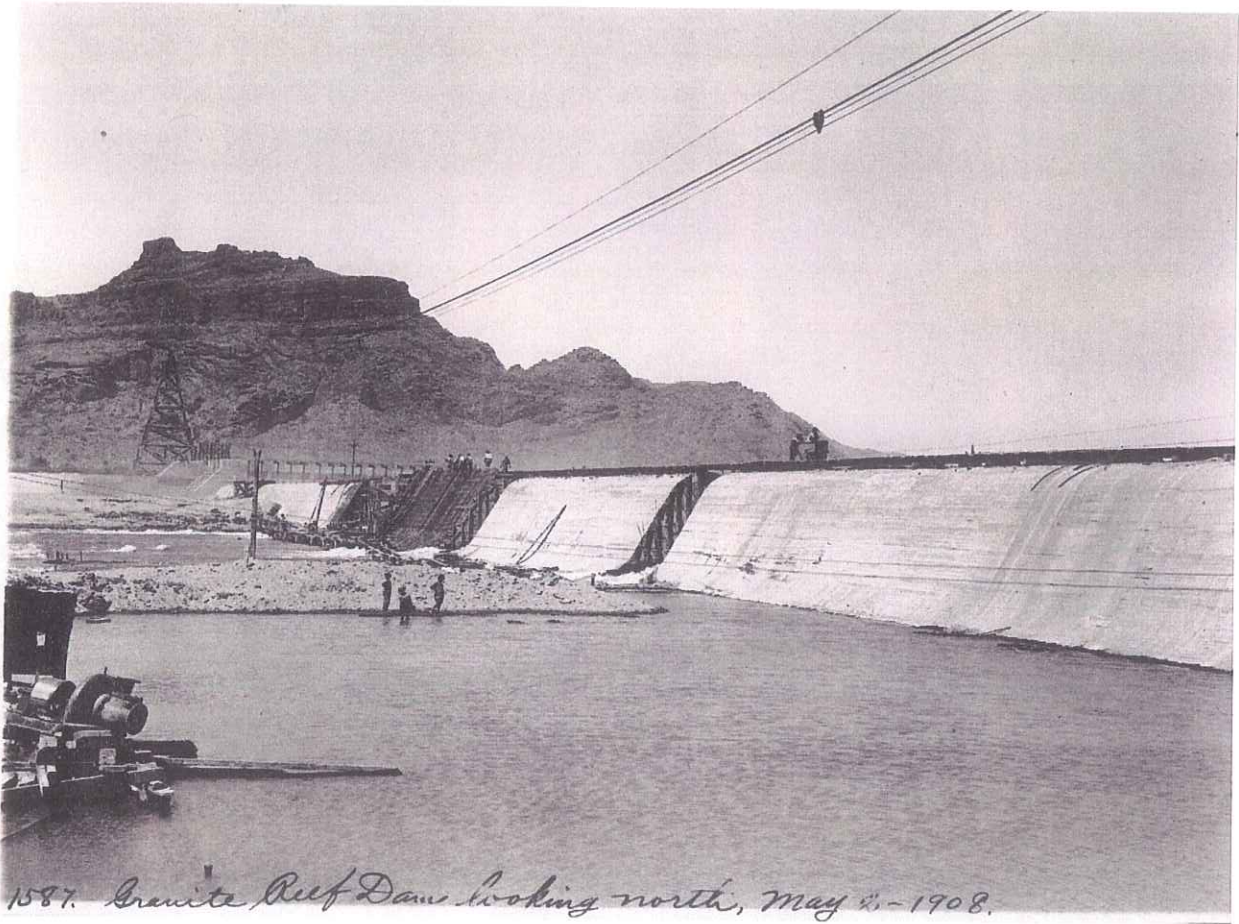
There was no suggestion that any freighting was being done on the Salt River, though the article was quite long and detailed about other activities along the river and at Roosevelt.

Like Roosevelt Dam, Granite Reef Dam also would obstruct potential navigation on the Salt River, but there is no evidence that anyone objected to this diversion facility being built. The following photographs illustrate Granite Reef Dam's locale, its construction (the dam was completed in 1910), and the nature of the Salt River at that location around the time of Arizona's Statehood in 1912.

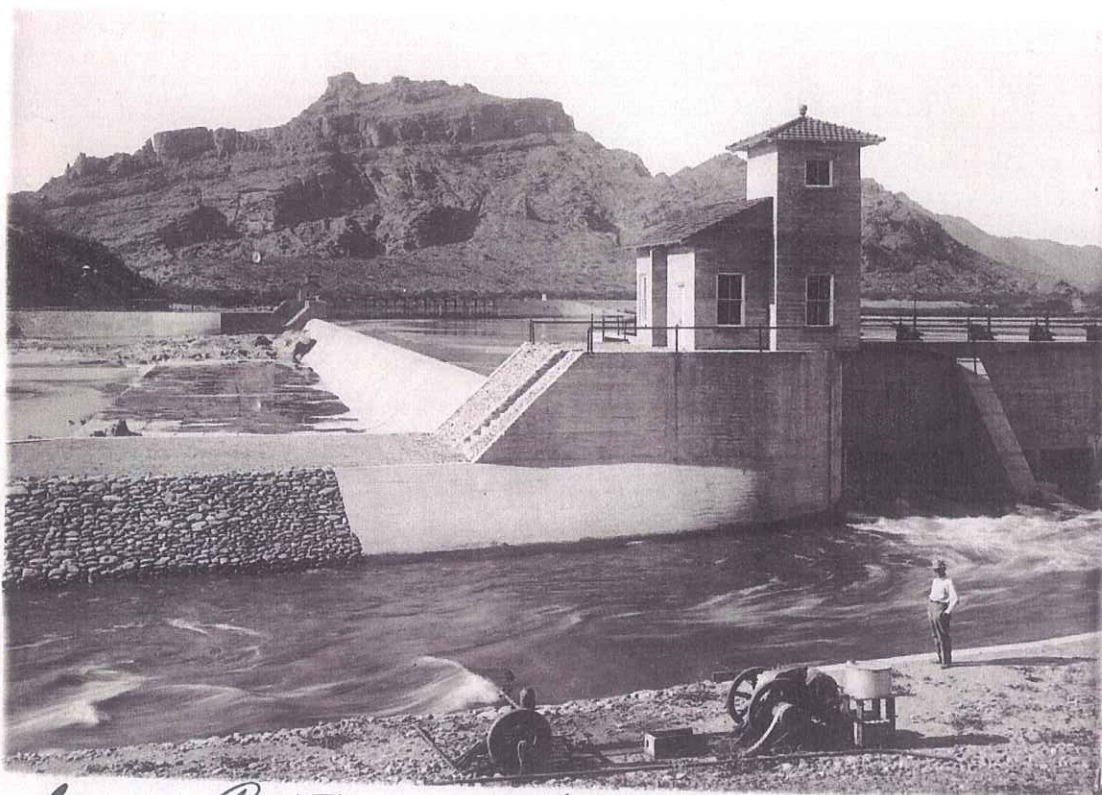


Photograph of "General View of Granite Reef Damsite," October 31, 1907, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

¹²⁷ [No title], *Arizona Gazette*, Jan. 27, 1908.



Photograph of "Granite Reef Dam Looking North" May 2, 1908, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



2065. Granite Reef Dam completed - April 29-1910.

Photograph of "Granite Reef Dam Completed," April 29, 1910, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

One final example illustrated the contemporaneous belief in the lack of navigability of the Salt River. On August 30, 1908, the *Arizona Republican* carried an account that a ferry boat to be used on the lake behind Roosevelt Dam had arrived by overland transportation in Mesa and was being freighted by wagon to the reservoir:

A large ferry boat, to be used on the lake at the Roosevelt dam, left Mesa yesterday morning for its destination. W.H. Otterson had a team of twelve horses attached to two large freighting wagons which was used in the transportation of the boat. It has an ample capacity for a team and a wagon, and it is proposed to use this to connect passengers with the Mesa-Roosevelt and Globe stage routes.¹²⁸

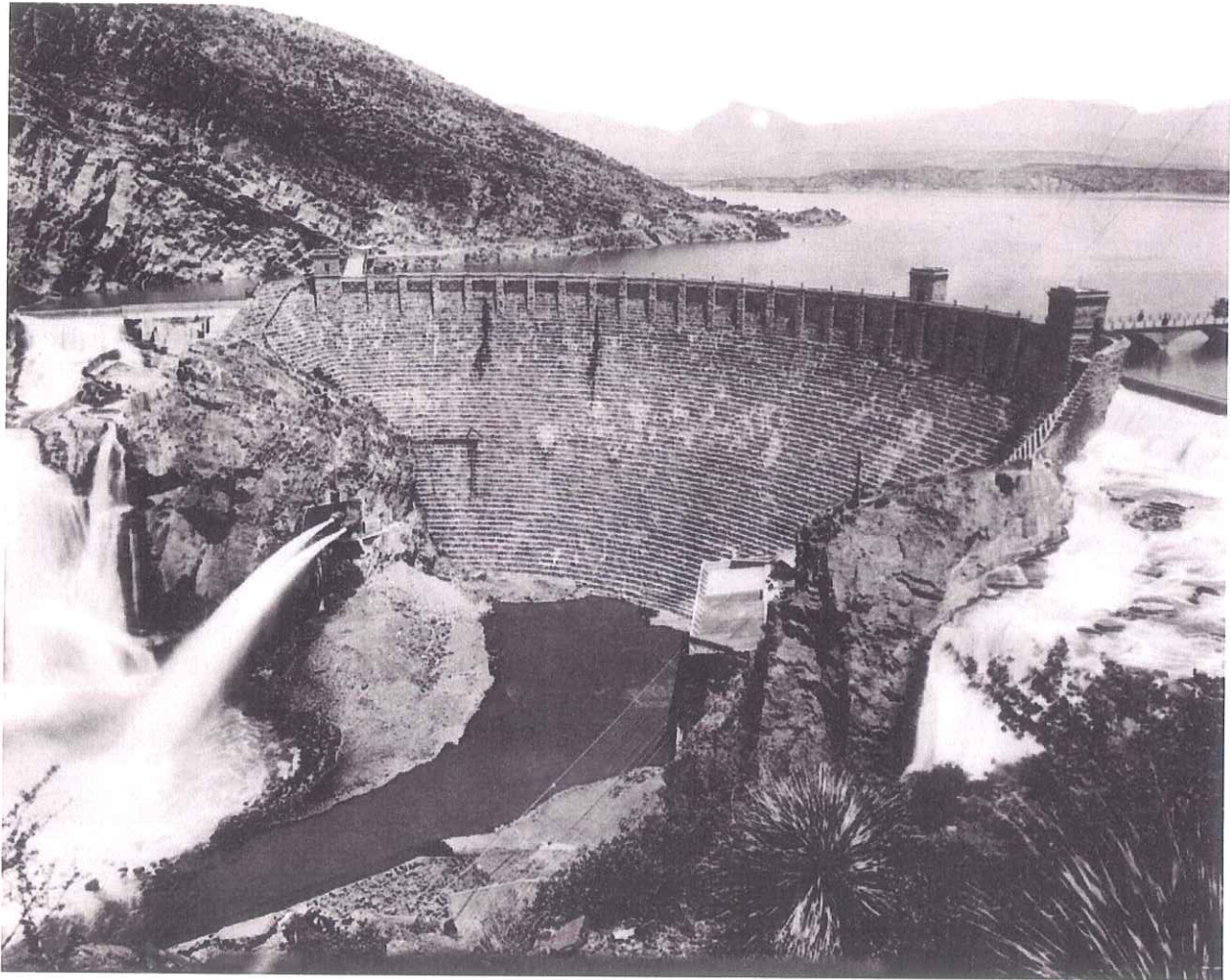
¹²⁸ "Ferry Boat for Roosevelt," *Arizona Republican*, Aug. 30, 1908.

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

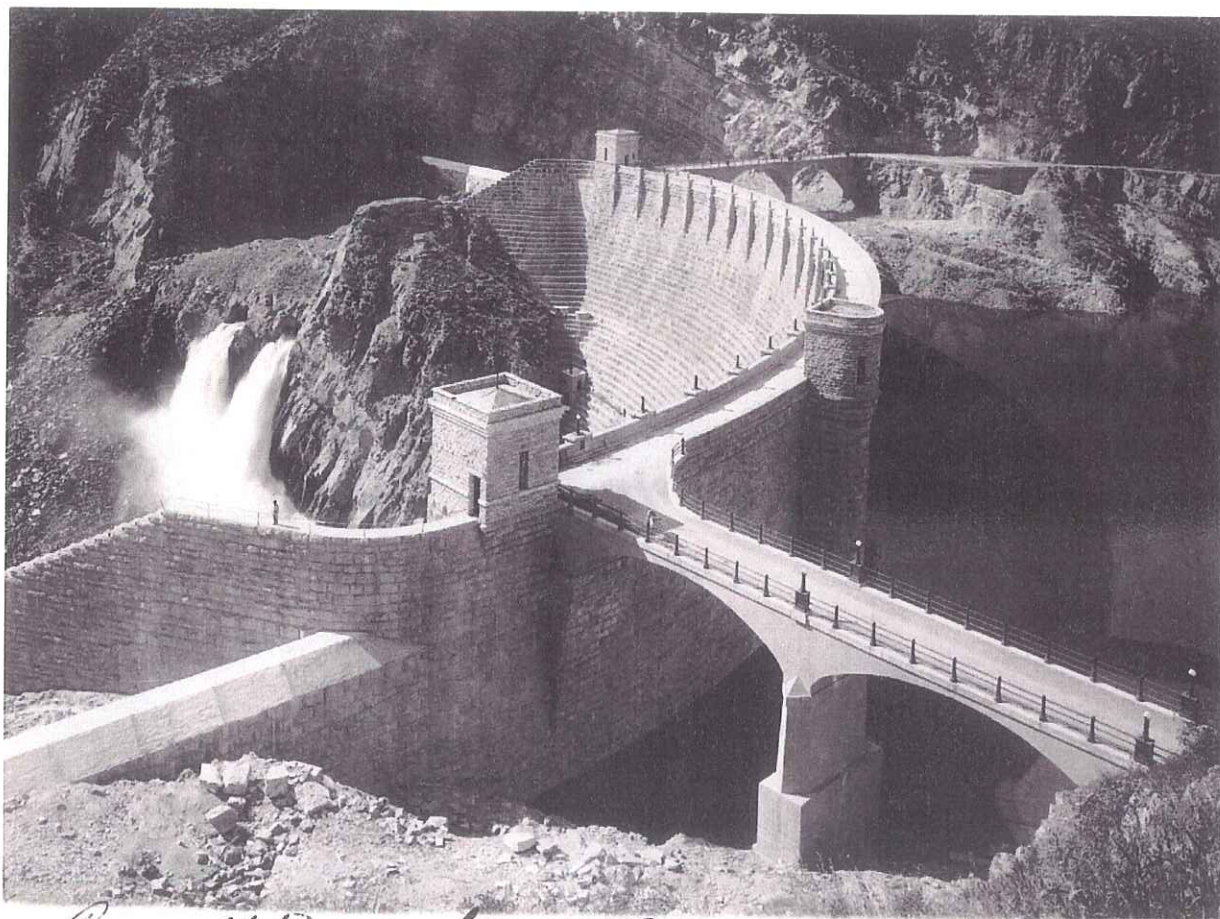
Even the end of construction on Roosevelt Dam in 1911 and the appearance of President Theodore Roosevelt at the dedication ceremonies prompted no objections from navigation interests to the presence of Roosevelt Dam, Granite Reef Dam, other Salt River Project facilities along the Upper Salt River or lower Tonto Creek. Instead, the ceremony marking the completion of Roosevelt Dam was a cause of celebration throughout the Salt River Valley. The following photographs illustrate the completion of Roosevelt Dam and the scale of water storage behind that dam serving the Salt River Project.



Photograph of "Dedication Ceremonies of Roosevelt Dam. Col. Roosevelt Speaking," March 18, 1911, Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Photograph of "Roosevelt Dam, Salt River Project, Arizona," n.d., Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado



Roosevelt Dam, from Road about March 18-1911.

Photograph of "Roosevelt Dam, from Road about March 18-1911," Records of the Bureau of Reclamation, U.S. National Archives Branch, Rocky Mountain Region, Denver, Colorado

A. SUMMARY AND CONCLUSIONS REGARDING NEWSPAPER ACCOUNTS OF THE SALT RIVER

As one of the most dominant features of the topography of the Salt River Valley as well as the source of irrigation water for hundreds of farms in the years leading up to Arizona's Statehood, the Upper Salt River constantly figured in news accounts by the Phoenix-area press. These newspaper stories illustrated a river that varied enormously in flow, from completely dry to raging torrents. They also emphasized the crucial importance the stream (and its tributary, Tonto Creek) played to the economic well-being of the region. Nonetheless, despite countless

articles detailing nearly every aspect of the Salt River, there is no indication in the press reports that the stream was useful for transportation or that it could have been employed in that manner. Instead, the newspaper articles observed repeatedly that roads and railroads were the principal means of carrying goods and people. In those cases where boats were used on the Salt, the manner in which those stories were written made it clear that such instances were the exception rather than the rule. Historical photographs from the period reinforce these views.

The importance of newspaper accounts not showing the Salt River to be regularly navigable is emphasized by the fact that had the stream been useful for transportation on a regular and reliable basis, the booster qualities inherent in late nineteenth and early twentieth century American West newspapers surely would have prompted the Phoenix-area press to bring this attribute of the Salt to the attention of readers far and wide. Likewise, historical photographs surely would have captured images of watercraft being used on the Salt River or Tonto Creek to carry people or commerce. That the local papers did not deem the river to be navigable on a regular basis and that historical photographs did not illustrate navigation, is therefore clearly significant.

SUMMARY AND CONCLUSIONS

Historical documents describing the Upper Salt River and lower Tonto Creek cover a wide spectrum of published and unpublished sources, including U.S. Government, State, and Territorial materials; newspaper accounts; photographs, and other archival records.

Some of the most important sources for ascertaining the nature of the Upper Salt River and Tonto Creek prior to and at the time of Arizona's Statehood in 1912 are survey field notes and plats created by U.S. Government surveyors as they carried out their responsibilities mapping Arizona. Directed by manuals conveying precise instructions, surveyors were to make careful note of the region in which they were working, and they were provided with specific instructions about how to record the presence of navigable bodies of water. The field notes of these surveys for the Upper Salt and Tonto Creek area all conformed with instructions for streams that were not navigable.

Supporting the U.S. Government surveys' determination that the Upper Salt River and Tonto Creek were not navigable are Government homestead patents and U.S. grants to Arizona. In every single case when these patents were formalized, the United States made no effort to deny title to the applicants for areas involving the beds of these bodies of water based on a possible claim of ownership due to Arizona's sovereignty. Furthermore, when lands were granted to Arizona through which the Salt River or Tonto Creek flowed, the State made no effort to obtain in-lieu selections for the acreage covered by those streams' beds – as the State would have been entitled to do had the waterways been navigable at the time of Statehood.

The U.S. Government patent process and grants to Arizona are significant in relation to determining the Upper Salt River's navigability and that of Tonto Creek because with so many different parcels and transfers of land involved, a large number of parties ultimately reached the

same conclusion – that the Salt River and Tonto Creek were not navigable. Each applicant who requested land through which either stream flowed implicitly asserted that stream’s non-navigability. Each federal official approving a homestead application or grant to Arizona reached the same implicit conclusion. Not only did many individuals all indicate the same finding with regard to the Upper Salt River’s non-navigability and that of Tonto Creek, 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 Upper Salt River and Tonto Creek were not navigable in 1912 are other published and unpublished records of the U.S. Government. Records of the U.S. Reclamation Service, the Geological Survey, and the Department of Agriculture all described a stream that was extremely erratic in flows, subject to severe floods, and blocked by obstacles.

Newspapers and historical photographs also support the idea that the Upper Salt and Tonto Creek were not navigable at Statehood. The press stressed that roads and railroads carried commerce in the Upper Salt River region, not the stream itself. And, of course, the newspapers and photographs recorded the major efforts to block the Upper Salt and Tonto Creek for water storage (with no articles describing objections by navigation interests).

Much like the press, other historical documents all reached the same conclusion regarding the lack of navigability of the Salt River. Indeed, the Arizona Territorial Legislature, as one of its first acts in 1865, declared that the only stream in Arizona that was navigable was the Colorado, and Karen Smith, a historian of the Salt River Project, declared in her seminal study of that federal undertaking that the Phoenix area had never had any port on a navigable body of water.

From this wealth of information, covering a huge array of documentary sources, only one conclusion can be reached: The Upper Salt River and Tonto Creek were not navigable on or before February 14, 1912.

APPENDIX A – SOURCES CONSULTED: STATE ARCHIVES AND AGENCIES

A. ARIZONA STATE UNIVERSITY

FILE TITLE: Maricopa County Superior Court – Nels Benson v. J. Allison & . . . Others

COLLECTION: Hancock Family Collection

LOCATION: box 2, file 16

ARCHIVE: Arizona Historical Foundation, Tempe

FILE TITLE: Irrigation and Agricultural Practice in Arizona (R.H. Forbes)

COLLECTION: Hancock Family Collection

LOCATION: Box 2, Folder 19

ARCHIVE: Arizona Historical Foundation, Tempe

FILE TITLE: File 224

COLLECTION: Salt River Valley Water Users Association

LOCATION: Folder 224

ARCHIVE: Arizona Historical Foundation, Tempe

FILE TITLE: “Speech of Hon. Carl Hayden, of Arizona, in the House of Representatives, Thursday, February 3, 1916”

COLLECTION: Carl Hayden Papers, Mss. 001

LOCATION: folder 11, box 653

ARCHIVE: Arizona State University, Tempe

FILE TITLE: Hurley v. Abbott file

COLLECTION: Charles H. Woolf Papers, Mss. 821

LOCATION: folder 9a

ARCHIVE: Arizona State University, Tempe

FILE TITLE: “The Heritage of the Salt River Valley”

COLLECTION: Dorothy Robinson Papers, Mss. 69

LOCATION: folder 69, box 11

ARCHIVE: Arizona State University, Tempe

FILE TITLE: “Argument and Brief of The Highland Land and Water Company, a defendant,” in the Case of *M. Wormser, et al. v. The Salt River Valley Canal Company*

COLLECTION: Grace-Joseph Alexander Papers, Mss. 11

LOCATION: folder 11, box 21

ARCHIVE: Arizona State University, Tempe

FILE TITLE: “Arizona Newspapers, Salt River”

COLLECTION: Newspapers

LOCATION: none
ARCHIVE: Arizona State University, Tempe

B. ARIZONA STATE ARCHIVES

FILE TITLE: "Folder 124"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 4
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "Folder 136"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 4
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "RG 59, 1913-1919, 54: 368"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 39
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "RG 59, 1913-1919, 54: 369"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 39
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "RG 59, 1913-1919, 54: 371"
COLLECTION: State Land Department, Record Group 59
LOCATION: Box 39
ARCHIVE: Arizona State Archives, Phoenix

FILE TITLE: "Combined Flow, Salt and Verde Rivers"
COLLECTION: Water Commissioner of Maricopa County
LOCATION: Microfilm Roll 137.1.5
ARCHIVE: Arizona State Archives, Phoenix

C. SALT RIVER PROJECT ARCHIVES

FILE TITLE: "HAER No. AZ-16, Tempe Canal, South Side of Salt River, Tempe, Mesa and Phoenix"
COLLECTION: none
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "HAER No. AZ-19, Arizona Canal"
COLLECTION: none

LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "HAER No. AZ-8, San Francisco Canal"

COLLECTION: none

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Notice of Lack of Jurisdiction and Request for Termination of Proceedings"

COLLECTION: none

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Photographs, Written Historical and Descriptive Data, Reduced Copies of Drawings"

COLLECTION: none

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Salt River Project, Arizona - Project History, Year 1911"

COLLECTION: none

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: (1988) "An Historical Analysis of the Salt River, 1830-1912"

COLLECTION: none

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

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

COLLECTION: none

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: *Patrick T. Hurley v. Charles F. Abbott*

COLLECTION: none

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: Water Power Development papers, Misc.

COLLECTION: none

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: *M. Wormser, et al. vs. The Salt Valley Canal Co., et al.*

COLLECTION: Court cases
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Statement of the Average Monthly Discharge of Salt River (In Miner's Inches) for the Years 1895-1902"

COLLECTION: Lynch Files
LOCATION: No. 206
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Ap. 21, 1903 to Ap. 16, 1904; p. 2450-2699"

COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "*Arizona Republic & Gazette*, Aug. 19, 1906 to March 24, 1909"

COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Feb. 14, 1902 to Ap. 20, 1903; p. 2200-2449"

COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Jan. 1912 to Nov. 1912"

COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Newsclips 2/1904 - 10/1906"

COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Newspapers-Indexed, Selected Articles"

COLLECTION: Newspaper Clippings
LOCATION: Black Binders
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Accident" through "Distribution of Water"

COLLECTION: Zarbin Newspaper Collection (Alphabetical)
LOCATION: none
ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Diversions" through "River"

COLLECTION: Zarbin Newspaper Collection (Alphabetical)

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

FILE TITLE: "Roads" through "Watershed"

COLLECTION: Zarbin Newspaper Collection (Alphabetical)

LOCATION: none

ARCHIVE: Salt River Project Archives, Phoenix

APPENDIX B – SOURCES CONSULTED: UNPUBLISHED DOCUMENTS FROM FEDERAL AGENCIES, FEDERAL ARCHIVES, AND MISCELLANEOUS ARCHIVES

A. U.S. NATIONAL ARCHIVES BRANCH, DENVER

FILE TITLE: “Annual Report of Operation and Maintenance for the Agricultural Year 1914-1915”

COLLECTION: Record Group 115

LOCATION: Engineering and Research Center Project Histories, 1911-1991, Box 158

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: “History of the Project for the Calendar Year 1912”

COLLECTION: Record Group 115

LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: “History of the Project for the Calendar Year 1913”

COLLECTION: Record Group 115

LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: “History of the Project for the Calendar Year 1914”

COLLECTION: Record Group 115

LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: “History of the Project for the Calendar Year 1915”

COLLECTION: Record Group 115

LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: “Salt River Project, Arizona, Project History Year 1911”

COLLECTION: Record Group 115

LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: “Salt River Project, Final History (to 1916)”

COLLECTION: Record Group 115

LOCATION: Engineering and Research Center Project Histories, 1911-1991, Box 142

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: “Salt River Project-Annual Project History, 1916”

COLLECTION: Record Group 115

LOCATION: Engineering and Research Center Project Histories, 1911-1991, Box 142

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "Box No. 494"
COLLECTION: Record Group 115, Entry 10
LOCATION: Project Histories, Feature Histories, and Reports, 1902-1932, Salt River
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "757-D1 Cooperation with Office of Indian Affairs. Gila River & Pima Ind. Res. Thru 1905."
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "118 SALT RIVER PROJECT. Settlement of Water Rights Thru 1913 118"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "118 SALT RIVER PROJECT. Settlement of Water Rights, 1914 thru June 1919 118"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "261 SALT RIVER PROJECT. Salt River Valley WUA, Thru May, 1903 261"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "27 SALT RIVER, Authorities for Construction."
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "305-15 SALT RIVER PROJECT. Misc. Water Supply for Lands of M.E. Braddock 305-15"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "54-B SALT RIVER. Lease of Water General 1911 Thru 1913 54-B"
COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "54-B3 SALT RIVER. Repayments: Corres. re: Furnishing Flood Waters to Water Users 54-B3"

COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineer Reports, January 1, 1907 - December 31, 1912."

COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineers Reports, January 1, 1913 - December 31, 1913"

COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT, Consulting Engineers Reports, January 1, 1914 - December 31, 1914."

COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Board of Survey Reports. 544-D"

COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Classification of Lands, Soil Surveys 559"

COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Corres. Re Board of Survey 544-D"

COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Corres. Re Board of Survey. Jan. 1, 1916 to 544-D"

COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER PROJECT. Water Appropriations"

COLLECTION: Record Group 115, Entry 3
LOCATION: General Administrative and Project Records, 1902-1919
ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER. Acquisition of Lands. ARIZONA WATER CO. JAN. 1906 THRU"

COLLECTION: Record Group 115, Entry 3

LOCATION: General Administrative and Project Records, 1902-1919

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "SALT RIVER. Payments under Public Notice INDIAN LANDS 559-A1-"

COLLECTION: Record Group 115, Entry 3

LOCATION: General Administrative and Project Records, 1902-1919

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "Salt River. Acquisition of Lands, Appropriators Canal Co."

COLLECTION: Record Group 115, Entry 3

LOCATION: General Administrative and Project Records, 1902-1919

ARCHIVE: National Archives-Rocky Mountain Region, Denver

FILE TITLE: "Salt River. Acquisition of Lands. ARIZONA WATER CO. THRU 1905."

COLLECTION: Record Group 115, Entry 3

LOCATION: General Administrative and Project Records, 1902-1919

ARCHIVE: National Archives-Rocky Mountain Region, Denver

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

U.S. Patents files, townships above Granite Reef Dam.

C. U.S. NATIONAL ARCHIVES, WASHINGTON, D.C., AREA

FILE TITLE: "Reclamation Bureau, Salt River Project, Withdrawals & Restorations, March 4, 1908 to March 18, 1913"

COLLECTION: Record Group 48, Records of the Office of the Secretary of the Interior

LOCATION: Box 1648, Central Classified File, 1907-1936, 8-3, Salt River Sentinel"

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Reclamation Service, Salt River Project, Contracts, General, from April 22, 1907 to January 20, 1910"

COLLECTION: Record Group 48, Records of the Office of the Secretary of the Interior

LOCATION: Box 1644, Central Classified File, 1907-1936, 8-3, Salt River C-F

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Reclamation Service, Salt River Project, General, September 28, 1907 to June 10, 1911"

COLLECTION: Record Group 48, Records of the Office of the Secretary of the Interior

LOCATION: Box 1645, Central Classified File, 1907-1936, 8-3, Salt River, Gen.-R.

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Rio Grande, Rouge Canyon, Sacramento Valley, Saint Mary's River, Salt River"

COLLECTION: Record Group 48, Records of the Office of the Secretary of the Interior

LOCATION: Box 41, Records Relating to Specific Reclamation Projects, 1889-1907, Entry 631

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Report on Underground Water Investigations Near Maricopa, Arizona, October, 1914."

COLLECTION: Record Group 75, Bureau of Indian Affairs

LOCATION: Classified Files, 1907-1939, Pima, 2868-16-341 Pts. 6 to 8

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "6629-12 Camp McDowell, File No. 341"

COLLECTION: Record Group 75, Bureau of Indian Affairs, Classification Files, 1907-1939, Salt River

LOCATION: Box 64268-20-321 - 97689-16-341

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Suit File, Sec. 26316-1912(?)"

COLLECTION: Record Group 75, Bureau of Indian Affairs, Classification Files, 1907-1939, Salt River

LOCATION: Box 64268-20-321 - 97689-16-341

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: illegible

COLLECTION: Record Group 75, Bureau of Indian Affairs, Classification Files, 1907-1939, Salt River

LOCATION: Box 64268-20-321 - 97689-16-341

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Report and Est, Irrigation System, Salt River, Jan. 17, 1917"

COLLECTION: Record Group 75, Entry 657, Bureau of Indian Affairs, Reports and Related Records, 1891-1946, Arizona: San Carlos Project, Salt River-Verde, 1910-41. Supplementary report on water Rights, Salt River Indian Res. to Brief to Buckeye Irrigation Co.

LOCATION: Box 49

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: "Report, Water Rights, Salt River Indian Reservation, Arizona"

COLLECTION: Record Group 75, Entry 657, Bureau of Indian Affairs, Reports and Related Records, 1891-1946, Arizona: San Carlos Project, Salt River-Verde, 1910-41. Supplementary report on water Rights, Salt River Indian Res. to Brief to Buckeye Irrigation Co.

LOCATION: Box 48

ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: Surveyor's Contracts

COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: none
ARCHIVE: U.S. National Archives, Washington, D.C.

FILE TITLE: Patent Files
COLLECTION: Record Group 49, U.S. General Land Office
LOCATION: none
ARCHIVE: U.S. National Archives, Washington, D.C.

D. WATER RESOURCES CENTER ARCHIVES, BERKELEY

FILE TITLE: An Economic Survey of Salt River Valley Project in Maricopa County, Arizona (1929)
COLLECTION: none
LOCATION: G 3562 E9
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: The Committee of Sixteen to the Salt River Valley Water User's Association
COLLECTION: none
LOCATION: none
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: 1500 Years of Irrigation History
COLLECTION: none
LOCATION: G 3562 G7
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: Address of Hon. Joseph H. Kibbey Delivered Before 15th National Irrigation Congress at Sacramento, CA., 09/04/1907
COLLECTION: none
LOCATION: G 3562 C7
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: U.S. Bureau of Reclamation, Salt River Valley Project, 1914-1915, Mead #30
COLLECTION: Elwood Mead Collection
LOCATION: 30
ARCHIVE: Water Resources Center Archives, Berkeley

FILE TITLE: Report Upon the Development and Distribution of the Water Resources of Salt River Valley, Arizona
COLLECTION: Joseph B. Lippincott Collection
LOCATION: 52-2
ARCHIVE: Water Resources Center Archives, Berkeley

E. THE BANCROFT LIBRARY, BERKELEY

FILE TITLE: 38 c

COLLECTION: David Myrick Collection

LOCATION: MSS 68

ARCHIVE: Bancroft Library

APPENDIX D – PUBLISHED SOURCES

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B. JOURNAL ARTICLES

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"Arizona & Nevada Railroad and Navigation," *The Railway Age*, VI (12/15/1881): 708.

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Barrows, H.D. "A Two Thousand Mile Stage Ride," *Historical Society of Southern California Quarterly*, III (02/04/1896): 40-44.

Jones, N.V. "The Journal of Nathaniel V. Jones, with the Mormon Battalion," in *Utah Historical Quarterly*, IV, no. 1 (01/01/1931): 3-24.

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APPENDIX E – RESUME OF DOUGLAS R. LITTLEFIELD

Douglas R. Littlefield, Ph.D.
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EDUCATION:

- Ph.D. American history. University of California, Los Angeles, 1987. Dissertation: "Interstate Water Conflicts, Compromises, and Compacts: The Rio Grande, 1880-1938." Fields: history of California and the American West, water rights history, legal history, environmental history.
- M.A. American history. University of Maryland, College Park, 1979. Master's thesis: "A History of the Potomac Company and Its Colonial Predecessors." Fields: business history, colonial history, early republic history, trans-Appalachian West history, British history.
- B.A. English literature. Brown University, 1972.

CONSULTING AND EXPERT WITNESS EXPERIENCE:

- 2005 – Present: Research historian and consultant for State of Colorado (Colorado Water Conservation Board). Providing historical research and documentation on the history of the 1922 Colorado River Compact, the 1948 Upper Colorado River Compact, Colorado River water rights, and related subjects.
- 2004 – Present: Research historian and consultant for City of Santa Maria, California (counsel: Best, Best & Krieger of Riverside, California). Providing historical research and documentation on the history of water rights of the U.S. Bureau of Reclamation's Santa Maria Project (California) for use in *Santa Maria Valley Water Conservation District v. City of Santa Maria, Southern California Water Company, City of Guadalupe, et al.*, Santa Clara County (California) Superior Court, Case No. CV 770214.
- 2004 – Present: Research historian and consultant for City of Pocatello, Idaho (counsel: Beeman & Associates of Boise, Idaho, and White & Jankowski of Denver, Colorado). Providing historical research and documentation on the history of Pocatello's water rights for use in Snake River Basin Adjudication (*In Re: the General Adjudication of Rights to the Use of Water From the Snake River Drainage Basin Water System, State of Idaho v. United*

States; State of Idaho; and all unknown claimants to the use of water from the Snake River Drainage Basin Water System), County of Twin Falls (Idaho) District Court, Case No. 39576.

- 2003 – Present: Research historian and consultant for U.S. Bureau of Reclamation (Mid-Pacific Region). Providing historical research and a report on the history of the water rights of the Friant Unit of the Bureau's Central Valley Project (California).
- 2002 Research historian and consultant for the Alameda County Water District (counsel: Hanson, Bridgett, Marcus, Vlahos & Rudy of San Francisco). Provided historical research and a report on the history of the water rights of the District.
- 2001 – Present: Research historian and consultant for Paloma Investment Limited Partnership (counsel: Mesch, Clark & Rothschild of Tucson, Arizona). Providing historical research (and deposed) regarding whether the Gila River was 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 extensive historical research and documentation on Zuni Indian water rights and land claims in Arizona and New Mexico for use in *In re the General Adjudication of All Rights to Use of Water in the Little Colorado River System and Source*, Apache County (Arizona) Superior Court, Case No. 6417.
- 2000 – 2001: Research historian and consultant for the Maryland Attorney General. Provided historical research and affidavit testimony on the 1785 "Mount Vernon" interstate compact between Maryland and Virginia for use in U.S. Supreme Court case of *Virginia v. Maryland*, No. 129 Original.
- 2000 Research historian and consultant for the Salt River Project, Arizona (counsel: Salmon, Lewis & Weldon of Phoenix, Arizona). Provided historical research and documentation on water rights of the Gila River, Arizona, for use in *In Re: The General Adjudication of All Rights to Use Water in the Gila River System and Source*, Maricopa County (Arizona) Superior Court, Case No. W1-203.
- 1998 – 2000: Research historian and consultant for the Idaho Attorney General. Provided historical research and report on whether the Salmon River and selected tributaries were 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 – Present: Research historian and consultant for City of Las Cruces, New Mexico (counsel: Stein & Brockmann of Santa Fe, New Mexico). Providing historical research and report on the City's water rights for use in *State of New Mexico v. Elephant Butte Irrigation District*.
- 1997 – 2003: Research historian and consultant for Fort Hall Water Users' Association, Idaho (counsel: Richard Simms of Hailey, Idaho). Provided historical research and report the Association's water rights in relation to the Shoshone and Bannock Indian land cessions on the Fort Hall Indian Reservation in Idaho for use in *Fort Hall Water Users' Association, et al., v. United States of America*, U.S. Court of Federal Claims, Case No. 01-445L.
- 1997 – Present: Research historian and consultant for Kern Delta Water District (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. Providing additional research and written reports on water rights for the remanded trial.
- 1996 – 1998: Research historian and consultant for Idaho Attorney General. Provided historical research and report on water rights in relation to the Deer Flat National Wildlife Refuge for use in Snake River Basin Adjudication (*In Re: the General Adjudication of Rights to the Use of Water From the Snake River Drainage Basin Water System, State of Idaho v. United States; State of Idaho; and all unknown claimants to the use of water from the Snake River Drainage Basin Water System*), County of Twin Falls (Idaho) District Court, Case No. 39576.
- 1995 – 1998: Research historian and consultant for U.S. Department of Justice. Provided historical documentation on the history of water rights on the Santa Margarita River at U.S. Marine Corps Base, Camp Pendleton, in southern California.
- 1995 – Present: Research historian and consultant for the Salt River Project (counsel: Salmon, Lewis & Weldon of Phoenix, Arizona). Providing historical documentation and reports

on whether the Salt, Gila, and Verde rivers were commercially navigable in 1912 when Arizona became a state. Testified in 1997 and 1998 before the Arizona Navigable Stream Adjudication Commission regarding the navigability of the Salt, Verde, and Gila rivers. Testified on the same subject in 1998 and 1999 before the Arizona State Legislature.

- 1995 – 2001: Research historian and consultant for Nebraska Department of Water Resources (counsel: Stein & Brockmann of Santa Fe, New Mexico). Provided historical documentation and report on water rights and the history of *Nebraska v. Wyoming*, 325 U.S. 589 (1945), for use in U.S. Supreme Court case of *Nebraska v. Wyoming*, Original No. 108, regarding the apportionment of the waters of the North Platte River. Deposed in that case, but the case was settled before trial.
- 1993 – 1994: Research historian and consultant for Simms and Stein, attorneys specializing in water law in Santa Fe, New Mexico. Provided historical documentation and affidavit testimony on Arapaho and Shoshone land claims and cessions along the Wind River in Wyoming for use in *In Re: the General Adjudication of All Rights to Use Water in the Big Horn River System and All Other Sources*, State of Wyoming.
- 1991 – 2003: Research historian and consultant for Legal Counsel, Division of Water Resources, Kansas State Board of Agriculture (counsel: Montgomery & Andrews of Santa Fe, New Mexico). Provided historical documentation and reports on water rights and history of apportionment of the Republican River and its tributaries among Kansas, Nebraska, and Colorado for use in U.S. Supreme Court case of *Kansas v. Nebraska and Colorado*, No. 126 Original, regarding the interstate apportionment of the Republican River.
- 1991 – 1993: Research historian and consultant for Nickel Enterprises (Bakersfield, California; counsel: Anthony Murray of Carlsmith, Ball, Wichman, Murray, Case, Mukai & Ichiki of Long Beach, California). Provided historical documentation and report on the navigability of the Kern River for use in *Nickel Enterprises v. State of California*, Kern County (California) Superior Court, Case No. 199557. Testified as an expert witness historian in this case for eleven days.
- 1989 – 1990: Research historian for Pacific Enterprises, Los Angeles, California. Directed historical research for and coauthored a corporate history of this southern California holding company entitled *The Spirit of Enterprise: A History of Pacific Enterprises, 1867-1989* (1990).
- 1988 – 1989: Research historian and consultant for Water Defense Association, Roswell, New Mexico (counsel: Simms & Stein of Santa Fe, New Mexico). Provided historical documentation of water rights claims along the Bonito, Hondo, and Ruidoso rivers in southeastern New Mexico for use in *State v. Lewis*, Chaves County (New Mexico), Case Nos. 20294 & 22600, Consolidated.
- 1986 – 1990: Research historian and consultant for Legal Counsel, Division of Water Resources, Kansas State Board of Agriculture (counsel: Simms & Stein of Santa Fe, New Mexico).

Provided historical documentation and report on water rights and interstate apportionment of the Arkansas River between Kansas and Colorado for use in U.S. Supreme Court case of *Kansas v. Colorado*, October Term 1985, Original No. 105, regarding the interstate apportionment of the Arkansas River. Testified as an expert witness historian for twelve days.

1986 – 1989: Research historian and consultant for Legal Counsel, State Engineer Office, State of New Mexico. Provided historical documentation and report on water rights in the Carlsbad Irrigation District in southeastern New Mexico for use in *State v. Lewis*, Chaves County (New Mexico) Case Nos. 20294 & 22600, Consolidated.

1986 – 1987: Historical consultant for *National Geographic Magazine*. Advised editors on June 1987 article, “George Washington’s Patowmack Canal.”

1984 – 1986: Research historian and consultant for Legal Counsel, State Engineer Office, State of New Mexico. Provided historical documentation and report on the history of water rights on the Rio Grande and interstate apportionment disputes between New Mexico and Texas for use in *El Paso v. Reynolds*, U.S. District Court, Civ. Case No. 80-730-HB.

OTHER PROFESSIONAL EXPERIENCE:

January 1992 – 1994: Member of Board of Editors of *Western Historical Quarterly*.

1991 – 1995: Lecturer, Department of History, California State University, Hayward. Taught a graduate seminar on environmental history and also taught survey courses on American history and California history.

1980 – 1984: Editorial Assistant, *Pacific Historical Review*. Edited scholarly articles and book reviews.

1979 – 1979: Lecturer, University of Maryland’s University College off-campus program. Taught courses on the history of the American West and U.S. History surveys.

PUBLICATIONS:

Books:

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

Articles:

“The History of the Rio Grande Compact of 1938,” in Catherine T. Ortega Klett, ed., *44th Annual New Mexico Water Conference – Proceedings – The Rio Grande Compact: It’s the Law* (Las Cruces: New Mexico Water Resources Research Institute, 2000).

- "The Forensic Historian: Clio in Court," *Western Historical Quarterly* (1994).
- "The Rio Grande Compact of 1929: A Truce in an Interstate River Apportionment War," *Pacific Historical Review* (1991).
- "Eighteenth Century Plans to Clear the Potomac River: Technology, Expertise, and Labor in a Developing Nation," *Virginia Magazine of History and Biography* (1985).
- "The Potomac Company: A Misadventure in Financing an Early American Internal Improvement Project," *Business History Review* (1984).
- "Water Rights During the California Gold Rush: Conflicts over Economic Points of View," *Western Historical Quarterly* (1983).
- "Maryland Sectionalism and the Development of the Potomac Route to the West, 1768-1826," *Maryland Historian* (1983).

Book Reviews:

- Sarah S. Elkind, *Bay Cities and Water Politics: The Battle for Resources in Boston and Oakland* (Lawrence: University Press of Kansas, 1998), in *Environmental History* (2000).
- David C. Frederick, *Rugged Justice: The Ninth Circuit Court of Appeals and the American West, 1891-1941* (Berkeley: University of California Press, 1994), in *Pacific Historical Review* (1995).
- Daniel Tyler, *The Last Water Hole in the West: The Colorado - Big Thompson Project and the Northern Colorado Water Conservancy District* (Niwot, Colorado: University Press of Colorado, 1992), in *Montana: The Magazine of Western History* (1994).
- Lloyd Burton, *American Indian Water Rights and the Limits of Law* (Lawrence: University Press of Kansas, 1991), in *Journal of the West* (1994).
- Zachary A. Smith, ed., *Water and the Future of the Southwest* (Albuquerque: University of New Mexico Press, 1989), in *Western Historical Quarterly* (1991).
- F. Lee Brown and Helen Ingram, *Water and Poverty in the Southwest* (Tucson: University of Arizona Press, 1987), in *The Public Historian* (1990).
- David J. Eaton and Michael Andersen, *The State of the Rio Grande/Rio Bravo: A Study of Water Resource Issues Along the Texas/Mexico Border* (Tucson: University of Arizona Press, 1987), in *New Mexico Historical Review* (1988).
- Pat Kelley, *River of Lost Dreams: Navigation on the Rio Grande* (Lincoln: University of Nebraska Press, 1986), in *Pacific Historical Review* (1988).

Marc Reisner, *Cadillac Desert: The American West and Its Disappearing Water* (New York: Viking Penguin, Inc., 1986), in *Environmental History Review* (1987).

Thomas F. Hahn, *The Chesapeake and Ohio Canal: Pathway to the Nation's Capitol* (Metuchen, N.J.: Scarecrow Press, Inc., 1984), in *Business History Review* (1987).

PROFESSIONAL AFFILIATIONS:

American Historical Association, American Society for Environmental History, California Committee for the Promotion of History, California Historical Society, National Council on Public History, Ninth Judicial Circuit Court Historical Society, Organization of American Historians, Western History Association, Western Council on Legal History.