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Fort Huachuca, Arizona

A Century of Development and Changing Missions
1877-1977

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EXECUTIVE SUMMARY

The San Pedro River valley, and ~~the~~ its surrounding mountains ~~that line it~~, was ~~the~~ home ~~of~~ to Native American ~~indigenous~~ Indian groups before the arrival of Spanish explorers. During the Spanish and Mexican periods, frequent raids by Apaches and other Indian tribes made the area ~~a kind of~~ essentially a no-man's-land. Following ~~its~~ the acquisition by the United States in 1854, through the Gadsden Purchase, the responsibility for control in this region fell to the U.S. Army. During the decades that followed, the army established frontier posts ~~from which~~ to exert ~~some~~ control over the remote area.

During the course of the Apache Wars, the army established Camp Huachuca in the Huachuca Mountains of San Pedro Valley in 1877. An executive orders in 1881 set aside the reservation "for military purposes." A second executive order in 1883 expanded the boundaries to include additional grazing land. The 1883 boundary remained unchanged until World War II when the East (Artillery) Range was added. During its formative years, Fort Huachuca served several military purposes: to control continuing Indian disturbances; to patrol the international border; to facilitate location and construction of a railroad linking Tucson to the Pacific Coast to the west, El Paso and Albuquerque to the east, and the port city of Guaymus, Mexico to the south; and to protect ranchers and miners on a sparsely settled frontier.

During the early years of its existence Fort Huachuca relied on wells sunk in Huachuca Creek and development of springs in Huachuca Canyon for its water supply. Abundant when rainfall was plentiful and inadequate in times of drought, assuring sufficient supply was a constant concern. By the 1884 the fort had a gravity flow system that piped spring water to a 250,000 gallon storage reservoir on the ridge above the Old Post. By 1892 the average daily consumption at the post was approximately 85,000 gallons per day. Fort Huachuca managed with this system until 1911 despite variations in post population, often employing strict controls over water use in dry seasons to assure water for domestic use and fire fighting.

As the post grew after 1900 to train troops to fight in the Philippines and later to control the U. S. border during a prolonged period of revolutionary strife in Mexico, the army decided to augment its water supplies, first by tapping springs in Garden (Tanner's) Canyon, nine miles

to the southeast. This development probably doubled the fort's overall supply, but did not solve the problem of periodic shortage because, like the springs in Huachuca Canyon, the new sources were also subject to the vagaries of climate. By the mid-1920s the average daily water requirement at the post had risen to about 300,000 gallons per day. It was not until 1939-1940, when the post drilled two deep wells (with a combined capacity to deliver about 1,725,000 gallons per day) near the eastern border of the reservation at Fry that the fort began to attain a sure and steady supply. In association with this development the post constructed a pipe line from the new well field to the old post reservoirs and added another 250,000 gallon storage unit.

During WWII Fort Huachuca served as a training facility for two divisions, the 92nd and 93rd Infantry. By the end of 1942 the maximum daily water use had reached 2,603,000 gallons per day and averaged 2,124,000 gallons. In 1942 and 1943 the army sank three additional deep wells along the eastern boundary of the military reservation (each with approximately a 1,000,000 gallon per day capacity) and erected three additional reservoirs (two tank towers with 500,000 gallon capacity each, and one ground level tank with a three million gallon capacity) to serve a post military population of 42,500.

The end of WWII led to a period of change for the military at Fort Huachuca. Demobilization led military planners to contemplate deactivation or disposal of forts and other facilities that had once been centers of great activity and that had great economic impact on surrounding communities. Fort Huachuca was one such post. In the years between WWII and the outbreak of the Korean War (1945-50) the federal government deactivated the post, declared it surplus (1947), and transferred it to the State of Arizona for the use of the Game and Fish Commission as a wildlife refuge and the Arizona National Guard as a training facility (January, March 1949; April 1950). The deeds effecting transfer had recapture clauses and other stipulations that retained for the federal government a measure control over the fort. The area controlled by the Arizona Game and Fish Commission (essentially all of undeveloped area of the original post) was recaptured by letter in January 1951; the federal government reacquired

the Old Post and Cantonment area through a quitclaim deed in September 1954, although the army had recaptured exclusive use in January 1951. Since its recapture it has remained in federal hands.

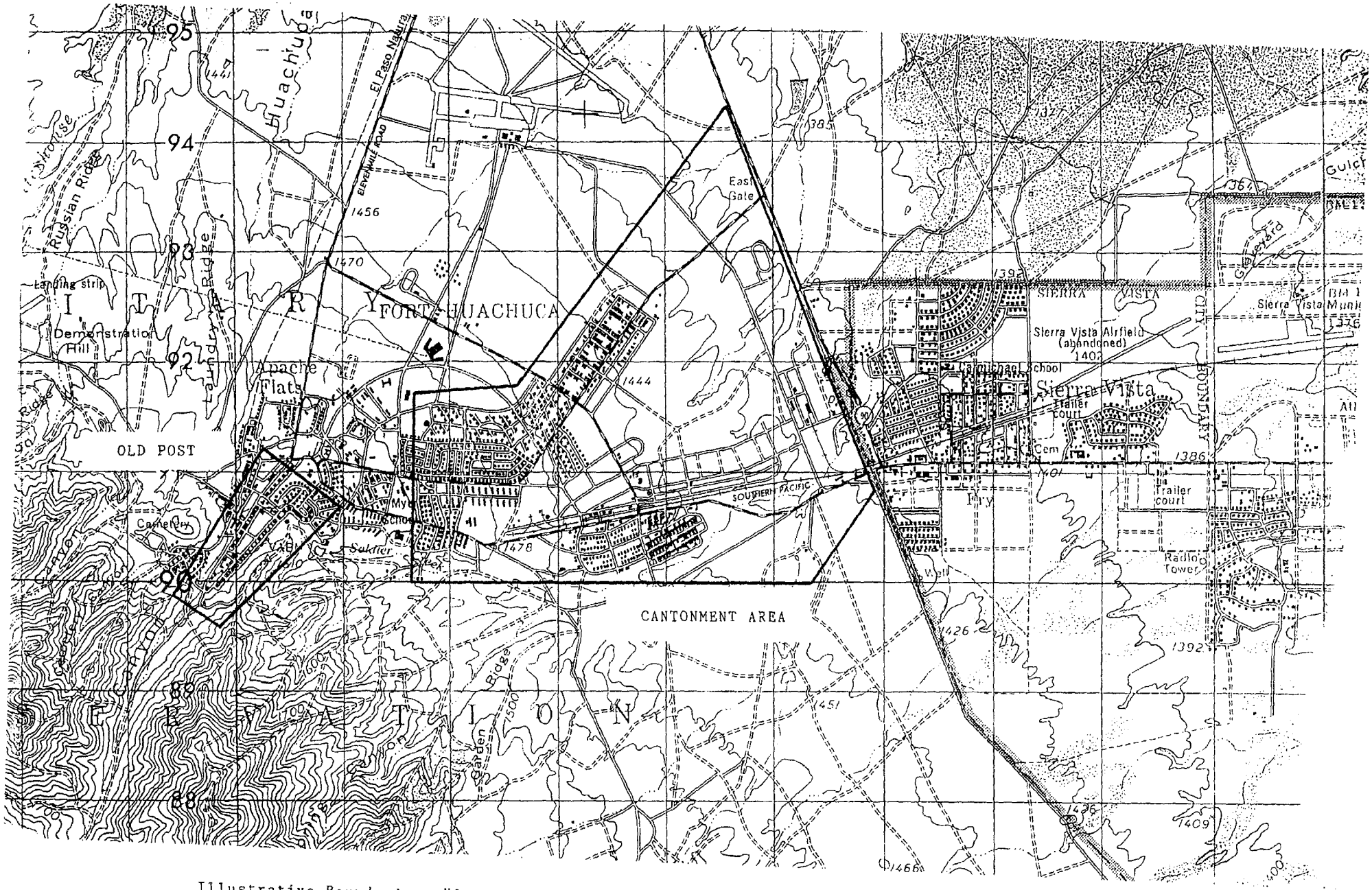
The needs of the military in 1951 during the Korean War were the reasons for its recapture under provisions of the deeds to the state in 1949. During the period of state control, January 1949 through January 1951, the cantonment (built-up) portion of the fort was under the control of the Arizona National Guard, as specified in the deed that it be used for "military purposes" for the first 20 years. While portions of the post were leased -- particularly residences or other buildings -- and other items were sold (buildings and equipment), all proceeds went into the National Guard fund for use at the fort. At least for the National Guard portion of the post, military use has been constant. During the Korean War the post was used primarily for training aviation engineer units.

The state's issuance of the quitclaim for the remainder of its land in the East Range in 1957, combined with dedication of federal public lands to use by the US Army Electronic Proving Ground (USAEPG) completed a long process of deactivation, disposal, reactivation and reacquisition begun in 1946. The fort became established as a permanent and important installation of the Signal Corps after 1954.

Fort Huachuca's reactivation and eventual reacquisition by the Army between 1951 and 1954 has led to its permanent use as the USAEPG and for other purposes. Location of ~~the US Army Electronic Proving Ground~~ (USAEPG) at Fort Huachuca in 1954 heralded a shift at the fort to an emphasis on development and testing of electronic devices to be used in the national defense; although training soldiers in their maintenance and use in a variety of conditions also played an important role. Further, with the arrival of ~~the~~ USAEPG came changes in the physical plant. Besides field testing requirements, ~~the~~ USAEPG also needed additional large barracks, classrooms, offices, and laboratory complexes. As other new tenant units arrived, post planners built the additional structures needed. Longer-term assignments during peacetime resulted in the need for housing for both military and civilian personnel and their families. Sierra Vista grew with the influx of civilian workers; so too grew the number of housing units on

post. These changes led to a recurring concern over the adequacy of the post's water supply.

Fort Huachuca undertook consideration of several means to adjust its water supply system to the growth experienced between its reactivation in 1954 and 1978. These adjustments took the form of additional development of springs in Garden and Huachuca canyons, increased reservoir capacity, changes in the distribution system, and installation of new wells in the East Range. During this period the number of dwellings on the post grew dramatically, as did housing in barracks and BOQs, so the kind of domestic water use changed at the same time the numbers of those making use of post supplies grew. Increases in total water consumption grew with population, and can be seen in the following table. The difference between 1956's 447.005 million gallon annual consumption and 1984's 1,000.78 million gallons is striking -- an increase of 224% -- but in terms of gallons per capita per day (173 v. 179, respectively) the difference is relatively small. At the same time the post experienced, perhaps simply coincidentally, an identical population growth rate of 224%, from 7,086 to 16,154. Between 1956 and 1984 average per capita daily consumption has ranged between 148 and 219 gallons, and reached a height of 1.0684 billion gallons in 1969. Fluctuations can be affected by weather patterns, population, or changes in use. Innovations such as the application of treated sewage effluent for golf course and parade ground irrigation the fort demonstrated conservative use of an available resource, and have helped augment available supply. Nevertheless, by 1978 the post was also faced with the need to replace or refurbish wells supplying potable water.



Illustrative Boundaries, "Old Post" and "Cantonment" Areas
Fort Huachuca

USFH-00002488

Water Consumption, Fort Huachuca, 1956-1972, 1982-1989
[in millions of gallons][1]

Year:	Average Day	Maximum Day	Year Total	Population*
1956	1.226	2.622	447.005	7,086 (173 gpd/c)**
1957	1.524	3.207	556.121	8,800 (173 gpd/c)
1958	1.874	3.460	683.968	11,000 (170 gpd/c)
1959	2.055	3.540	750.228	
1960	2.200	4.205	802.806	13,117 (168 gpd/c)
1961	2.250	3.990	821.217	13,296 (169 gpd/c)
1962	2.476	4.461	903.730	11,326 (219 gpd/c)
1963	2.187	4.416	798.217	12,000 (182 gpd/c)
1964	2.115	4.020	771.858	
1965	2.530	3.580	912.366	13,000 (192 gpd/c)
1966	2.398	4.464	863.532	
1967	2.363	5.16	862.625	16,000 (148 gpd/c)
1968	2.837	5.00	1,032.022	
1969***	2.930	5.02	1,068.446	
1970	2.724	5.30	994.367	
1971	****	5.22	****	
1972	****	5.34	****	

1973-1981: no figures found.

1982	2.44	****	891.502	
1983	2.58	****	937.042	
1984	2.74	****	1,000.780	16,154 (Jan.) 179 gpd/c
1985	2.67	****	972.903	
1986	2.59	****	944.207	
1987	2.03	****	740.676	
1988	2.86	****	1,043.198	
1989	2.32	****	847.522	

* [Population statistics derived from estimates, letters, fact sheets, reports, and other sources taken at different times of the year, independent of water consumption figures, and are included for comparison only.]

** [Gpd/c = gallons per day per capita, derived by dividing annual total consumption/365/post population.]

*** [Consumption peak, also passes peak WWII (1944) level.]

**** [Figures unavailable.]

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[1]Fort Huachuca, "Water Development Canyons and Water Conservation," Military Construction Line Item Data, 4-24-1967, section C.1. Hayden Collection, 306/25 #9, Arizona Collection, ASU, 20-0126. This project line item was for $1.754 million. Annual well production figures for 1982-1989 contributed by Ft. Huachuca DEH, February 1990. 11-0082.

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INTRODUCTION

Southeastern Arizona has three large and important valleys, all trending in a north and south direction and extending from south of the Mexican border nearly to the Gila River. Two well-marked mountain ridges and one broad belt of mountains and table-land separates the valleys. The first beginning in the east, is Sulphur Spring Valley. Lying to the westward and nearly parallel with it but separated by the Galliuro, Limestone, Dragoon and Mule Pass Mountains, is the valley of the San Pedro. West of the San Pedro, and between it and the Santa Cruz, is a belt of mountain and table-land, from thirty to forty miles, made up, at the south, of the Huachuca, Patagonia and Harshaw Mountains and farther north, of the Whetstones and Santa Ritas. Fort Huachuca lies on the north and northeastern flank of the Huachuca Mountains within the San Pedro watershed.

The San Pedro River flows northward from its headwaters about twenty-five miles south of the international boundary in Sonora, Mexico, and crosses into Arizona just south of the Palominas. The river enters the United States at an altitude of 4275 feet and joins the Gila River at Winkleman at the 1920 feet elevation. Most of the mountains bordering the San Pedro Valley rise to altitudes of greater than 6,000 feet. The highest point is Miller Peak in the Huachuca Mountains, at elevation 9,466. The river drains an area of approximately 4,500 miles, all but about 15% of which is within the United States.[1]

Between 1540 and 1598 several Spanish exploring parties visited the

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[1]Henry P. Walker and Don Bufkin, *Historical Atlas of Arizona* (Norman: University of Oklahoma Press, 1979), pp. 1-6; Report of Reconnaissance by Carl F. Palfrey, First Lieutenant of Engineers, to Engineer's Office, Headquarters, Department of Arizona. March 31, 1881. Printed copy in Records of Adjutant General's Office; RG 94, Box 52, 2358 AGO 1881. 01-0031.

Pueblo farmers of the Rio Grande, as well as the desert irrigation Sobiapuri and Pima farmers of southern Arizona and the Yuman-speaking floodwater farmers of western Arizona. The Sobiapuri and Pima were river-dwelling people who lived at Bac on the Santa Cruz River and along the San Pedro. At the time of Padre Eusebio Francisco Kino's visit to the San Pedro Valley in 1697, an estimated 2,000 Indians lived in the valley in some 15 villages and raised cotton, maize, beans, squash, and melons on the bottomlands using water diverted from the river to irrigate their crops.[2]

Over the decades the Spanish developed a network of missions, towns, farm villages, and ranches along the Rio Grande and Gila rivers. But the Spanish never had the manpower or resources to fully occupy their northern frontier and their tenure was always uneasy and hazardous. In one concerted Pueblo uprising in 1680, for example, the Spanish were driven completely from the upper Rio Grande. The two main thrusts of Spanish colonization into the Southwest was up through the Rio Grande into New Mexico as far north as Taos and northward up the Baja Peninsula to San Francisco Bay in Alta California. Eventually the Spanish established a presidio, missions, and ranches along the Santa Cruz River as far north as Tucson, but the broad, mountainous and deeply dissected plateau country between the Rio Grande and the Gila was the great stronghold of the Apache Indians whose resistance reinforced the physical separation of the two main avenues of Spanish advance.

During the 1690s a vanguard of southern Gila Apaches, in company with other tribes from northern Mexico and southeast Arizona, began moving south attacking Opata Indians in Sonora, the Sobiapuri Indians along the upper San Pedro River of present southeastern Arizona, and the Spanish

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[2]Herbert E. Bolton, *Rim of Christendom: A Biography of Eusebio Francisco Kino, A Pacific Coast Pioneer* (Tucson: University of Arizona Press, 1984), p. 362-367.

mission ranches which were expanding into the southernmost sources of the Gila River and the deserts to the west at that time. By the early decades of the 1700s, the Apaches had penetrated far enough south to use the Chiricahua Mountain area as a home base. Even the more northern Gila Apaches opened up routes to the south via the San Francisco River to raid the Sobiapuri country. By 1762 the Sobiapuri were unable to withstand these Apache assaults from the north. They abandoned the fertile San Pedro Valley and joined their Pima relatives near and west of present day Tucson, and south with related groups in Mexico. By this time the vigor of Spanish expansion had also passed, leaving the Spanish only the most precarious of footholds against the Apaches.[3]

When the northern provinces of New Spain passed from Spanish to Mexican control in 1821 authorities tried to reassert their influence in the northern province of Sonora. They were faced with two related problems: how to distribute the land and how to control the nomadic and warlike Apache Indians who demonstrated no inclination to become shepherds or sedentary farmers and had completely intimidated earlier colonization efforts in Sonora. On December 25, 1832 the Mexican government granted land in the Huachuca area to Ignacio Elias for the purpose of grazing his stock. This land grant was known as San Ignacio del Babocomari. Soon thereafter, in 1835, the Sonoran government announced the establishment of the *Proyecto de Guerra* to deal with marauding Indians. Although a few large land grants were made and several ranches begun in the upper Santa Cruz and San Pedro basins

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[3]Paul H. Ezell, "History of the Pima," in William C. Sturtevant, ed. *Handbook of the North American Indians: Southwest* vol. 10 (Washington: Smithsonian Institution, 1983), pp. 149-166; Albert H. Schroeder, "Shifting for Survival in the Spanish Southwest," in David J. Weber, *New Spain's Far Northern Frontier: Essays on Spain in the American West, 1540-1821* (Albuquerque: University of New Mexico Press, 1979), pp. 237-256; Charles C. Di Peso, *The Sobaipuri Indians of the Upper San Pedro River Valley, Southeastern Arizona.* (Dragoon, Arizona: The Amerind Foundation, Inc., 1953), pp. 1-48.

during the Mexican Period, there were too few settlers to hold the ground. By the 1840s, the Apaches had driven off nearly all the cattle and most of the people, leaving no more than perhaps 1000 Hispanics and Christianized Indians concentrated around Tubac, Tucson, and San Xavier del Bac.[4]

The commercial repercussions of the 1821 shift in political control over the region that would become Arizona were profound. Spain had rigidly restricted trade on its northern frontier, but Mexico was eager for foreign commerce. Trade routes opened up during the 1820s between the Anglo-American frontier and the Hispanic frontier by way of the famous Santa Fe Trail. The aggressive tentacles of Anglo-American commerce soon extended across the continent to California forging a lateral link between the two settled provinces of northern Mexico. By the 1840s the trade of Santa Fe was so enlarged and extended as to become a rivalry between eastern America and central Mexico for the trade of the entire northern Mexican region.

From 1821 to 1846 annoying commercial incidents had arisen between the United States and Mexico. The Mexican government also accused the United States of engineering the Texas revolution and subsequently planning the annexation of the northern Mexican states. War broke out between the two countries in 1846 and resulted in the American conquest of California and New Mexico. The Treaty of Guadalupe Hidalgo, signed by the United States and Mexico in 1848, redefined the political boundaries in the Southwest. West of the Rio Grande the new international boundary established by the

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[4]Edward H. Spicer, *Cycles of Conquest: The Impact of Spain, Mexico, and the United States on the Indians of the Southwest, 1533-1960* (Tucson: University of Arizona Press, 1962), passim; Leroy R. Hafen and Carl Coke Rister, *Western America: The Exploration, Settlement, and Development of the Region Beyond the Mississippi* (New York: Prentice-Hall, Inc, 1941), pp. 252-262; Bert Haskett, "Early History of the Cattle Industry in Arizona," *Arizona Historical Review*, 6:4 (October 1935), p. 7.

treaty reflected the northern limits of effective Spanish and Mexican advance. An arbitrary line was drawn due west to intersect the easternmost tributary of the Gila and hence along the Gila River to the Colorado. This left Tucson, the northern outpost of Sonoran settlement within Mexico.[5]

Before surveyors could even mark the new boundary, the gold discovery in California sent thousands of Americans streaming across the northern margins of Mexico bound for the gold fields. Much of the vast western semi-arid region from the 49th parallel south to the Mexican border was occupied by Indians. The Americans looked upon the Pueblo Indians, who lived in organized communities and were dependent on agriculture for subsistence, as "civilized Indians." Quite different were the "wild" Apaches and Navajos, who lived by tending their sheep and raiding Mexican settlements. The Apaches presented a huge problem for the American government which tried to prove its superiority over the Mexican government by extending ~~the~~ military protection ~~which~~ to the peaceful inhabitants of the region which they had never received under Mexican rule. The Treaty of Guadalupe Hidalgo did not greatly alter the military picture. Article XI of the treaty provided that the United States would stop Indian raids into Mexico and had given the United States the power to pursue Apaches crossing the international boundary. In compliance with this article, the United States government organized the Ninth Military District in 1848.

United States military policy for New Mexico Territory called for a display of military force that would end Indian depredations, followed by settlement of the Indians on reservations. The plan depended on military

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[5]George L. Rives, *The United States and Mexico: 1821-1848*, 2 vols. (Baltimore: C. Scribner's Sons, 1913); Frederick Mark, *Manifest Destiny and Mission in American History* (New York: Vintage Books, 1966), pp. 24-60.

force to keep the Indians on their reservations, and the establishment of military posts in Indian country. The United states government found the Mexican Cession country hard to control. In the territory of New Mexico (which included Arizona) from 1851 to 1863 from 1,400 to 1,800 troops were distributed among eight forts. Army patrols were constantly sent out to escort emigrants through the region or to protect isolated settlements against roving bands of Indians.[6]

During the 1850s the United States was seeking the most desirable route for a transcontinental railroad and one potential area lay south of the Gila River where the terrain was more level than further north. President Franklin Pierce instructed the U.S. Minister to Mexico, James Gadsden, to confer with Mexican officials about the purchase of land to ensure American control of key features including Guadalupe Pass and several roads threading the ranges through the San Pedro and Santa Cruz Valleys. On December 30, 1853, Mexico and the United States ratified the Gadsden Purchase. President Franklin Pierce signed the treaty on April 25, 1854. The agreement shifted the international boundary south capturing the old Hispano-Indian settlements along the Santa Cruz Valley and much of the San Pedro Valley. The Gadsden Purchase treaty eliminated the responsibility of the United States to prevent raids into Mexico, but the new territory also included more western Apaches within the boundaries of the United States. These Indians were not amenable to the goals of American Indian policy.[7]

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[6]Francis Paul Prucha, *The Great Father: The United States Government and the American Indians* (Lincoln: University of Nebraska Press, 1984), pp. 270-380.

[7]Robert Edgar Riegel, *The Story of Western Railroads, from 1852 Through the Reign of the Giants* (Lincoln: University of Nebraska Press, 1964), pp. 12-16; Hafen and Rister, 1941, pp. 322-343, 498-501; William H. Emory, who made the military survey of the Gadsden Purchase in 1853, noted

During the next twenty years the United States government was primarily concerned with establishing a government and a military organization in the newly-acquired region. The Gila River country, a huge block of diverse and difficult land, was occupied by many Indians, few Hispanics, and fewer Americans. Anglos filtered in as soldiers and traders, and then later as ranchers and farmers. In all, eleven new military posts were built in Arizona south of the Gila between 1856 and 1876. The vast majority did not last for more than a few years. As early as 1857 President Buchanan recommended that Congress carve out a separate Territory of Arizona to manage political affairs in western New Mexico, but Congress rejected his proposal. Arizona did obtain independent territorial status in February 1863. Between 1866 and 1872 temporary reservations were set up for some bands of Apaches on the military reservations at Camps Goodwin, Grant, McDowell, Beale Springs, and Date Creek, but the Apaches of the Southwest rejected reservation life. They remained restless, constantly leaving their reservations to renew raiding in Mexico and throughout the Southwest. Several military campaigns were organized to subdue them and return them to the reservations. Major General George Crook's vigorous campaign against the Apaches in 1871-72 brought a degree of order to the chaotic conditions in Arizona and led to the establishment of the San Carlos Indian Agency on the Gila River, where the Chiricahua Apaches were moved in 1876. But Apache raids continued, leading to long and weary guerilla conflict with the U.S. Army that lasted until 1886 when Geronimo and the last of the

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in his journal that the San Pedro Valley had fine agricultural land, but the only settlements were ruins of old towns destroyed by hostile Indians long ago. William H. Emory, *Report on the United States and Mexican Boundary Survey made under the direction of the Secretary of the Interior*, vol. I (Washington, DC: Cornelius Wendell, Printer, 1857), p. 94.

hostile Apaches finally surrendered.[8]

During the course of the Apache Wars, the army established Camp Huachuca in the Huachuca Mountains of San Pedro Valley. The location served several military purposes: to control continuing Indian disturbances; to effect a stronger military presence along the international boundary; to facilitate location and construction of a railroad linking Tucson to the Pacific Coast to the west, El Paso and Albuquerque to the east, and the port city of Guaymus, Mexico to the south; and to protect ranchers and miners on a sparsely settled frontier.

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[8]Robert M. Utley, *Frontier Regulars: The United States Army and the Indian, 1866-1891* (New York: Macmillan Company, 1973), pp. 369-396.

ESTABLISHMENT OF THE FORT HUACHUCA MILITARY RESERVATION, 1877-1884

Founding of Camp Huachuca

On December 2, 1876 Colonel A. V. Kautz, operating from Headquarters, Department of Arizona, received a telegram from Tucson sent by Samuel Hughes stating "The Apaches have taken 21 head of horses and colts from Old Camp Crittenden [in the Santa Cruz Valley]. My brother followed the trail in the direction of Huachuca Mountains. An Indian Scout kept in active service in that section would give protection and soon subdue the Indians if in charge of an energetic experienced officer. The people desire me to ask if you can aid them, if not, the stock of San Pedro, Senorite Barbocomori [sic.] and other ranches must be removed."[1] Immediately the Assistant Adjutant General at Prescott notified Hughes that a "company of scouts from Bowie has been ordered into the field."[2]

Four days later approximately thirty citizens sent a petition to Colonel Kautz stating:

> The undersigned residents of Santa Rita, Old Camp Crittenden, Babocomari, Senvite and the French mine beg leave to represent that we live near the Mexican line and are constantly in danger of being robbed by Mexican outlaws. The roaming Apaches have committed frequent depredations in this section and within a

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[1]Samuel Hughes to Colonel Kautz, December 2, 1876. Records of Adjutant General's Office; RG 94, Box 52, 4/447 AGO 1877. 01-0037.

[2]J. P. Martin to Samuel Hughes, December 2, 1876. Records of Adjutant General's Office; RG 94, Box 52, 3/447 AGO 1877. 01-0038.

> few days have taken a number of horses from Old Camp Crittenden and we fear until a military force is permanently located on the upper San Pedro or about the Huachuca mountains that said Indians will continue to commit depredations.
>
> In view of these facts we respectfully ask you to consider the propriety of establishing a military post as above indicated.[3]

Kautz replied to the petitioners that limited congressional appropriations, and laws prohibiting expenditure of public funds for purposes other than for which they were designated, made it impossible for him to grant their request at that time. However, he assured the citizens of Santa Rita that their petition would be forwarded to the War Department with a recommendation that Congress be solicited to appropriate funds for the establishment of a new post. Kautz noted that he had already reported on the growing need for troops on the border and would have opened a camp in the vicinity of the Huachucas except that forage was so limited that the ranchers in that area could barely keep their animals alive. In the meantime, the best he could do was to send a company scouts into the area in search of the outlaws.[4]

Kautz forwarded the Santa Rita citizen's petition to the Secretary of War through the Military Division of the Pacific, adding the endorsement, "I have heretofore called attention to the growing necessity for troops on the border. The necessity is liable at any time to become imperative. Since the removal of the Chiricahua Indians a great many depredations have been committed and several men have been [killed]." He suggested that Congress be solicited to appropriate $20,000 for the establishment of a

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[3]Petition to General A. V. Kautz, Santa Rita, A.T., December 6, 1876. Records of the Adjutant General's Office; RG 94, Box 52, 447 AGO 1877. 01-0039.

[4]Kautz to B. F. Campbell and others, December 26, 1876. Records of Adjutant General's Office; RG 94, Box 52. 01-0036.

camp or post, near the Sonora line in southeastern Arizona. General McDowell of the Division of the Pacific forwarded the request stating he had previously recommended that a military post be established in the area recommending Babocomari as one of the healthiest places in that part of the territory, only to learn that it was on a Spanish land grant. He recommended favorable consideration of the petition, preferably Babocomari, if a suitable site for the post could be had in advance. General W. T. Sherman, Headquarters of the Army, disapproved the creation of any new posts in Arizona. He suggested that General Kautz with his regiments, one of cavalry and one of infantry, could adequately defend "what interests exist in Arizona." Sherman thought it was "the height of absurdity to build posts at $20,000 to protect an interest of 5 or 10 dollars."[5]

Colonel Kautz issued Special Order 14 on February 12, 1877 stipulating that two troops of cavalry under the command of Captain Samuel Marmaduke Whitside, stationed at Fort Lowell, would proceed to vicinity of Old Camp Crittenden and establish a camp to protect the settlers in the San Pedro and Santa Cruz valleys. Captain William A. Rafferty, from Camp Grant, accompanied the exploring party. A thirty-day supply was drawn by each company.[6] Working in a southeasterly direction the column passed the Whetstone Mountains arriving in the upper San Pedro Valley at the ruins of old Camp Wallen, built in May 1866 by men of the California Column commanded by Brigadier General James H. Carleton. Whitside found that Mexican sheepherders, employees of the San Ignacio del Babocomari Ranch, were living in the ruined adobes. Whitside moved eight miles further south

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[5]Endorsement letter to Kautz, December 6, 1876. Records of Adjutant General's Office; RG 94, Box 52, 477 AGO 1877. 01-0039.

[6]Special Orders, No. 14, issued by command of Colonel A. V. Kautz, Headquarters Department of Arizona, February 12, 1877. Records of Adjutant General's Office; RG 94, Box 52. 01-0045.

to the base of the Huachuca mountains. There, at the mouth of Huachuca Canyon, where a lively mountain stream ran with pure water he made his camp on March 3, 1877. Whitside made inspection trips of all the neighboring canyons, dispatched a scouting party to scan the region from Sentinel Peak, and concluded that no better spot could be found. The mouth of Huachuca Canyon possessed several qualities that made it a suitable site for a permanent camp: it was on elevated ground, possessed an abundant supply of good water, had good grass for grazing animals, and it was sheltered by ridges on three sides. Old cottonwoods and sycamores lining the creek provided shade during the hot summer months and the mountains contained forests of pine to provide lumber for building. Whitside called the site Camp Huachuca.

Shortly after establishing the camp, Whitside initiated a system of cavalry patrols covering a radius of about forty miles from camp. With observation posts he was able to provide relative security for the settlers in the area. Trouble developed when Mexican bandits began raiding north of the border and Captain Rafferty was sent to run them down. When he caught up with the desperadoes and killed a number of them in battle, the Mexican government protested against the "invasion."[7]

As early as April 1877 Lieutenant Robert Hanna reported on continuing depredations by the Indians and asked General Sherman to reconsider his decision, concurred in by the Secretary of War, against the establishment of a permanent post in southeastern Arizona. The Adjutant General forwarded General Sherman's response to the Commanding General of the Military Division of the Pacific who had earlier endorsed Hanna's request.

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[7]Cornelius Smith, *Fort Huachuca: The Story of a Frontier Post* (Fort Huachuca, Arizona, 1978), pp. 17-18.

> There is no objection to exploration and recommendation, but the Secretary of War should not encourage a waste of money by building forts one year to be abandoned the next.
>
> My advice is to get along with what forts we have until the Texas Pacific Railroad is located, in that the posts will be along it instead of being left away to one side like Fort Halleck in Nevada. On my map are three abandoned forts in southeastern Arizona viz. Old Fort Mason, Camp Crittenden and Camp Wallen. If the troops are needed in that quarter let them bivouac till experience shows the country to be inhabitable.
>
> This is all I meant by forbidding any new posts in that region without a full understanding of a permanent necessity.
>
> W. T. Sherman
> General[8]

Hanna arrived in May in command of a company of Indian scouts from Camp Grant to join the cavalry troops at Huachuca. He launched a campaign against the Apaches but confined his operations to north of the Mexican border. He was joined in this August campaign by Lieutenant John Anthony Rucker with 18 men from the 6th Cavalry and a company of Hualpai scouts. The reinforced column was in the field for several weeks, often suffering from lack of food and water, but finally engaging the Apaches in a running fight in which 10 Apaches were killed and 13 taken prisoner. After 22 days Hanna's men gave up the chase.[9]

Within months of the establishment of the army camp, a group of farmers came to settle the valley. In November 1877 they arrived with their families from a Mormon colony at Mesa near Phoenix to establish an irrigation outpost on the San Pedro River. A Mormon colony, known as St. David,

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[8]Second Endorsement by W. T. Sherman submitted to Secretary of War May 1, 1877 explaining his early comments referred to by Major General McDowell, Commanding Officer of the Pacific. Records of Adjutant General's Office; RG 94, Box 52, 447 AGO 1877. 01-0024.

[9]Smith, Cornelius C., Jr. *Fort Huachuca: The Story of a frontier post.* Fort Huachuca, Arizona, 1978, pp. 19-21.

was established the following May -- the southernmost American settlement in Arizona. Other ranchmen followed into what is now Cochise County by 1880, among them were Brannick Riggs on the west side of the Chiricahuas, Rockfellow and Servoss near the Cochise stronghold, the Munk Brothers in the vicinity of Railroad Pass, and Dan Murphy on the San Pedro south of Mammoth.[10] On December 21, 1877 Captain Whitside moved to stake out his claim and reserve critical resources on behalf of the army. He announced the limits of Camp Huachuca subject to the approval of the Commander of the Arizona Department in Prescott:

> Beginning at the Cemetery of Old Camp Wallen thence on a line due south through the western canon of the Huachuca Mts., to its intersection with a line running east and west through terminus of military road to the pinery, thence east nine miles to intersection with north and south line running one mile and a half to the westward of eastern canon of Huachuca Mountains, thence north to intersection with line passing due east from cemetery of Old Camp Wallen, thence to point of starting.
>
> The above described limits nine miles square ~~[54,040 acres]~~ [area 81 square miles], are plainly marked, and are set aside for the benefit of the United States, until such time as a military reservation shall be declared.
>
> All persons are forbidden to erect buildings, establish camps, or herd stock or cut timber within the boundary mentioned.[11]

Whitside's order, General Order No. 91, was returned from Headquarters, Department of Arizona with an endorsement from the commanding general approving the

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[10]Kirk Bryan, et. al., *Groundwater Supplies and Irrigation in San Pedro Valley, Arizona* (manuscript, 1934), p. 24.; Frank C. Lockwood, *Pioneer Days in Arizona, from Spanish Occupation to Statehood* (New York: The Macmillan Company, 1932), pp. 235-242.

[11]Order No. 91, December 21, 1877. Records of Adjutant General's Office; RG 94, Box 52, 2300 AGO 1879. 01-0026.

Lieutenant H.F. Winchester reported in April 1878 on his reconnaissance of the region south & east of Camp Huachuca in San Pedro Valley that agriculturalists, prospectors, and agents of capitalists arrived in the region "contemporaneously with the establishment of Camp Huachuca." They felt "perfectly assured of safety from molestation by hostile Indians on account of the presence of troops at Camp Huachuca." Without the camp, Winchester noted that these people would "in all probability abandon their settlement of the valley & occupation of Southeastern Arizona would be "delayed indefinitely by the inevitable raids of the yet unreserved wild Indians." Winchester to Lieut. Louis A. Craig, April 20, 1878. Entry 8, Letters Received, Vol. 1. Records of the Army Continental Commands, RG 393 01-0698.

measure "until such time as a Reservation can be surveyed for a camp, and set apart by the proper authority."[12]

In March 1879, controversy developed over the creation of the boundaries proposed in Order No. 91. The Assistant Adjutant General of the Headquarters of the Department of Arizona requested the opinion of the Engineering Office regarding the status of the timberland. He replied that the present title to the land in question occupied by the military was very imperfect. Congress had passed a law declaring that no person could make a settlement or location on a tract or parcel of land selected for a military post or within one mile of such a post. In addition, any reservation by treaty, law or proclamation should not be subject to preemption. However, the site occupied by Camp Huachuca had not been reserved by any "treaty, law or proclamation" and the engineer was of the opinion that military authorities could not lawfully prevent settlement in excess of one mile limit. Although approved by the Department commander, Order No. 91 was not of sufficient force to retain the land unless prompt measures were taken to secure it. He continued:

> I would respectfully recommend that in order to include and preserve the timber land, which it seems is the main object of enlarging the claimed area, such lands as may be desired be surveyed and recommended to the proper authorities to be set aside as Mil. Reserve by proclamation of the President as required by law.
>
> This I believe to be the only way by which settlers could be excluded. If settlers are located on the land desired, it is doubtful that they possess legal rights acquired by compliance with the conditions of Homestead, Pre-emption or private entry laws. If upon investigation it is found that they hold no title to their claims they can be ejected, otherwise they could not be disturbed.

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[12] J. P. Martin, A. A. General, 1st Endorsement, January 14, 1878. Records of Adjutant General's Office; RG 94, Box 52, 2300 AGO 1879. 01-0026.

> Prompt action in the matter should be taken in view of the rapid settlement of that part of the country induced by the advancement of Rail-Road in that direction. I would also state that the law confers upon federal officers the power to prevent depredation on timberlands, which right the Commanding Officer at Huachuca could exercise till the acquisition by the military of a perfect title to the lands desired.[13]

[Insert Paragraph]

Territorial Governor A. P. K. Safford had become the champion of settlers or potential settlers. He made inquiries to government officials about federal restrictions upon land entry and requested that Richard C. McCormick, the territorial delegate from Arizona, keep him informed of any proposition for enlargement of the Huachuca military reservation. In Washington, D.C. on March 22nd, the Adjutant General's Office submitted the recommendations of the Department of Arizona and Division of the Pacific approving an enlargement of the reservation to include timber lands "deemed necessary for military purposes." The Adjutant General forwarded the letters to the Interior Department requesting whether Interior had any objections. Meanwhile, while the army waited for Interior's response, on April 24th McCormick's office appraised Governor Safford of the army's recommendation and the pending action.[14] Five days later the Department of Arizona and the Military Division of the Pacific asked the Adjutant General's Office in Washington, D.C. to suspend action on the extension of the military reservation until further notice.[15]

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[13]Fred A. Smith to Assistant Adjutant General, Department of Arizona, March 28, 1879. Records of Adjutant General's Office; RG 94, Box 52, 2300 AGO 1879. 01-0027.

[14]Chief Clerk of Hon. R. C. McCormick to Governor Safford, April 24, 1979. Records of Adjutant General's Office; RG 94, Box 52. 01-0028.

[15]Telegram, Orlando Wilcox to Adjutant General's Office, no date. Records of Adjutant General's Office; RG 94, Box 52, 2614 AGO 1879. 01-0025.

The government had established a sawmill in Huachuca Canyon in the summer of 1878 to supply forts Huachuca, Lowell, Bowie, and Grant, but ~~by spring~~ by spring of 1879 the supply of timber available had nearly become exhausted. The Adjutant General's office instructed Lieutenant A.S. Bailey, of the 6th Cavalry, stationed at Camp Huachuca to inspect the timberlands of the Huachuca Mountains ~~on April 12, 1879~~ with a view of extending the reservation to include all timberland suitable for supplying the needs of the government. Bailey reported that suitable timber could only be obtained ~~by~~ at "Gird's Mill" located 13 miles from the army camp on the east side of the Huachuca Mountains at an elevation of 8100 feet. Bailey to Assistant Adjutant General, April 12, 1879, and Entry 8, Letters Sent, Vol. 2, Records of the Army Continental Command, RG 393. 01-0099. [Winchester to Asst. Adj't. General, May 24, 1879.] [01-0101]

[Continue on new paragraph]

On May 7, 1879 J. A. Williamson, Commissioner of the General Land Office reported back to Secretary of the Interior Carl Schurz on the proposed reservation at Camp Huachuca:

> . . . I have the honor to report that the lands referred to are unsurveyed and there is in this office no record of any claim to them, and there is no objection known to the reservation as proposed. The Mexican or Spanish private land claims in Arizona have not been adjudicated by the U.S. Surveyor General for that territory for the reason that no appropriation has heretofore been made to pay a translator and other expenses of such adjudication. In this connection I desire to refer to a letter from the Secretary of War dated April 22, 1874, relinquishing old Camp Wallen in Arizona to the Interior Department and stating that it was said to be on private land, Camp Wallen never having been declared by the Executive. The proposed new reservation of Camp Huachuca is described in its limits as 'Beginning at the cemetery of Old Camp Wallen' so that it appears to be located upon or in the immediate vicinity of said camp.[16]

On March 20, 1880 the main line of the Southern Pacific Railroad through Dragoon Pass and across the San Pedro Valley at Benson was completed to Tucson. The beginning of railroad freight service across southern Arizona had a powerful economic effect upon what had been a remote and land-bound region. Furthermore, Arizona Territory's richest gold and silver mines were opened at Tombstone in the northern end of the Mule Mountains east of the San Pedro Valley in 1879 and the mineral success of the region was further assured by the opening of rich copper mines centering on the Copper Queen mine at Bisbee. Low railroad freight rates allowed mining in the Sonoran Desert region to shift increasingly to exploitation of copper on a massive scale in place of precious metals. The cattle and sheep industry also increased dramatically after the coming of the rail-

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[16]Fred A. Smith to the Assistant Adjutant General, Headquarters Department of Arizona, March 28, 1879. Records of Adjutant General's Office; RG 94, Box 52, 2300 AGO 1879. 01-0027.

road. Mining camps established a local market for beef. Settlers took up land at good watering holes, stocking their ranches with animals imported by rail from the states or from Northern Mexico. Settlers, prospectors, and miners spread out throughout southeastern Arizona in increasing numbers where they confronted formidable dangers from the Apaches of the region.[17] Efforts to set aside sufficient public lands for the military reservation at Camp Huachuca in advance of the rush of settlement continued.

Procedures were complicated, in part, because public lands in the upper San Pedro Valley had not yet been surveyed by the General Land Office, but also because the maps and papers describing the proposed boundary got lost in transmission to the Washington Office. On July 15, 1880 the Adjutant General Office in Washington, D.C. wrote the Commanding General of the Department of Arizona:

> I have the honor to acknowledge the receipt at this office - without papers or map - of G. O. No. 11, dated June 5, 1880 from your Hdqrs, attaching, subject to approval of the Secretary of War, "Tanner's Canon, A. T. to the military reservation of Camp Huachuca, A. T., the metes and bounds of which to be published hereafter," and by direction of the General of the Army to request that if a Military Reservation is needed at that point, you will cause the same to be duly surveyed & a plat and description thereof to be forwarded to this office together with any report or recommendation you may desire to submit for the consideration of the Secretary of War to the end that the order of the President may be obtained if the proposed request meets with approval.[18]

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[17]Patrick Hamilton, *The Resources of Arizona* (3rd ed.) (San Francisco: A. L. Bancroft and Co., 1884), pp. 147-160; Haskett (1935), p. 7. For Captain Whitside's opinion on the value of Camp Huachuca in enforcing U.S. neutrality laws & protecting U.S. citizens from hostile Indians, see Whitside to Asst. Adjt. Gen. Sept 27, 1880, Entry 2, Letters Sent, vol. 2 no 8.

[18]July 15, 1880. Records of Adjutant General's Office; RG 94, Box 52, 4312 AGO 1880. 01-0030, 15-0002. Tanner's Canyon is known today as Garden Canyon. Records of the Army Continental Commands, RG 393. 01-0102

The maps and description of Fort Huachuca had been forwarded, but were returned with other papers belonging in the case file for Camp John A. Rucker, and therefore, they had been misfiled. Without these materials, the President had been unable to issue an executive order creating the Huachuca military reservation.[19]

By orders of the commander of the Department of Arizona dated October 27 and November 8, 1880, a Board of Officers convened at Willcox Station to discuss the selection of a site for a new military reservation in southeastern Arizona. The board chose a site in the vicinity of Railroad Pass on the recently completed line of the Southern Pacific Railroad. Such a post, they thought, might permit the abandonment of both Camp Bowie and Camp Grant. Their recommendation was sent to army headquarters where General Sherman reviewed it. Sherman thought the proposed site was not of sufficient value to abandon the other two posts. His plan was to neglect one of the old posts and keep the other "until the further developments will demonstrate a single post that will fulfill all the conditions of the military problem of Eastern Arizona." At that point in time Camp Huachuca with its location near the Mexican border appeared the best site, wrote Sherman, but he wanted a thorough reconnaissance of the whole country prior to making a final decision.[20]

The Adjutant General's Office in Washington forwarded Sherman's instructions to the commanding general of the Department of the Pacific in

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[19]Adjutant General to the Commanding Officer of the Department of Arizona. April 20, 1881. Records of Adjutant General's Office; RG 94, Box 52, 7871 AGO 1880. 01-0041.

[20]Adjutant General to the Commanding Officer of the Pacific, January 19, 1881. Records of Adjutant General's Office; RG 94, Box 52, 7871 AGO 1880. 01-0033.

San Francisco on January 19, 1881. One month later, the Commanding Officer of the Department of Arizona instructed Carl F. Palfrey, First Lieutenant of Engineers of the Department, to make a reconnaissance with a view to selection of a new military post in southeastern Arizona. Early in March Palfrey left Whipple Barracks, Prescott, Arizona Territory, to survey the region. On March 31st he reported back to the commander of the Department of Arizona on three potential sites for establishment of a permanent military post: a site near the north spur of Huachuca Mountain, another in Dragoon Pass, and a third at Railroad Pass. If the proposed branches of the Southern Pacific in the San Pedro valley were built, he favored the Huachuca site because it could sustain a large post and was centrally located with respect to the three great valleys of southeastern Arizona.

> The facilities which these three sites offer for the establishment of a post are also in the order in which I have named them. [Huachuca was first.] At each the grazing is excellent. Wood for fuel and for timber is plentiful at Huachuca, scanty in the Dragoon Pass, and almost entirely absent from Railroad Pass. Water is found, of excellent quality, and probably sufficient for six companies, mounted, in the canon where Camp Huachuca is now situated; this could easily be piped to the plateau proposed for the new post. The water of Tanner's Canon, now annexed by Department order to the reservation, and the irrigable land in that canon would furnish a post garden, and an extension of the reservation to include the north spur of the mountain would take in another fine spring valuable for watering the herd and securing a good grazing place, as also for camping ground in case of concentration of troops. This extension is earnestly recommended . . .
>
> In view of the probable value of this position, I have the honor to respectfully recommend that Tanner's Canon be held as part of the Huachuca Reservation, that this reservation be extended to include the north point of the mountain for sake of wood and water so gained and to secure a reasonable amount of land beyond the proposed site for the post, and that, with the latter object, the lines of the reservation be closed upon those of the Babacomari Grant or of the railroad lands. The ground covered by this extension is now unoccupied; this cannot be expected, after

work on the railroad shall have begun.[21]

Lieutenant Palfrey's report recommending the Camp Huachuca site was forwarded to the Adjutant General's Office in the Headquarters of the Army on April 5, 1881.

The recommendation to establish a permanent post at Camp Huachuca precipitated concern about what impact the decision would have on other forts in Arizona. From Fort Lowell came the following reaction from the Commanding Officer of the Department of Arizona:

> I have no doubt of the value of Camp Huachuca, and Lieut. Palfrey's recommendation for enlarging the Reservation & Post is approved. If it be decided to build a new post at the point indicated, Fort Bowie can be broken up & its garrison divided between Huachuca & Grant & Rucker retained as a picket post. But Fort Lowell cannot be divested of its advantages by any such change. Near Tucson, it is practically on the trunk line of the railway from which troops can be more rapidly shipped East or West to many points between New Mexico and the Pacific Ocean, or if necessity arises, troops can be thrown from Tucson into Sonora or to the coast of the Gulf of California much more handily than from any little branch narrow gauge road nearer to the Mexican border. For these reasons I do not approve breaking up Fort Lowell, even for the proposed concentration with Huachuca.[22]

Major General McDowell, commander of the Pacific Military District, from his headquarters at the San Francisco Presidio reminded Sherman that Palfrey's recommendation was not really for a new post but for the enlarge-

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[21]Report of Carl F. Palfrey to Engineering Office, Headquarters Department of Arizona, March 31, 1881. Records of Adjutant General's Office; RG 94, Box 52, 2358 AGO 1881. 01-0031.

[22]Commanding Officer, Department of Arizona to the Adjutant General of Army, April 9, 1881. Records of Adjutant General's Office; RG 94, Box 52, 2868 AGO 1881. 01-0032.

ment of the present post at Camp Huachuca. He concurred in this recommendation, but did not favor abandonment of any other post. He insisted "Time enough for that when the one at Huachuca shall be sufficiently enlarged to cover the troops at the posts which may have to be abandoned." In a postscript, he once again spoke of all the camps and posts that had been created and then abandoned, largely because of sickness. "No permanent post should, therefore, be established until the site shall have been tested by the trial of a temporary camp." Bowie had proven itself as a healthy site and since it was now near a railroad, McDowell did not think it should be abandoned. Similarly, Huachuca had been found healthy and warranted status as a permanent post of enlarged capacity. He endorsed the recommendations of the Engineers Office with respect to Camp Huachuca and requested that Sherman act "without delay."[23]

On April 20, 1881 the General Sherman directed the Department's Commanding Officer to prepare a final survey and map of the military reservation at Camp Huachuca and forward it to Washington, "said survey and map to include Tanner's [Garden] Canon and the extension for the site of the post referred to in the report of the Engineer Officer, together with a description which will enable the President to declare the reservation."[24] In the meantime, Sherman issued instructions that would insure Camp Huachuca's continued operation until the next fiscal year: "It is impossible to obtain an appropriation this year for new posts in Arizona. Therefore Division and Department Commanders are restricted to the money allotted to them by the Quartermaster General for Barracks and Quar-

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[23]Endorsements Commanding Officer of the Department of Arizona, April 9, 1881. Records of Adjutant General's Office; RG 94, Box 52, 2868 AGO 1881. 01-0032.

[24]Adjutant General to the Commanding Officer of the Department of Arizona. April 20, 1881. Records of Adjutant General's Office; RG 94, Box

ters which they can spend at discretion at Bowie and Huachuca neglecting the posts found to be unsuitable or unhealthy."[25]

Insert ¶

~~Four months passed before the Adjutant General's Office issued a special order to carry out General Sherman's directive of April 20th~~. On August 22, 1881, AGO Special Order No. 97 established a Board of Officers consisting of three men to locate the site for a fort: Captain G. C. Smith, of the Quartermaster's Department; Captain T. C. Tupper of the 6th Cavalry; and First Lieutenant Carl F. Palfrey, Corps of Engineers. The three men were instructed to meet at Camp Huachuca on September 1, 1881 "to examine and report on the best site in that neighborhood for a permanent post." Captain Smith, after adjournment of the Board, was ordered to prepare estimates and plans for permanent buildings as instructed by the Chief Quartermaster of the Department.[26]

The board completed its work before the end of September. On the 29th General Sherman briefed Secretary of War Robert Lincoln, who had been appointed to the position earlier in the year, on the history of the post. Sherman also forwarded Palfrey's March 31, 1881 report together with a map of the proposed reservation:

> Camp Huachuca, Arizona Territory, was established in March, 1877. It is situated on the Northwest side of the Huachuca Mountains about eight (8) miles south of Old Camp Wallen and about twenty (20) miles north of the Sonora line.
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> Under the date of December 21, 1877 the Post Commander announced in orders, subject to approval, a military reservation at

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52, 7871 AGO 1880. 01-0041.

[25]Endorsements, Commanding Officer of the Department of Arizona, April 9, 1881. Records of Adjutant General; RG 94, Box 52, 2868 AGO 1881. 01-0032.

[26]Special Order No. 97, August 22, 1881. Printed. Records of Adjutant General's Office; RG 94, Box 52. 01-0044.

Insert ¶ On June 8th the Adjutant General's Office issued instructions to Lieutenant Palfrey to make a rough survey for a Huachuca Military Reservation. Lieutenant A.S. Bailey of the 6th Cavalry carried out the work in the ensuing weeks marking the lines of the proposed reservation with posts, painted and lettered, on all the roads leading into the reservation. Bailey ordered three families squatting in Tanner's Canyon to remove themselves beyond the limits of the reservation within 30 days. Bailey and Captain Tupper, commander of the post, favored establishing the permanent fort in Tanner Canyon because the available water supply (50,000 g.p.d) from springs was at least four time greater than the supply from Huachuca Canyon. Bailey & Tupper also staked out a piece of land on Bobocomari Creek that the troops cultivated for a post garden. Apparently this land was within the claimed limits of the old Spanish land grant, but until the limits of the grant were established by authority of the courts. Tupper advised that it be held as

Fr Tupper to Adj. Adjt. Gen., Dept of Az., June 25, 1881. Entry 2

> the post of 9 miles square - 91 square miles - the post being in the S. W. corner. This was approved by the Department Commander who decided that the Post order would operate until such time as a reservation could be surveyed for a camp and set apart by the proper authority.
>
> In the spring of 1879, Department and Division Commanders recommended that a reservation of the extent described, or larger if necessary, be surveyed and declared, and on the 8th of May, 1879, the Interior Department reported, in response to inquiry from the War Department that the General Land Office knew of no objection thereto. The matter was, however, at the request of the Department Commander.
>
> By General Orders No. 11, Hdqrs. Dept. of Arizona, June 5, 1880 - copy herewith - "Tanner's Canon" was, subject to the Secretary's approval added to the reserve, the metes and bounds to be published thereafter A survey & map of the reservation called for by the Adjutant General July 15, 1880, was made and forwarded, but action was likewise suspended.[27]

Sherman suggested that Lincoln inquire with the General Land Office of the Interior Department about the current status of land within the proposed reservation. As it had in 1879, the Interior Department replied once again that it had no objection to the military reservation, but the commissioner of public lands noted that federal surveyors still had not delineated township and section lines in the area. By October 15th the map and land description were ready and General Sherman forwarded a packet to the Secretary of War enclosing the required information. Lincoln forwarded Sherman's recommendation for the post boundaries as surveyed by First Lieutenant Palfrey and described in his report dated August 24, 1881:

> Beginning at a post branded U.S.M.R. No. 1, set in a mound of stone on conical butte of north-western foot-hills of Huachuca Mountains, N. 23°14'30" W., 287.71 chains, to a post branded

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[27]W. T. Sherman to Secretary of War, 5th Endorsement, September 29, 1881. Records of Adjutant General's Office; RG 94, Box 52, 5115 AGO 1881. 01-0035.

U.S.M.R. No. 2, set in a mound of stone (being the same as post S.I.B. No. 3, of the tract known as the Babocomari grant, as surveyed by S. M. Allis); thence N. 82°35'00" E., along the southern boundary of said tract, 480 chains, to a post branded U.S.M.R. No. 3; thence S. 69°02'30" E. 520 chains, to a post branded U.S.M.R. No. 4; thence S. 8°58'30" W., 251.64 chains, to a post branded U.S.M.R. No. 5; set in a mound of stone on base ridge of eastern foot-hills, of Huachuca Mountains, between the canons known as Tanner's and Ramsay's; thence by most direct lines of water-divide to peak of main divide of Huachuca Mountains, bearing from said post S. 8°58'30" W.; thence along said main divide to the north-westernmost [sic.] peak; thence by most direct lines of water flow, to point of beginning.[28]

Secretary of War Lincoln in a letter to the President dated October 28, 1881 requested that a military reservation called "Camp Huachuca" be set apart with the above described boundaries. He enclosed a map of the proposed reservation.[29] He noted that the General Land Off ice had no objection to setting aside these unsurveyed public lands "to this reservation for military purposes." The following day, President Chester A. Arthur endorsed the Secretary of War's request to establish the Camp Huachuca Military Reservation. The Executive Order read as follows:

Office of the President
October 29, 1881

The within request is approved and the reservation is made and proclaimed accordingly.

The Secretary of the Interior will cause the same to be

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[28]Robert Lincoln to President Arthur, October 28, 1881. Records of the US Army Engineer District, Los Angeles, Phoenix Real Estate Office. 10-0001; General Orders No. 35, November 16, 1881. Records of Adjutant General's Office; RG 94, Box 52. 01-0047.

[29]We looked for this map in textual records of the National Archives and in the cartographic branch but could not locate a copy. However, a base map of the Fort Huachuca Military Reservation showing the survey lines of 1881 and 1883 has been found. See document 01-0019.

noted in the General Land Office.

Chester A. Arthur[30]

The reservation was on unsurveyed public land and the Executive Order provided no estimate of acreage for Camp Huachuca. The reservation contained approximately 42,000 acres and was located approximately 20 miles north of the international border and about eight miles south of old Fort Wallen.

Construction of the Old Post Area.

Captain Whitside, commanding officer at Camp Huachuca from 1877 to 1881, considered the temporary adobe and canvas buildings that housed the first soldiers at the post totally inadequate. In an incredible series of thunderstorms that pelted the Huachuca Mountains during the months of July and August 1877, legend has it that some 30 to 40 inches of water fell at the fort. The commissary store flooded damaging all the perishable supplies stored there. The roof of the Quartermaster storeroom leaked badly and water poured directly into the quarters of Captain Rafferty and Lieutenant Craig. All the mud-mortared fire places in the soldier's squad rooms were washed away. Portions of the troop's stables collapsed, killing three horses. Whitside was forced from his own quarters because he hourly expected them to fall down.[31]

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[30]Endorsement of Chester A. Arthur, October 29, 1881. General Orders No. 35, November 16, 1881. Records of the Adjutant General's Office; RG 94, Box 52. 01-0047.

[31]Letter, Capt. S. M. Whitside to Asst. Adj. Gen., Department of Arizona, Sept. 3, 1877 quoted in Cornelius Smith, *Fort Huachuca: The Story of a Frontier Post*, p. 24.

Whitside remained determined in the face of this setback to improve the post and obtain the Secretary of War's approval for establishment of a permanent installation in the Huachuca Mountains. In April 1879, he began a sawmill operation near the mouth of Huachuca Canyon hoping to obtain lumber to replace the unsatisfactory temporary adobe buildings. The pine trees grew high on the slopes of the Huachucas and the enlisted men were employed to climb up the hillside, fell trees, skin the trunks and then snake the huge logs down the mountain side. Soldier volunteers, who were given extra pay for their labors, did milling and construction work.[32]

Opinions differed widely concerning the administration of Whitside. Soldiers complained to Congress that in addition to drilling, they had guard duty, care of horses, arms and equipment, cooking, baking, police of quarters and stables. Worse, they were obliged to perform labor building quarters, stables, storehouses, bridges, roads, and telegraph lines . . . "involving logging, lumbering, quarrying, adobe and brick-making, lime-burning, masonry, plastering, carpentering, painting, blacksmithing and sometimes woodchopping and hay-making." All of these chores, they insisted, led to the neglect of drilling.[33]

The Inspector General of the Department of Arizona, visiting several years later in 1883, reported unfavorably upon the drilling ability of troops at Fort Huachuca, confirmed that their training had been neglected. Post commanders protested that their men, of necessity, had been engaged in essential tasks of labor and military drills had been of secondary

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[32]Ibid, p. 26.

[33]Anonymous letter sent to the U.S. House of Representatives from 6th Cavalry soldiers at Fort Huachuca in 1878 quoted in Smith, pp. 26-27.

importance. Residents of Arizona Territory, who were appreciative of the protection provided by the soldiers, were more impressed with the progress in the appearance of this remote frontier cantonment even if it was largely a tent city. A reporter for *The Arizona Star* of August 27, 1879, described the post as an attractive and tidy community: "officers quarters are built in neat style of adobe brick, and are very home-like . . . . The hospital tents were clean and cheerful, and the mess room, built of lumber was large enough for eighty soldiers . . . . The tents of the troops were fixed upon a base of boards three feet high . . . . The whole camp was clean, bright, embowered and attractive."[34]

Captain G. C. Smith, of the Quartermaster's Department in Prescott had been charged in September 1881 with preparing estimates and plans for permanent buildings at Camp Huachuca. Colonel J. C. Kelton, assistant adjutant general of the Military Division of the Pacific, completed the first map showing a site plan for Camp Huachuca in October 1881. The plan was for a typical unfortified frontier fort arranged in a formal pattern around a broad, rectangular parade ground. Kelton surrounded the central open space with clusters of functionally related structures: hospital facilities and medical corps housing at the north end; officer's quarters along the eastern flank; commissaries and storehouses on the south at the entrance of the canyon; troop barracks, kitchen, bakery, and administration buildings along the western flank.

At one location or another, Apache warfare had been virtually continuous in the Southwest since Spanish colonial times. In the early 1870s General Crook had seemed on the verge of ending these battles with his campaign of 1872-73 that placed the most troublesome Apaches on dispersed reservations run by the military. Crook was transferred out of Arizona

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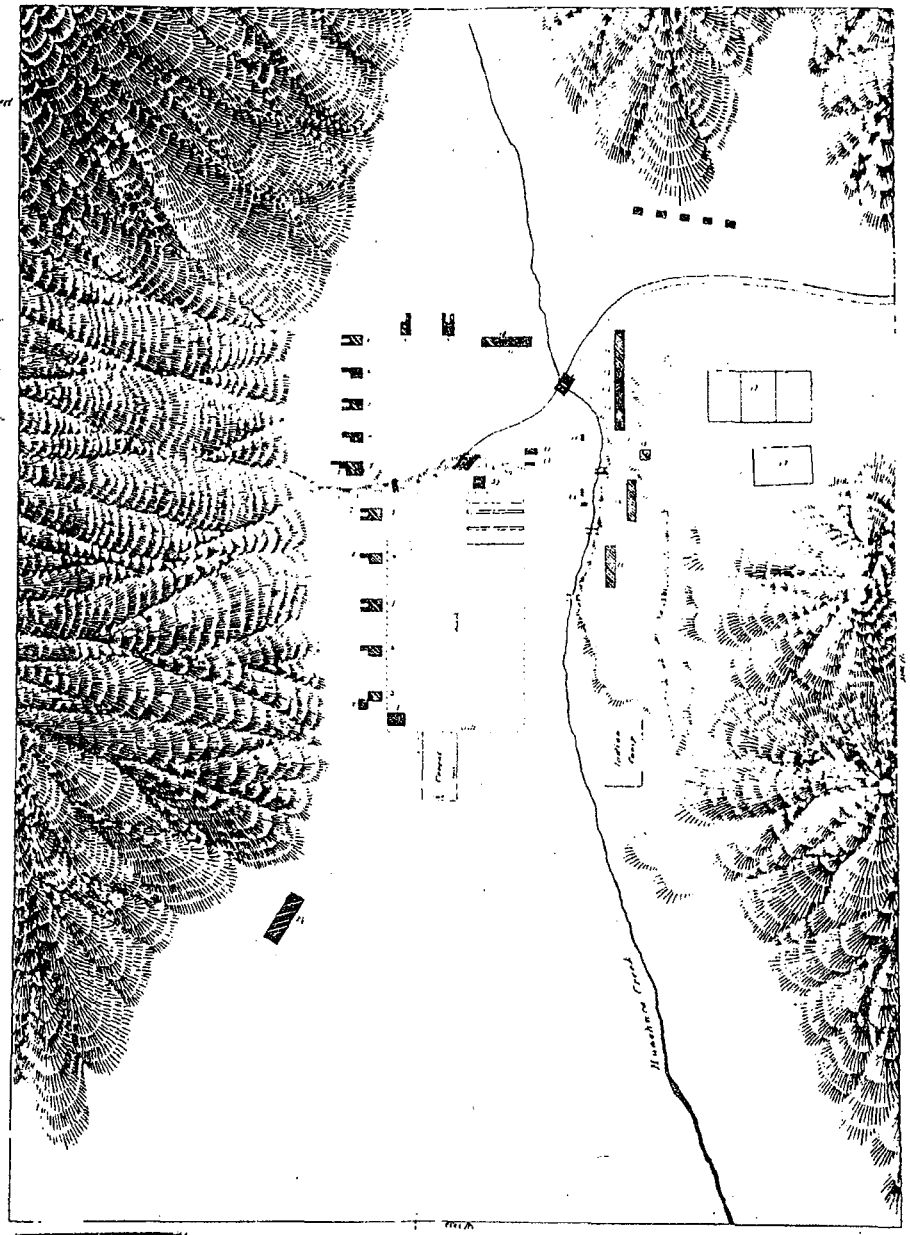
[34]Quoted in Smith, p. 27.

Legend.

- No. 1. Hospital for two Companies, easily converted into a four Company Hospital.
- No. 2. Chapel, to be incorporated with:-
- No. 3. Quarters for Field Officer or Post Surgeon.
- No. 4. Quarters for one Captain.
- No. 5. " " two Lieutenants.
- No. 6. Small Adobe to be used as a Kitchen for a Captains Quarters.
- No. 7. Small Adobe to be used as Kitchen & Servant's room for Quarters for two Lieutenants.
- No. 8. Small Adobe to be used as a Kitchen for:-
- No. 9. Post Commander's Quarters.
- No. 10. Post Trader's, to be converted into:-
- No. 11. Q. M. & Comm'l Store House.
- No. 12. Laundress' Quarters.
- No. 13. Boarding-house, to be incorporated with:-
- No. 14. Cavalry Barracks.
- No. 15. Guard-house.
- No. 16. Barracks.
- No. 17. Cavalry corrals.
- No. 18. O. M. Corral, Hay & Wood.
- No. 19. Store.
- No. 20. Kitchens.
- No. 21. Granary.
- No. 22. Bakery.
- No. 23. Post Adjutant's Office.
- No. 24. Boarding-house.
- Existing Buildings.
- Proposed new Buildings.

Area :- 208.907 Acres.



MAP
—OF—
CAMP HUACHUCA,
—A.T.—

As proposed to be laid out
—by—
Col. J. C. Kelton,
Assistant Adjutant General,
Mil. Div. of the Pac. and Dept. of Cal.

from sketches by,
1st Sergeant Ryan,
C.C.K. 12th Infantry.

October 1881.

ENGINEER OFFICE,
Hdqrs. Mil. Div. of the Pac. and Dept. of Cal.
PRESIDIO OF SAN FRANCISCO, CAL.
November 1881.

W. A. Jones,
Captain of Engineers,
Engineer Officer.

Traced by C. Winstanley, Topographical Assistant.

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Territory in March 1875 and almost before he left the Interior Department set in motion a new policy to bring together all the Apache tribes together on the San Carlos Reservation. The Apaches, who were widely separated tribes that did not constitute a united people, resented being herded together on a single reservation. By 1881 the comparative peace that Major General George Crook had fashioned in Arizona had worn thin. In August 1881, during an attempt to arrest an Apache medicine man accused of preaching a new religion whites considered incendiary, the army killed the Indian prophet and some of his followers. Frightened by the military action and discontent with intertribal rivalries and corrupt agents, Geronimo and several other Apache leaders broke out of the San Carlos Reservation and headed for Mexico with seventy-four followers. At a mass meeting on September 19th in Tucson citizens of the territory passed resolutions demanding the eviction of all Apaches from the area. The following spring, Geronimo returned to the San Carlos and took several hundred Apaches with him back to Mexico. This event prodded the U.S. government to order the "Gray Fox," General Crook to Arizona where he resumed his old policy of exterminating outlaws and encouraging friendly Apaches by liberal grants of land and annuities.[35]

In response to the outbreak of hostilities, General Sherman estimated that the permanent military force in Arizona should be increased by two regiments of infantry and one of cavalry. He planned to station these troops at Forts Apache, Grant, Thomas, and Huachuca (Camp Huachuca had been redesignated Fort Huachuca on February 9, 1882). On May 21, 1882 General McDowell recommended in a letter to the Adjutant General in Wash-

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[35]Bourke, John G. *On the Border with Crook.* (Columbus, Ohio: Long's College Book Co., 1950), and *An Apache Campaign in the Sierra Madre.* (New York: C. Scribner's Sons, 1886). Joseph C. Porter, *Paper Medicine Man: John Gregory Bourke and His American West.* (Norman: University of Oklahoma Press, 1986), pp. 141-164.

ington that the army construct one field-staff and four company quarters, barracks, a guard house, officers store houses, and stables at Fort Huachuca at a cost of $52,000, and to provide for a subsequent enlargement to an eight company post capable of stationing four companies of cavalry and four of infantry at an additional cost of $30,000. The Adjutant General forwarded the request with his endorsement to Secretary of War Lincoln who asked for an urgent appropriation of $205,000 from Congress for use at the forts. President Chester A. Arthur transmitted the request to Congress on June 26th.[36]

Apparently, the special appropriation was not passed before Congress adjourned on August 8th. Two days later General Sherman wrote to the Adjutant General's Office:

> In regard to the posts in Arizona I have heretofore reported as the result of my personal inspection that the posts at Huachuca and Grant be enlarged and improved to the largest possible extent and that all others be neglected. General Crook will soon be there, and I advise that he be supplied with $20,000 each for Grant and Huachuca, the limit of the Secretary's power without a Special Appropriation, and Thomas can get along well enough as now with a small sum for ordinary repairs.
>
> Of Apache I know less but think it is out of place or soon will be, when the Apaches are destroyed, or reduced to absolute subjection.[37]

On August 14, 1882 the Secretary of War approved the recommendation of the Quartermaster General for an expenditure of funds from the Barracks and Quarters allotment of Division of the Pacific. The building program got underway at Fort Huachuca that summer as the post quartermaster hired some

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[36]"Message from the President of the United States transmitting a Communication from the Secretary of War . . . . June 26, 1882. Senate Executive Document No. 187. 47th Congress, 1st session.

[37]Ibid.

47 civilian employees, including nineteen carpenters, nine masons, and 14 general construction laborers.[38]

Between June 1881 and June 1882 Troop I of the 6th Cavalry, Troop K of the 12th Infantry, and a troop of Indian scouts arrived at Fort Huachuca doubling its strength to 187 men.[39] General Sherman visited the post in April 1883 and gave his approval for the construction of permanent facilities. During the spring session that year, Congress approved the special appropriation of $200,000 requested by the War Department for military posts in Arizona the previous year. Fifty thousand dollars ~~$50,000~~ was earmarked for buildings and other improvements at Fort Huachuca. The army spent only a portion of this money and the remainder carried over to the next fiscal year. The Chief Quartermaster's Office reported on July 18, 1883 that the army had more that $75,000 available in 1883-84 for construction and repair work at selected military posts in Arizona. Of this total the Quartermaster Department would spend more than $61,000 at Fort Huachuca, primarily for the construction of 11 officer's quarters. The Quartermaster in charge of the Washington, D.C. office, Quartermaster George H. Weeks, noted that while Fort Huachuca received most of the available construction funds there was much left to accomplish in future years to complete the fort's plans. "The total cost of the building asked for at Huachuca," wrote Weeks, "would, at the present prices of material and labor, cost

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[38]Copy of Endorsement on Plans and Estimates for Fort Huachuca, Arizona Territory, 9th Endorsement by General W. T. Sherman, Headquarters of the Army, August 10, 1882. Records of the Adjutant General's Office. RG 94, Box 52. 01-0048; "Post Returns: Fort Huachuca, June-October 1882." Returns from Military Posts, 1800-1916. Records of the Adjutant General's Office. RG 94. M617, Roll 490.

[39]"Post Returns: Fort Huachuca, June 1881 through June 1882." Returns from Military Posts, 1800-1916. Records of the Adjutant General's Office. RG 94. M617, Roll 490.

$143,544.82. I now recommend expenditure of $61,258.82 -- leaving $82,284.97 to be provided for from future general appropriations for Barracks and Quarters, or by special appropriation by Congress -- the latter of which is urged."[40]

By the latter half of 1883 there was an average of about 250 officers and enlisted men stationed at Fort Huachuca, or about double the average of the previous year. In addition, for several months following September 1883 the quartermaster had more than 100 civilian employees at work building permanent structures to house these troops.[41] In 1883-84 the army finally completed eleven sets of two-story adobe officer's quarters on the east side of the parade ground. The quartermaster also oversaw construction four two-story frame buildings opposite the officer's quarters and fronting the parade ground. The army converted one almost immediately into an administration building, the other three were used for their intended purpose as barracks. Each unit consisted of two squad rooms upstairs and office space downstairs for the company's non-commissioned officers. Other buildings constructed during this initial phase of construction included the quartermaster's storehouse, a guardhouse, hospital, magazine, troop stables, a commissary storehouse, and quartermaster shops.[42]

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[40]J. M. Schofield to Chief Quartermaster's Office, July 18, 1883, with endorsements. Records of the Adjutant General's Office; RG 94, Box 52. 01-0050.

[41]"Post Returns: Fort Huachuca, June 1883 through January 1884." Returns from Military Posts, 1800-1916. Records of the Adjutant General's Office. RG 94. M617, Roll 490.

[42]United States. Department of the Army. Headquarters, Division of the Pacific. Map of Fort Huachuca, A.T. Showing the sewer system as proposed by First Lieutenant James E. Runcie, First Artillery. Surveyed October, 1887.

The steep ridges and plunging gorges of the Sierra Madre of Mexico afforded the Apache shelter and protection and a secure base for raiding on both sides of the international border. In the spring of 1883 the Apaches who had left the reservation 18 months earlier struck like a hurricane all over southern Arizona and New Mexico. In one six day period in March, Apache raiders killed twenty-five persons, one young boy was captured and a number of ranches looted and burned. Chatto and his Apache braves raided a charcoal camp at Camelo, near Fort Huachuca then disappeared across the border. Crook reacted swiftly. Gathering a powerful force he crossed into Mexico and invaded the Sierra Madres where he defeated Chatto's Chiricahua warriors. In a three week campaign of alternate fighting and deft diplomacy General Crook had forced the surrender of the Chiricahua irreconcilables. Chatto, Geronimo, Natchez, Loco and others along with their followers agreed to march to the San Carlos reservation and remain under control of the army. The Indians were slow to come in but by spring 1884 they were on the reservation a few miles southwest of Fort Apache. Peace had come, but once back on the San Carlos Reservation tensions began to build almost immediately. [43]

On the night of May 17, 1885 after a "tiswin drunk," Geronimo, Natchez, Nana and Chihuahua with 32 braves and 100 or more women and children, broke from the reservation. Once again they hid deep in the Sierra Madre. Troops were in the saddle within an hour but failed to overtake them. Crook threw every available man in the field to hunt them down. By May 20 Grierson and his buffalo soldiers were hunting in the Black Range, Mogollons and Chiricahua Mountains. Units of the Third, Fourth and Sixth Cavalry accompanied by Apache scouts swarmed in all directions, yet not a trace

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[43]Bourke, John G. *On the Border with Crook.* ~~(Columbus, Ohio: Long's College Book Co., 1950)~~, and *An Apache Campaign in the Sierra Madre.* ~~(New York: C. Scribner's Sons, 1886).~~

of the Indians could be found.

On June 10 the hostiles revealed their whereabouts when they surprised a detachment of encamped Fourth Cavalry, killed four troopers, and crossed into Mexico. Crook dispatched troops across the Mexican border and to cut off their return to the United States, stationed detachments at every water hole along the border and a second line paralleling the Southern Pacific Railroad. For three months the troops toiled through the Sierra Madre without bringing about a decisive encounter. On September 28 the Chiricahuas fled back across the border and eluded patrols. Pursued and almost cornered, the Apaches encountered the remuda of a ranch engaged in a roundup of cattle and descended on the herd to replace their worn out mounts. Pursuit continued in the Sierra Madre.

By March 25, 1886, General Crook arranged a conference with the Apaches at Canon de los Embudos where the hostiles agreed to surrender and return to the reservation as they had two years earlier. Crook set out from the border with Geronimo, Nachez, Chichua, Nana and 111 men, women and children, but two nights later Geronimo and Nachez stole away and fled to the mountains with twenty warriors and sixteen women and children. The remaining Apaches, seventy-seven in all, were taken to Fort Bowie and entrained for Fort Marion, Florida, as prisoners of war.

Upset about the escape of Geronimo and Natchez and with Crook's extensive use of Indian scouts, General Sheridan issued statements critical of Crook's methods. Smarting under criticism, Crook asked to be relieved and on April 2, 1886 General Sheridan obliged, replaced Crook with General Nelson A. Miles. Not until September 1886 did Geronimo and the last of the hostile Apaches finally surrender. This time no chances would be taken. The terms of surrender provided that the Apaches must be loaded on trains and sent into exile in Florida where they could no longer escape to terror-

ize the settlers of southern Arizona.[44]

Enlargement of the Fort Huachuca Military Reservation, 1883.

The War Department requested the Military Department of Arizona to re-survey the boundaries of Fort Huachuca in February 1883 in order to enlarge the post. Lieutenant G. J. Fiebeger, Corps of Engineers, performed the re-survey and submitted a report dated March 30, 1883 "showing the necessity for extending the northern side of the Reservation to the southern boundary of the Babocomari Grant, as originally intended, for the purpose of securing to the Government the valuable grazing lands in the vicinity of the post."[45]

On May 12, 1883 the Secretary of War recommended to the President that the boundaries of Fort Huachuca be enlarged to embrace the following limits:

> Beginning at a post marked U.S.M.R., No. 1, set in a mound of stone on a conical butte in the northern foot-hills of the Huachu-

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[44]~~Robert M.~~ Utley, ~~*Frontier Regulars: The United States Army and the Indian, 1866-1891*~~ (New York: Macmillan Company, 1973), pp. 369-396. ~~LeRoy R.~~ Hafen, et al., ~~*Western America*~~, 3rd ~~edition~~ (Englewood Cliffs, New Jersey: ~~Prentice-Hall, Inc.~~, 1970), pp. 370-372. OK

[45]Secretary of War to Secretary of Interior, May 12, 1883. Records of U.S. Army Engineer District, Los Angeles; Arizona Real Estate Office. 15-0005. An assessment of the Post Returns for Fort Huachuca indicates that the number of horses on the post increased dramatically in the middle of 1882. From early 1878 through the first part of 1882 the number of government- owned horses on the post averaged about 50. This number was increased to 99 in June 1882 and by January 1883, just before the survey was ordered, the number of government-owned horses had increased to 148. "Post Returns: Fort Huachuca, June 1883 through January 1884." Returns from Military Posts, 1800-1916. Records of the Adjutant General's Office. RG 94. M617, Roll 490.

> ca Mountains, which butte is about six miles distant from the post of Fort Huachuca, on the road to Harshaw, and about 500 yards south of said road, and running thence north, 1° 55' east, 287.71 chains, to a post marked U.S.M.R., No. 2, which post coincides in position with a post marked S.I.R., No. 3, of the southern boundary of the Babacomari grant, as surveyed by S. H. Allis; thence north, 82° 35' east, along the southern boundary of said grant, 524.74 chains, to a post marked U.S.M.R., No. 3, near to and west of the road from Fort Huachuca to Huachuca Station, on the New Mexico and Arizona Railroad; thence south, 21° 41' east, 511.21 chains to a post marked U.S.M.R., No. 4; thence south, 43° east, 171.09 chains, to a post marked U.S.M.R., No. 5, near to and west of the road from Tanner's Canon to Charleston; thence south, 34° 15' west, 251.64 chains, to a post marked U.S.M.R., No. 6, set in a mound of stone on the foot-hills of the Huachuca Mountains, between Tanner's and Ramsey's Canons; thence along the water-shed separating these canons to the main water-shed of the Huachuca Mountains; thence along this water-shed to the point of beginning.[46]

The resurvey added a triangle of land to the north and east of the base of the Huachuca Mountains extending to the south line of the Babacomari Grant, and a smaller block located at the lower end of Garden and Ramsey's canyon. [47]

Two days after receiving the Secretary of War's recommendation, on May 14, 1883, President Chester A. Arthur signed the Executive Order enlarging the military reservation as requested and ordered the Secretary of the Interior to have the reservation noted in the records of the General Land Office. On May 17th, Secretary of War, Robert Lincoln, transmitted the presidential order to the General Land Office "embrac[ing] the limits

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[46]General Orders No. 36, May 24, 1883. Records of Adjutant General's Office; RG 94, Box 52. Document No.? ~~01-0003~~ 015-0007 80-0015

[47]Map of the Military Reservation at Fort Huachuca, Arizona, Survey of 1883. Records of the Quartermaster General's Office; RG 92, Box 426, 323193 QMGO. 01-0019.

described in Departmental letter to the President dated the 12th instant upon which his said order of the 14th instant is endorsed." The Adjutant General's Office at Army Headquarters in Washington, D.C. announced the enlargement publicly on May 24, 1883 as General Order No. 36.[48]

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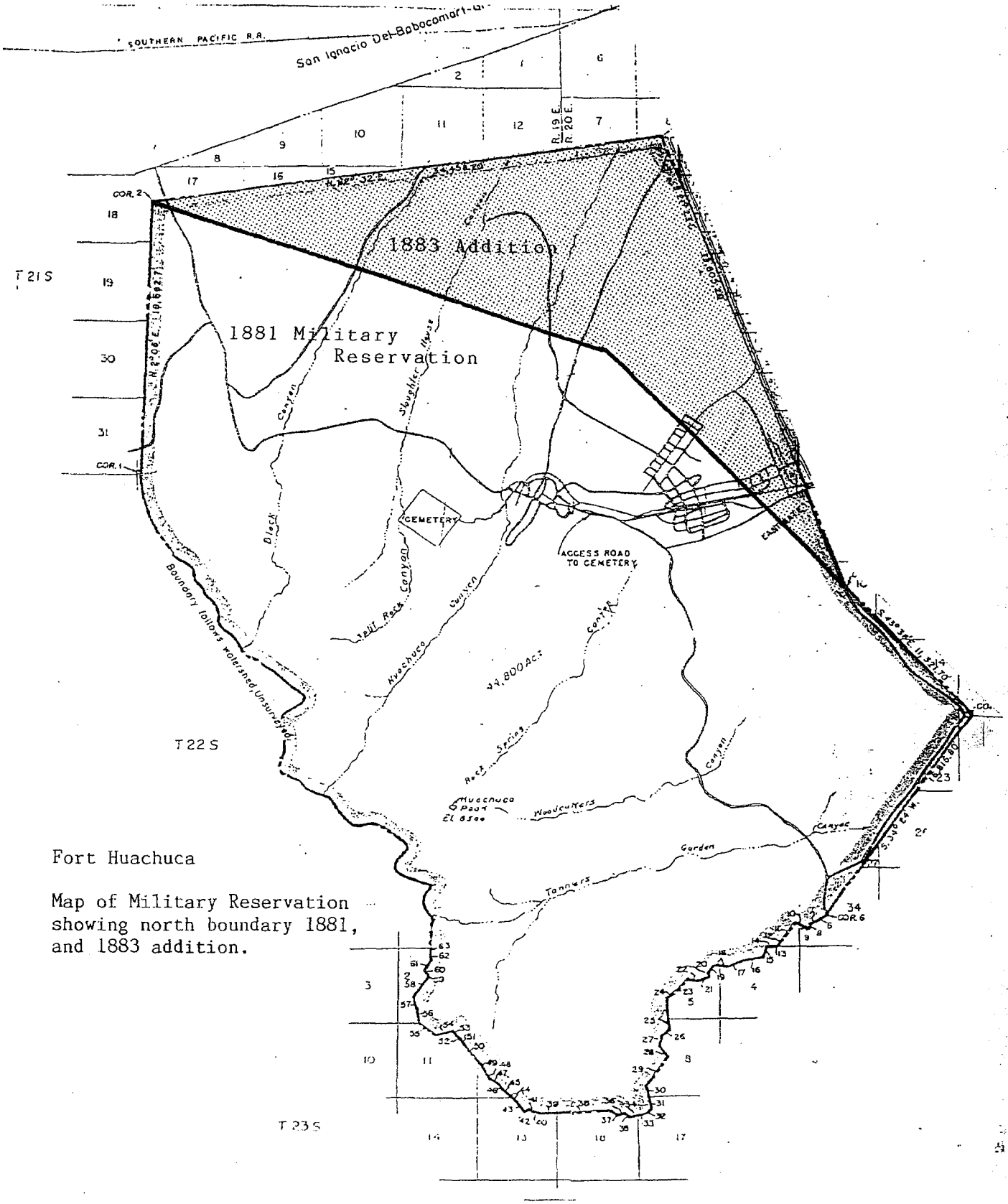
[48]"Presidential Orders." (microfilm collection) University of California, Davis. Shields Library, Government Documents Section.



Fort Huachuca

Map of Military Reservation showing north boundary 1881, and 1883 addition.

FT H-3

SEARCH FOR AN ADEQUATE WATER SYSTEM, 1877-1886

When First Lieutenant Carl F. Palfrey was first sent on a reconnaissance to determine the most suitable location for a military post in southern Arizona in 1881, he recommended the site of Camp Huachuca over other locations, in part, because it contained water sufficient to garrison six mounted companies, irrigable land and water in Garden Canyon, fine springs to water animals, and good grazing grounds.[1] From its establishment as a temporary camp to 1883, Fort Huachuca obtained its water supply by means of a water wagon and a team of six mules, driven by an enlisted man on extra duty. The water wagon consisted of a forty-barrel capacity wooden tank mounted on the running gear of an army wagon. Water continued to be taken from springs at the camp and from ~~This water, taken from~~ the bed of Huachuca Creek a short distance up the canyon, ~~was used at the camp for all purposes~~. However, except for the wet season and during heavy rain storms, Huachuca Creek carried no continuous surface flow; therefore, the army soon had to dig for its water. The post quartermaster sank a well (probably in 1879) on the border of the creek near the sawmill to collect seepage from the stream bed. The well was about 30 feet deep and operated by means of a suction or pitcher pump screwed onto the upper end of a pipe that was inserted to a point a short distance below the water level. The depth of water in the well at any time was not great, perhaps five or six feet, but it never became dry between 1879 and 1882. Further down the creek, at a point adjacent to the troop barracks and the quartermaster's

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[1]Carl F. Palfrey, First Lieutenant of Engineers to Assistant Adjutant General, Department of Arizona, March 31, 1881. Records of Adjutant General, RG 94, Box 52, 2358 AGO 1881. 01-0031.

Initally, the army took its water from the stream & two large springs located within the limits of the camp. Lieutenant Louis Craig explored the possibility of developing a more permanent supply for a larger garrison. As early as April 1878 by constructing sluices to ~~survey~~ water from wells sunk in Huachuca Canyon. His plan was not ~~[illegible]~~ acted upon immediately. (Fn) ~~[illegible] springs located [illegible]~~

(Fn) Lieutenant Louis A. Craig to Chief Quartermaster, Dept. of AZ, April 4, 1878. [illegible] Records of the Army Continental Commands RG 393 01-0097.

corral, the post quartermaster threw up a small check dam in the bed of Huachuca Creek to impound drinking water for horses. The other animals at the post obtained their drinking water directly from Huachuca Creek at places where water was forced to the surface near exposed bedrock.

The well in the canyon near the sawmill provided water to operate a 10-horsepower portable steam engine that furnished power to run the saw, planing machine, and lathe. This same well also supplied water for all domestic uses at the post. The water wagon delivered a daily supply of water for officer's families where an amount sufficient for each day's consumption was stored in barrels attached to each house. This arrangement soon proved unsatisfactory for two reasons: the quality of the water was poor for drinking purposes, and during dry seasons the well's water level dropped so low that it could take ~~several~~ five to six hours to fill the 450 gallon capacity water wagon.[2] At least two trips to the well were required to meet the daily consumption requirements of the post by June of 1881.

Soon after the establishment of a permanent post, the Chief Quartermaster of the Department of Arizona, under directions from General Sherman, asked the post quartermaster to draft plans for installation of a gravity flow system of pipes to convey water from Huachuca Canyon. Captain E. B. Hubbard, Assistant Quartermaster at Fort Huachuca, transmitted his recommendation on April 29, 1882 for a water system utilizing as its source a spring located about half a mile up the canyon. Hubbard argued that this was as far as it was necessary to go for an adequate supply:

> I learn that this spring lives all the year round, even when those further up the canyon dry up, and as this spring furnishes supply ample for all probable needs of the post I consider it unnecessary to incur the additional expense of a two mile extension of the supply pipe to the upper or 'saw mill spring.'

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[2]Captain D. H. Floyd, Post Quartermaster to Chief Quartermaster, Department of Arizona, March 12, 1884. Records of the Quartermaster General RG 92, Box 420, 689 QMO 1883. 01-0008. The best suction pumps of that era would raise water from a depth of about 28 feet. The surface

> It is also suggested that a 4 inch supply pipe would be large enough for all probable wants of the post, and its adoption in place of the 5 inch, would reduce my estimate by $1,498.20.[3]

Hubbard's plan was to lay pipe on the ground. If the pipe was laid to the upper "saw mill" spring, the army would need more than 10,000 additional feet of pipe. He estimated the costs of material at $6,474.22. The proposal called for labor to be performed by the troops and paid from the regular allotment for extra duty pay. As General Sherman had personally chosen the site for the post, Major General Rufus Ingalls, of the Quartermaster General's Office, made sure the request for money to build the water conveyance system moved through the chain of command to the desk of General Sherman before being sent to the Secretary of War, R.T. Lincoln. On June 7th Sherman endorsed the request and urged ~~the Secretary of War~~ Lincoln to allocate $6,500.00 out of the first appropriation, available on July 1, 1882. The request should receive urgent attention, added Sherman: "Water is an absolute necessity in that hot and arid region. I make this recommendation on my personal knowledge acquired on the spot." ~~The Secretary of War~~ Lincoln returned the request to the Quartermaster General asking for an exact estimate of the cost of the water system. Ingalls returned a request for funding in

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water in the well at Camp Huachuca was usually at about 24 to 25 feet. On the practical limits of well-pumping apparatus in the 1870s-1880s see, Isaiah Bowman, "Well Drilling Methods," *USGS Water Supply Paper No. 257* (Washington: Government Printing Office, 1911), p. 88; Tupper to Asst Adj. Gen, Dept of AZ, June 8, 1881, Entry 2, Letters Sent, Vol 2, No 59, Records of the Army Continental Commands, RG 393. 01-0107, Tupper estimated the daily requirements of the post when the Indian Scouts, the full garrison was present at about 3,000 g.p.d.

[3]Captain E. B. Hubbard to the Chief Quartermaster, Department of Arizona, April 29, 1882. Records of Quartermaster General's Office; RG 92, Box 427. 01-0003. Hubbard was a practical engineer. He had attended the United States Military Academy for a year prior to the outbreak of the Civil War. He was stationed at Fort Huachuca from November 1881 to September 1883. He had been ordered to the post in connection with the construction of public buildings and was assigned acting quartermaster on March 26, 1882. "Statement of Military Service of Edward Buckley Hubbard," Headquarters Department of the Army, Adjutant General.

the amount of $4,994.07 on July 22nd. The War Department endorsed the expenditure six days later. The Quartermaster's Office deferred purchase of the pipe until February 1883 pending Hubbard's consultation with the Superintendent of Water Works in Tombstone, who in 1881 had completed a 28 mile eight inch pipeline to the town of Tombstone from springs in Miller Canyon in the Huachuca Mountains.[4] Hubbard's contemplated system, which did not utilize storage reservoirs, was now designed to supply the garrison with 3,000 to 4,000 gallons daily through a six inch supply pipe that tapered down gradually to three inch pipes at the post. By the time Hubbard completed his design alterations, the army had learned that the same pipes and valves called for in the original estimate could be delivered from a St. Louis supplier for $3,774.25. On February 7, 1883 Quartermaster Ingalls recommended the purchase of pipe from St. Louis with the balance of the amount from the July 22nd estimate to be used for "such articles as may have been overlooked in the original estimate." General Sherman and the Secretary of War approved the plan on February 27, 1883.[5]

Hubbard left his mark upon Fort Huachuca in an enduring way because his structures were superbly designed, and many still surround the old

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[4]The mining camp originally obtained its water from shallow wells, but these soon proved inadequate. In 1880 two wells were drilled, twenty feet in diameter, at Watervale three miles distant, to supply the town. When the amount needed for the mushrooming city grew beyond the capacity of shallow wells, a four inch pipeline was laid from Sycamore Spring, seven and a half miles to the north, which produced 15,000 gallons per day. Bryan, 1934, pp. 124-125. J. B. N Gardiner, Assistant Post Surgeon at Fort Huachuca also endorsed the development of a system to pipe water from the canyon because it was necessary to protect the health of the command

[5]E. B. Hubbard to Chief Quartermaster, April 29, 1882. Records of Quartermaster General's Office. RG 92, Box 427, 3829 QMGO 1882. 01-0003; E. B. Hubbard to Major George F. Weeks, Quartermaster USA, August 27, 1882. Records of Quartermaster General's Office. RG 92, Box 427, 3829 QMGO 1882. 01-0002.

see Gardiner to Post Adjutant, Ft. Huachuca, July 12, 1882. Letters Received, Records of the Army Continental Command, RG 393. 01-0100.

parade grounds today. Unfortunately, the capable engineer suffered from alcoholism and after being repeatedly reprimanded by successive commanders of the post he was forced to resign his position in the fall of 1883.[6] In mid-October 1883, after an unusually dry summer, Fort Huachuca experienced its first encounter with a water shortage when the well at the sawmill began to dry up. Using pipe already furnished to the post for the proposed water system, Hubbard's successor, Captain Daniel H. Floyd hastily laid a temporary pipeline above ground up Huachuca Canyon one-half mile to the first spring. By November the pipe was conveying water directly to the troop barracks and the three cavalry corrals located along the west side of the parade ground.[7]

Captain Floyd was a graduate of the U.S. Military Academy (1870) and had served as a cavalry and infantry lieutenant during the Indian Wars. In the spring of 1883 he was assigned to the Quartermaster Corps and sent to Fort Huachuca as the Assistant Quartermaster. When Hubbard resigned, Floyd became post quartermaster in-charge-of construction. He oversaw all construction activities at the post through June 1886.[8] Floyd re-evaluated Hubbard's plans and made two significant changes in the proposed water works: 1) he concluded that the army should build a water system containing some reservoir storage capacity; and, 2) the army should use "Sawmill Springs," located three miles up Huachuca Canyon, as its primary water source. He forwarded his recommendations to the Chief Quartermaster on February 16th, and in a second letter dated March 12, 1884 to

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[6]Smith, pp. 43-44.

[7]Captain D. H. Floyd, Post Quartermaster to Chief Quartermaster, Department of Arizona, March 12, 1884. Records of the Quartermaster General RG 92, Box 420, 689 QMO 1883. 01-0008.

[8]Major General George W. Cullum, *Biographical Register of the Officers and Graduates of the U.S. Military Academy* (Cambridge:

the Chief Quartermaster of the Department of Arizona, explained his reasons for extending the pipeline further up the canyon:

> The water obtained from the well in the margin of the creek and that conducted in pipes to the barracks and corrals is the same. Its source is the same, the creek and boggy marshes which empty into the creek, and is, strictly speaking, unfit for use for domestic purposes. It is loaded with organic matter, vegetable decomposition and earth and imparts a sediment that coats every vessel in which water is used.
>
> About three miles above the post up the canon is a living spring, or springs, from which is turned out considerable water, a volume of perhaps about six inches,[9] if confined. The water from this spring (or springs) runs into the creek which passes through the post, and contributes materially to the making of the stream; but, a short distance of a quarter of a mile, perhaps, the water in the creek disappears -- sinks below the surface of the bed of the creek -- making its appearance again, however, at intervals in places where the bedrock is exposed, and so on through the whole length of the creek.
>
> It is a misnomer to call this creek a stream. Except in very wet seasons, and during continuous rain storms, there is no running water in it, and the water which for the most part can only be reached by digging cannot be depended on as a source of supply for any tangible purpose.[10]

Riverside Press, 1891), 165-166.

[9]This probably refers to the "miner's inch", a measurement of the quantity of water discharged freely into the air through each square inch of opening when the water stands at a prescribed constant height above the opening. In Arizona the legal value of a miner's inch was 1/40th of a cubic foot per second under six inches of pressure. Thus, six miners inches would represent a flow of .15 cfs or 96,947.5 gpd.

[10]Captain D. H. Floyd to Chief Quartermaster, Department of Arizona, March 12, 1884. Records of Quartermaster General's Office; RG 92, Box 426, 689 QMGO 1883. 01-0008.

The Quartermaster's Department had to resolve several engineering details before the system could be completed. When the officers' quarters were under construction in 1883, plumbers laid pipe as the adobe walls were completed. All plumbing fixtures had been installed to connect to the rear of the quarters. When the army began to order pipe fittings and dig trenches for the distribution lines, Captain A. R. Chaffee, the post commander, assumed that the supply pipes would be located in the rear of the row of officers' quarters.[11] However, when the final plans arrived from the Engineer's Office, the pipes had been located in front of the quarters. As the connections to introduce water into the buildings had already been laid, there was no practical alternative but to lay the distribution pipes in the rear. A second problem centered around the engineering design and size of the storage reservoir to be laid in solid rock on a hill 170 feet above the post. One plan, proposed by Captain Floyd, cost $3,704.00 for a double reservoir basin of 184,000 gallons capacity with sloping concrete sides; the other, proposed by Lieutenant Theodore A. Bingham of the Engineer's Office, cost $10,618.00 for a single reservoir of 350,000 gallons capacity with carefully laid vertical rock retaining walls. The latter type provided much greater capacity per unit of surface space, but at a larger cost per gallon of storage.[12]

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[11]Chaffee commanded Fort McDowell, Arizona Territory, near Phoenix, in the early 1880s. He took command of Fort Huachuca in October, 1883 and served in that capacity through June 20, 1884. During the period of the insurrection in 1901-1902, he was appointed military governor of the Philipines and later became a lieutenant General and member of the Chief of Staff, 1902-1904. Fort Huachuca Post Museum Library, Biography Binder C. Doc. No. 10 - 0165 (AOD)

[12]Floyd to Chief Quartermaster, Department of Arizona, February 16, 1884. Records of Quartermaster General's Office; RG 92, Box 426, 50 QMGO 1884. 01-0011; Secretary of War's Endorsement, dated June 21, 1884. Records of Quartermaster General's Office; RG 92, Box 426, 585 QMGO 1884.

Captain Chaffee, the post commander, discussed the merits of the two proposed reservoirs in a letter to the Chief Quartermaster of the Department of Arizona:

> The Reservoir originally proposed was a Basin 40 x 80 feet, 16 feet deep, sloping sides, 1 1/2 feet on one foot with division wall two feet thick and our estimate of cost was on a basis of that form. Lieut. Bingham finds that the division wall proposed would not stand the pressure of the water and he proposes a wall of greater dimensions and very costly of construction, if we understand the subject. To construct a division wall as proposed by him, the stone must be first cut to proper angles and then laid with very great care. As we understand it such work requires considerable skill on the part of the masons and especially a thoroughly competent man to oversee the work. The specifications of Lieut. Bingham call for vertical sides but do not reduce the surface area. Vertical sides double the amount of excavation and the capacity also. With vertical sides, the surface area could be greatly reduced and still afford ample storage capacity. An estimate is submitted based on the specifications of Lieut. Bingham's full surface area. A careful consideration of the subject leaves me to propose the basin reservoir, it being somewhat cheaper. With sloping sides as proposed, the concrete will lay well and four inches thick is sufficient. The lining one foot thick necessary in a reservoir with vertical sides, increases the cost over one of sloping sides, with four inches of concrete cemented over, at the rate of about two thirds of one cent per gallon capacity. A Reservoir 20 x 40 by 15 feet deep, vertical sides, would nearly equal in capacity - the one now estimated for: 44' x 48' by 12 feet deep with sloping sides. The cost of the former would be $550 more than the latter. This difference in cost is our reason for establishing for a basin form of reservoir. To obviate the construction of a division wall (which, as will be seen by reference to the estimates, is very expensive), in case a double reservoir is decided on, we propose to excavate a second basin, in all respects like the one herewith proposed, and five feet away from the line of the first, leaving the natural rock in place to form a division wall which would be five feet on the surface and 41 feet on the bottom. If funds can be obtained for the construction of but one reservoir at a time, it is proposed to cap or plug the

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01-0010.

> pipe at "Three-way Tie" "K", so that when the second basin is constructed it can be connected with the main at no expense and with little labor.[13]

Chaffee endorsed Floyd's plan for a double basin reservoir built in two stages and on February 18th forwarded the specifications for the reservoirs with plans and tracings. The Floyd plan called for laying 10,350 feet of 2.5 inch pipe from the canyon to the reservoir. His reservoir design consisted of matching basins 12 feet deep with the bottom a plane 8' x 12'. The sides of the reservoir sloped upwards from the bottom at a 1.5:1 ratio so that the concrete lining would lie on the sides without the aid of masonry of any kind. This slope would permit cleaning and repair crews to walk down to the bottom. The sides and bottom were covered with four (4) inches of concrete sandwiched between two coats of cement. Two 3' by 3' tunnels were necessary -- each fifteen yards long, and with a fall of three feet. One tunnel would face towards the parade ground for the distributing pipe. The other tunnel through the opposite side of the reservoir for cleaning it, so that the sediment would not flow toward the post. The capacity of each basin was estimated at 92,318 gallons and the cost of each reservoir was set at $1,852.00[14]

Within ten days all of this information was returned to the Assistant Adjutant General of the Department of Arizona in Prescott with the request they be shown to Lieut. Bingham, Engineer Officer of the Department "for any remarks or suggestions he may see fit to offer in connection with the

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[13]Endorsement of Captain A. R. Chaffee, Commanding Officer at Fort Huachuca, February 18, 1884. Records of Quartermaster General's Office; RG 92, Box 426. 01-0011.

[14]D. H. Floyd, Specification for Reservoir at Fort Huachuca, A. T. February 16, 1884. Records of Quartermaster General's Office; RG 92, Box 426, 3122 QMGO 1884. 01-0013.

revision of the new estimates." Discussion over construction details and budgets continued into March and by the 25th of the month the Quartermaster General agreed that it was very desirable that the pipes and fittings be supplied, but that it would not be possible to construct the reservoir this year and the funds therefor and the fire materials should be provided from next year's appropriation.[15]

Before recommending which reservoir to build, the Quartermaster General requested on April 17, 1884 that the Quartermaster of the Division of the Pacific provide more information. He questioned the need for two reservoir basins and expressed his tentative opinion that one reservoir, with nearly vertical walls and a capacity of 250,000 or 300,000 gallons, seemed like the better of the two alternatives. Furthermore, he wondered about the capacity of the spring to supply the entire post and requested additional information on the quantity and quality of the spring water.[16] To meet the projected post requirements he thought a much larger diameter supply line than the 2.5 inch line proposed by Floyd was necessary. The Quartermaster General suggested increasing the size to 4 or 6 inches. Finally, he made several suggestions on the type of pipe that might be used for various components of the system and requested an immediate reply from the division office in order that a contract could be drawn up before the end

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[15]Endorsements to Floyd's letter of February 16, 1884. Records of Quartermaster General's Office; RG 92, Box 426. 466 QMGO 1884. 01-0011.

[16]On June 6th, Floyd forwarded a chemical analysis of the spring water by Assistant Surgeon Paul R. Brown to the Quartermaster General's Office. "The spring pours out from the side of the mountain and is apparently free from vegetable matter," wrote Brown. The water could be delivered to the reservoir without contamination. Floyd to Quartermaster General, U. S. Army, June 6, 1884. Records of Quartermaster General's Office; RG 92, Box 426, 894 QMGO 1884. 01-0012.

of the fiscal year and approved by the Secretary of War.[17]

Floyd submitted a report on June 20, 1884 responding to the Quartermaster General's questions. He repeated that the advantages of having two reservoirs was for convenience in cleaning and repairs, one could supply the post while the other underwent periodic cleaning or necessary repair work. The cost of excavating a single large reservoir would be the same as two smaller ones of equal total capacity. As for the relative storage capacity of the two alternatives, Floyd noted that his two basin reservoirs could contain about 200,000 gallons, which he considered an ample reserve supply for the post. At high flow the spring produced sufficient water to fill a four inch pipe, so Floyd concurred with the recommendation of the Quartermaster's Department and asked to be supplied with 14,300 feet of four inch pipe to run from the spring to the reservoir. He promised to forward a water analysis when it was completed, but averred that the water was "of fine quality." In forwarding Floyd's report, the post commander explained that the estimates on cost he had received called for civilian rather than extra duty labor. He suggested reducing the size of the supply pipe to three inches if necessary, which would still provide a sufficient supply of water and reduce costs. The Division Quartermaster forwarded these materials to Washington, D.C. with his estimate of cost at $11,328.14 for the supply line, labor, and fire equipment, excluding the cost of the reservoirs.

On June 21, 1884 the above estimate was submitted to the Secretary of War by the Quartermaster General. He approved the expenditure and two days later in approved an additional expenditure of $3,704.00 for building two reservoir basins. The Quartermaster General wired Major McGonnigle, chief quartermaster for the Department of Arizona, immediately saying that if he

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[17]Office Brief of Water Supply at Fort Huachuca, no date. Records of Quartermaster General's Office; RG 92, Box 427. 01-0020.

could execute contracts before end of the fiscal year, money was available to "provide for double reservoirs, tunnels, iron pipe and enough labor to do the work at Huachuca."[18] At this juncture, Colonel J. G. Chandler, Deputy Quartermaster General, hired a draftsman to make an examination and report on the original plans for the reservoir that had caused so much debate. He reported that the reservoirs had a sufficient capacity to supply a post twice the size of Fort Huachuca, but he estimated construction costs at about $6,800.00.[19]

On June 29th Major McGonnigle transmitted new estimates to the Quartermaster Department in Washington, D.C. for the water system including the cost of civilian labor:

Purchase of pipes, fixtures, hose, etc. in San Francisco	9,328.14
Cement for reservoir	1,008.00
Cost of material	10,336.14
Cost of contract labor	7,340.00
Total	$17,676.14

The Quartermaster General's Office approved expenditure of the additional sum required on June 30 and the Secretary of War concurred on July 3, 1884.[20]

During the next three months, the post quartermaster completed a substantial sufficient work on the main supply pipe, reservoirs, and the

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[18]Endorsement of Secretary of War, June 21, 1884 and June 23, 1884. Records of Quartermaster General's Office; RG 92, Box 426. 01-0010; Fort Huachuca, A.T., Office Brief as to Water Supply, no date, ca. 1887. Records of Quartermaster General's Office; RG 92, Box 427. 01-0020.

[19]M. O. V. Chiffelle to Colonel J. G. Chandler, Deputy Quartermaster General, June 25, 1884. Records of the Quartermaster General's Office; RG 92; Box 426. 01-0014.

[20]Ibid.

distribution system, to put the system into operation. On October 20, 1884, Captain Floyd, wrote a report for the Quartermaster General's Office on the progress of construction work on the water system. The upper spring in Huachuca Canyon had been supplying the post with water since the 28th of September, almost one month. Water was being distributed to each building at the post and furnished ample water to meet all the needs of the families and the troops, in spite of the fact that only one basin of the reservoir had been completed. In fact, the spring supplied so much water that a continuous stream poured out the waste pipe and down into Soldier Canyon. The second basin (under construction) was scheduled for completion by early November. Once the second basin was completed, Floyd requested that funds be appropriated to construct roofs over the reservoirs. This was necessary for several reasons:

> A wall two feet high and four feet thick is built around each basin as a foundation for roof and to keep out cattle, etc. A roof is already demonstrated to be necessary to insure the cleanliness of the water after it reaches the reservoir, and to prevent the reservoir being used as a washing pond for dogs and other animals and also to prevent substances being thrown into it. A roof, with lattice work ventilation on the sides supporting it will also insure a temperature in the water of several degrees lower than if uncovered.

Initial tests of the system demonstrated that enough pressure existed in the system to throw water from a fire hose and nozzle to a height of 50 feet above the buildings at the post, and this with only four feet of water in the reservoir. During the first month of operation, the spring with its catch basin had yielded plenty of water to the post, wrote Floyd, and if more water was required a second spring thirty or forty yards away could be easily tapped and utilized by minimal digging and masonry work. The quality of the water flowing from the reservoir was also excellent, noted Floyd. The water from the catch basin had its source in bed rock,

and it was conducted through four inch pipe directly into the reservoir basin. Thus, the water supply was free of vegetable matter. "The water in the reservoir," wrote Floyd, "is clear as crystal, and objects on the bottom can be distinctly seen."[21]

On December 1, 1884, the Quartermaster General's Office in Washington approved an expenditure of $4,555.21 for construction of roofs over the hilltop reservoirs, purchase of additional pipe and fittings to complete water connections at the post, and purchase of hose and other necessary fire extinguishing equipment. The Secretary of War endorsed the recommendation and approved the funding on December 10, 1884.[22]

Between 1884, when the army completed its gravity flow water delivery and storage system for Fort Huachuca, and 1886 there were extensive changes at the fort as a result of the organized campaign of the Apache Wars and the effort to capture Geronimo. In 1884 the 4th and 6th Cavalry and 1st Infantry were assigned to Fort Huachuca. In 1886 the 6th Cavalry was no longer stationed at Huachuca, but reinforcements came from the 8th Infantry and some units within the 10th Cavalry. Whereas the number of soldiers stationed at the post in 1883-84 had hovered at about 200, the numbers between 1885 and 1888 averaged in excess of 300 persons. The number of government-owned horses foraging on the military reservation grew comparatively.[23] The increase in the number of men and horses at the

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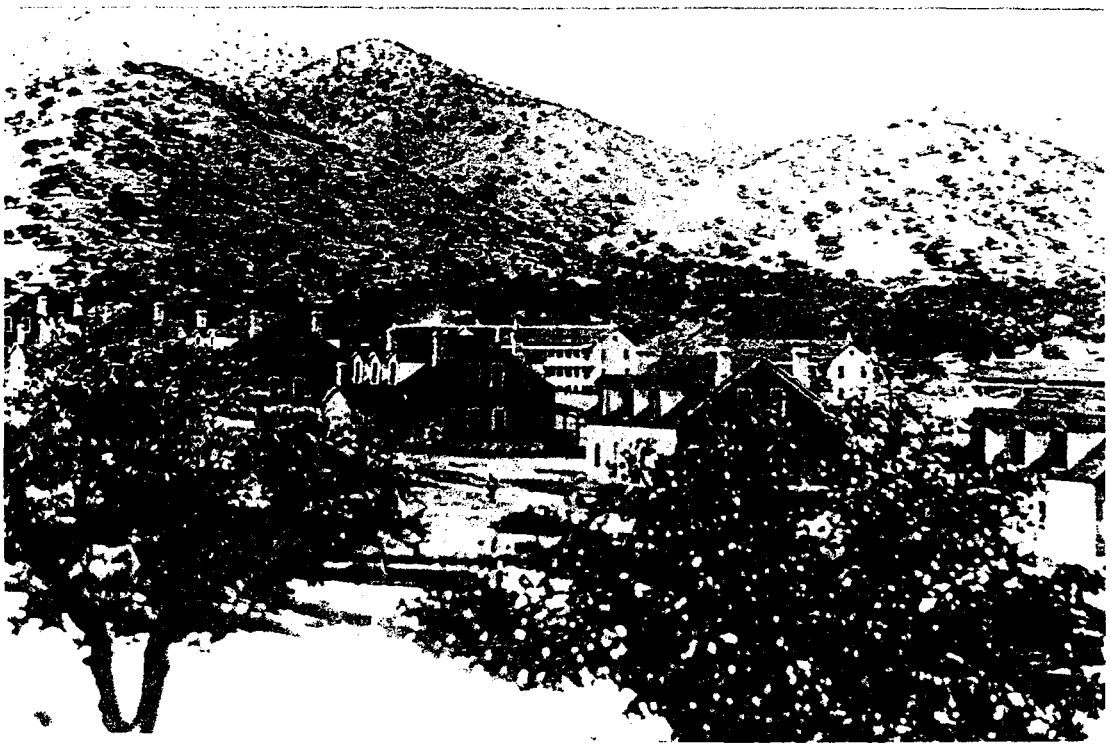
[21]Captain D. H. Floyd, Assistant Quartermaster, to Chief Quartermaster, Department of Arizona, October 20, 1884. Records of Quartermaster General's Office. RG 92, Box 426. 01-0015.

[22]November 3, 1884 endorsement to Floyd's letter of August 20, 1884. Records of Quartermaster General's Office; RG 92, Box 426. 01-0015; Office Brief of Water Supply at Fort Huachuca, Records of Quartermaster General's Office; RG 92, Box 420. 01-0020.

[23]Smith, 1913 p. 392; "Post Returns: Fort Huachuca, 1883-1888." Returns from Military Posts, 1800-1916. Records of the Adjutant General's Office. RG 94. M617, Roll 490.



Fort Huachuca ca. 1886. Officer's Quarters with barracks in background.

Fort Huachuca ca. 1885. View of Officer's Quarters, Service Buildings. Reservoir visible on ridge in background.

fort and the expansion of general ranching activity in the San Pedro Valley was beginning to have an impact on the quality of water available to the post from a system that depended on spring water. Captain Floyd wrote to the Chief Quartermaster at Whipple Barracks as early as May 1866 requesting barbed wire sufficient to build approximately 31,680 feet of fencing to enclose the grazing grounds on the military reservation. The increasing number of cattle on neighboring ranches combined with a scarcity of water during the summer months drove cattle to seek water in the canons of the Huachuca Mountains. As they grazed on and off the mountain, the cattle "tramped out all the grass within a radius of several miles around the post and renders the herding of cavalry horses almost useless," wrote Floyd. The army began fencing off range land in the summer of 1886.[24] Protecting water sources also became a recurring problem. By 1890 Post Quartermaster Lieutenant N. F. McClure requested that the army construct substantial fences around the springs and the dam in Huachuca Canyon. The ground about the springs was marshy so when grass sprung up and feed was scarce, cattle came to those places to eat. The animals waded about in the marsh and stood on it for hours thus polluting the water.[25]

If the quality of the water was quickly becoming a problem, by the fall of 1886, the quantity produced from "Sawmill Spring" was also becoming inadequate. In the summer of 1886 during the last months of the campaign against Geronimo nearly 400 officers and enlisted men were stationed

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[24]D. H. Floyd to Chief Quartermaster, Department of Arizona, May 19, 1886. Records of Quartermaster General's Office; RG 92, Box 427. 01-0004.

[25]N. F. McClure, Post Assistant Quartermaster to Chief Quartermaster, Department of Arizona, April 20, 1890. Records of Quartermaster General's Office; RG 92, Box 426, 568 QMGO 1890. 01-0016.

at the post. The water system was stretched to its limits. In October that year, Quartermaster McClure transmitted a special estimate for more pipe and fittings to expand the water supply system at the post citing "the large increase in the garrison [that] render[ed] it absolutely necessary."[26]

The campaign against Geronimo had ended with his capture in September of 1886. When McClure's request reached the Chief Quartermaster of the Department of Arizona, he returned it asking whether the recent withdrawal of two companies, 8th Infantry, and one troop of cavalry from the post, and the recent circular of the Quartermaster General directing economy, the proposed extension to the Fort Huachuca water system was still necessary. The post quartermaster replied that even with this withdrawal there was still one more cavalry troop there than originally and no pipes or fittings were available to expand the system. The Quartermaster General of the Army recommended the expenditure of the estimated cost of $750 on December 23, 1886 and the last day of the year the Secretary of War approved the recommendation.[27]

With the completion of the last U.S. military campaign against the Apache, the number of troops stationed at Fort Huachuca did not decrease as anticipated. The new American interest in southeastern Arizona was vividly illustrated by activities following the invasion of the last frontier by the Southern Pacific Railroad. The Southern Pacific joined the Atchison, Topeka, and Santa Fe at Deming in 1881 giving Arizona access to two trunk lines leading eastward. Sylvester Mowry's dream of a railroad to Guaymas became a reality a year later when the Sonoran railroad projected

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[26]Patch to Chief Quartermaster, Department of Arizona, October 26, 1886. Records of Quartermaster General's Office; RG 92, Box 427. 01-0005.

[27]Endorsements on Patch letter of October 26, 1886. Records of Quartermaster General's Office; RG 92, Box 427. 01-0005.

a line from the Mexican port city to Benson, Arizona on the line of the Southern Pacific.[28] The coming of these railroads and the new boom in silver and copper mining had a dramatic effect on the nature of the territory. The silver rush to Tombstone, for example, created a new town in the middle of nowhere, and served as the impetus for several satellite villages such as Charleston, Contention City, and Richmond, and brought about the organization of Cochise County in 1881. Mining and gold bullion attracted bands of criminals who drifted into the region. These outlaws robbed and killed miners, rustled cattle from the newly established ranches of southeastern Arizona, and periodically raided towns in Sonora.[29]

The rush to Tombstone also coincided with the rise of less famous mining communities at Globe, Florence, and Bisbee. As chemists and engineers learned to extract Arizona's oldest know mineral - copper - in a more efficient way, large copper firms came into being in Arizona. By the end of the 1880s the need for copper wire for telegraph and electrical wire led eastern capital to invest in the Bisbee mines making its copper mines the state's leading industry. The presence of thousands of miners created an enormous demand for foodstuffs. Ranchers drove cattle into the southern Arizona valleys, and soon local ranching enterprises, which had been established for the purpose of feeding army installations and Indian

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[28]Hubert H. Bancroft, *Arizona and New Mexico, 1530-1888* (San Francisco: The History Co., 1888), pp. 603 ff.

[29]Frank C. Lockwood, *Pioneer Days in Arizona, from the Spanish Occupation to Statehood* (New York, 1932), pp. 191-217; John M. Meyers, The Last Chance: Tombstone's Early Years (New York, 1950) pp. 25 ff.; James H. McClintock, *Arizona, Prehistoric - Aboriginal - Pioneer - Modern.* 3 vols. (Chicago, 1916), II, pp. 410-412; Arthur L. Walker, "Recollections of Early Day Mining in Arizona," *Arizona Historical Review*, 6 (April 1935), pp. 14-43.

reservations, expanded to supply beef for the growing mining towns.

Thus, during the late 1880s when overall military strength in the Department of Arizona was lessened, the need for a continued military presence to protect American interests in the mining and cattle country of southeastern Arizona was on the rise. When the army began to consolidate its western frontier posts, Fort Huachuca's strategic location near the international border and in the center of a developing mining region region assured its continued existence.

THE FORT HUACHUCA WATER SYSTEM DEPENDENCE ON SPRINGS, 1886-1930

The two dominating features of the climate of Fort Huachuca are its abundant summer rainfall and its mild year-round temperature. The average annual precipitation at an altitude of 5,000 feet is about 16.5 inches, but the peaks of the Huachuca Mountains which rise to an elevation of 8,500 feet may get as much as 25 inches. Being located on the eastern slopes of a mountain range, Fort Huachuca is in a good position to get a maximum amount of rain from the moist tropical air masses which move into southern Arizona in the summer from the Gulf of Mexico. The combined influence of strong surface heating and orographic uplift over the Huachuca Mountains causes numerous showers to develop in the region of the fort during the warmer hours of the day. Although brief, these summer showers or thundershowers are intense and of sufficient frequency to account for more than 50% of the annual precipitation. Most of this rain falls in the months of July and August. Winter precipitation is common, but is generally less intense and more widespread than that of summer. Most of this comes during the coldest months of the year and is associated with cyclonic storms moving across the region from the Pacific Ocean. The intensity and frequency of these storms varies greatly from year to year across Arizona. Only one-tenth of the winter precipitation comes in the form of snow which rarely stays on the ground more than a day or two at the elevation of the post.[1]

Until the 1930s Fort Huachuca was dependent on a water supply system fed by spring flow in Garden and Huachuca Canyons in the Huachuca Mountains. There are no streams other than minor creeks flowing from the moun-

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[1]Christine R. Green and William D. Sellers, *Arizona Climate* (Tucson: University of Arizona Press, 1964), pp. 189-92.

tains and these do not flow throughout the year. The mountain springs are recharged from runoff resulting from precipitation and snowmelt that is intercepted by fractured and jointed carbonate rocks. These rocks transmit water rapidly to springs. Most of the springs originating in the Huachuca Mountains produced sufficient water only for local domestic or stock watering uses during a portion of the year. However, in two canyons large springs were present: in Garden Canyon, spring flow is derived from solution channels and fractures in carbonate rocks; and in Huachuca Canyon, from fractures in mudstone, sandstone, carbonate rocks, and granite. These springs yielded a sufficient quantity of water to supply the army post with its required water needs for more than 50 years, but during this entire period dependence on spring runoff made Fort Huachuca vulnerable to the caprices of climate in the arid Southwest.

In 1886 the 8th Infantry had been stationed at Fort Huachuca joining the 1st Infantry and the 4th Cavalry at the height of the Apache campaign when some 400 officers and enlisted men were stationed at the post. The following year only the 4th Cavalry remained, but with its attached units the post population averaged about 320 military personnel. In 1888 the 4th Cavalry was again joined by the 9th Infantry. Not until the Philippines Insurrection at the turn of the century (which only temporarily drained the post of its military personnel) did the number of troops stationed at Fort Huachuca drop below 300 persons for any extended period.[2]

At the close of the nineteenth century, the small frontier posts built to control rebellious Indians in southern Arizona Territory were abandoned and the army concentrated its troops in larger units where they drilled as regiments and practiced field maneuvers. In September 1889, the Military Department of Arizona was reduced to 57 troops and companies of the line and three companies of Indian scouts. Simultaneously, Colonel Benjamin H. Grierson suggested the abandonment of six Arizona army posts. In 1890 the army left Forts McDowell, Mojave, Verde, Apache, and Lowell in Arizona

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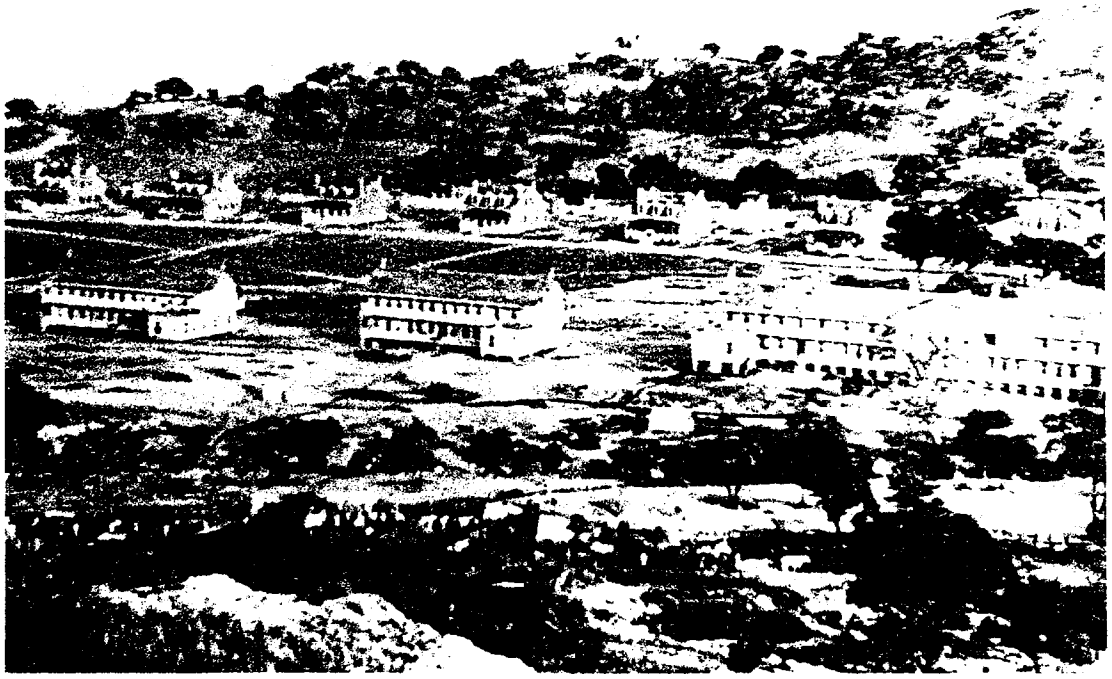
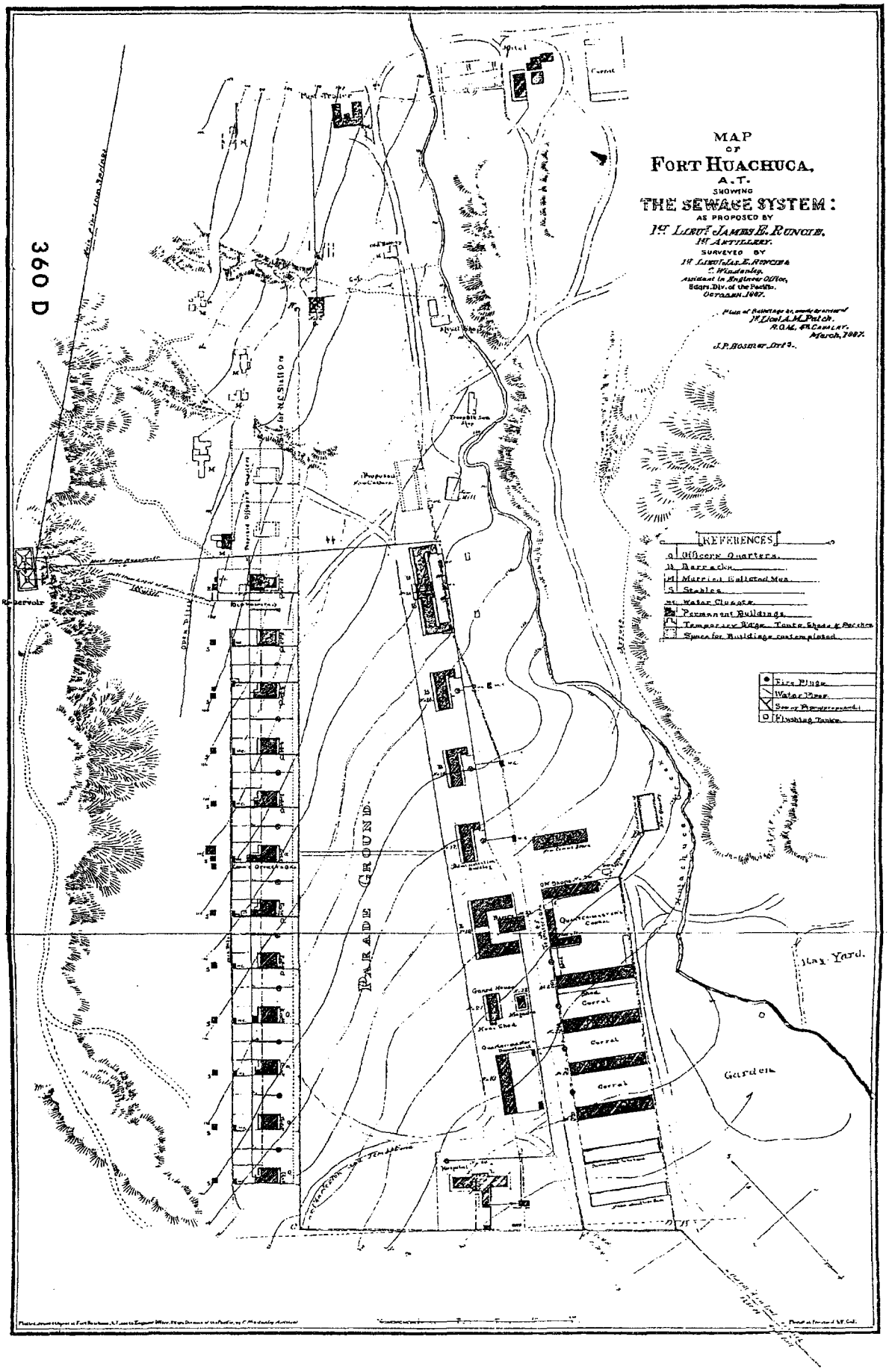
[2]"Post Returns: Fort Huachuca." Returns from U.S. Military Posts, 1800-1916. Records of the Adjutant General's Office. M617 Reels 491-492.



Fort Huachuca ca. 1886. Barracks in foreground, Officer's Quarters in background. Huachuca Creek flows right to left in foreground.

Roof covering Old Post Reservoir, ca. 1900.



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Territory. With the abandonment of Fort Bowie in 1894 and Fort Grant in 1905, Fort Huachuca remained as the sole permanent military post in southern Arizona. The primary function of the post was to patrol the Mexican border.[3]

With the end of the Apache campaign, troops that had previously been widely dispersed to meet the exigencies of controlling the Indians settled into routine camp life at the fort. From its inception in 1877 to 1911 Fort Huachuca obtained its water supply exclusively from springs in Huachuca Canyon. The entire conveyance and distribution system was accomplished by gravity.[4] Although the water delivery system was primitive by modern standards, Fort Huachuca enjoyed a generally good, potable source compared to many other posts on the western frontier. As was common practice in early domestic systems, no effort was made to treat the water before it was released from the reservoir into the post distribution system. The only purification process came from some turbidity control (sedimentation) in the storage reservoirs which served as settling basins.[5]

Water was in ample supply at the fort during the rainy season, but as long the army depended exclusively on springs for its water supply, it experienced periodic shortages.[6] During the era of the Apache campaign sometimes in the driest periods of the year, the post commander ordered part of the cavalry regiment to temporary camps in Garden Canyon

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[3]Annual Reports of the Secretary of War, 10-0024 to 10-0026; Walker and Bufkin, 1979, p. 37.

[4]Military Construction Line Item Data: Development of Spring Water Supply in Huachuca and Garden Canyons," September 15, 1966. p. 4. Hayden 306:20. Arizona Collection, ASU. 20-0014.

[5]"Report of the Surgeon-General," Annual Report of the Secretary of War, 1892-93 (1893), p. 520; 1893-94 (1895), p. 513.

[6]Annual Report of the Secretary of War, 1897 (1897), p. 174.

because of water shortages at the post itself. The year 1886 was dry;[7] Fort Huachuca received only 11.47 inches of precipitation. During the first half of 1887 the drought continued with total rainfall for the sixth month period measuring approximately two inches. Non-domestic water consumption had to be curtailed. In March of that year, the post commander ordered Troop B, 4th Cavalry to cease irrigating its troop garden because of the short water supply.[8] Later that summer, the post surgeon, Leonard Wood, reported that vegetables were scarce at the post hospital because the troop gardens had not produced a sufficient crop. The army tried to conserve additional water in Huachuca Creek by sinking a check dam across the channel a short distance above "Sawmill Spring" to interrupt underground flows, and thereby forcing water to the surface. Directly below the dam, the army built a 16 foot diameter rock-lined reservoir tank that was sunk directly into the bed of the creek. This tank collected water from the check dam and from a spring located 50 feet to the west. Water from the storage tank was piped about 160 feet along the west bank of Huachuca Creek to a point below "Sawmill Springs" where it connected with the pipeline to the hilltop reservoirs.

This attempt to enhance the water supply failed largely because the structures were poorly engineered. First, the check dam was not carried down to bedrock, therefore water flowed under it. Second, the in-channel reservoir was not carried to a sufficient height to exclude floodwaters. In July 1887 summer storms dropped 4.08 inches of rain at the fort. The resulting high water flows in the creek spilled unfiltered surface water over the top of the reservoir box contaminating the post's water supply.[9]

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[7]The first recorded rainfall observations in San Pedro Valley go back to Fort Huachuca's measurements in 1886.

[8]Fort Huachuca History Binders, Fort Huachuca Post Museum. 10-0011.

[9]Leonard Wood, post surgeon, to Commanding Officer, July 31, 1887. Fort Huachuca History Binders, Fort Huachuca Post Museum. 10-0012.

Total Annual Precipitation[10]
Fort Huachuca, 1886-1918

Year	*Amount (in inches)*	*Comments*
1886	11.47	
1887	15.28	interpolated
1888	19.95	
1889	15.39	
1890	19.60	
1891	10.84	
1892	11.50	
1893	20.16	
1894	13.95	
1895	14.15	
1896	14.97	
1897	16.68	
1898	21.82	
1899	18.83	
1900	12.01	excludes January, no data
1901	18.64	
1902	13.67	
1903	12.68	
1904	18.03	
1905	30.20	excludes March, no data
1906	16.13	
1907	24.44	
1908	15.60	
1909	11.60	
1910	9.54	
1911	12.17	
1912	19.80	
1913	16.93	
1914	25.57	
1915	15.22	
1916	11.01	excludes January, no data
1917	18.63	
1918	8.62	excludes September, November, December, no data

Mean Annual Precipitation 1886-1918 = 16.21

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[10]A. W. Greeley, Chief Signal Officer, USA, "Irrigation and Water Storage in the Arid Regions," H EX DOC 287, 51:2 (1891), p. 33; U.S.D.A., Weather Bureau. *Report of the Chief of the Weather Bureau, 1893-94* (Washington, D.C.: GPO, 1895), p. 194; 1894 (1894), p. 186; 1895-96 (1896), p. 178; 1896-97 (1897), p. 238; 1897-98 (1899), p. 206; 1898-99 (1900), p. 370; 1899-1900 (1891), p. 204; 1891-92 (1903), p. 370, 402; Christine R. Green and William D. Sellers, *Arizona Climate* (1964), p. 191. With the exception of a few scattered months, the weather station at Fort Huachuca was closed from 1919 to 1954.

In 1888 Congress at the request of the Secretary of War appropriated $5,049 for water, drainage, and sewerage improvements at Fort Huachuca. The following year, the army spent $2,850 to construct and repair sewage facilities and dug test wells on the military reservation in an effort to discover new sources to increase the water supply and improve its quality.[11]

During the winter of 1889-90 little snow or rain fell in the Huachuca Mountains and by February the springs did not produce sufficient water to meet the needs of the post. On April 20, 1890, Post Quartermaster N. F. McClure forwarded a plan with cost estimates to the Chief Quartermaster of the Department of Arizona for improving the quality and increasing the quantity of water at Fort Huachuca. He noted: "This is a matter of great importance as the present supply is not sufficient for the uses of the post and under existing circumstances is liable to become contaminated thereby endangering the health of the post." The army had now developed three sources of supply in Huachuca Canyon: the two springs supplied about two-thirds of the water delivered to the post reservoir; the remaining one-third came from raising water to the surface of Huachuca Creek behind the check dam. Water from the springs was thought to be relatively constant, but that from the creek varied enormously. Since 1887 the water supply pipe had been filled to capacity most of the time without utilizing the upper spring, but owing to the slight snowfall and rainfall in the Huachuca Mountains in 1889, water from all three sources proved insufficient. After studying the problem, McClure concluded that the water supply from the creek was insufficient only because a great deal of it escaped. The catch basin was only three feet deep and beneath it was a layer of sand and gravel several feet thick

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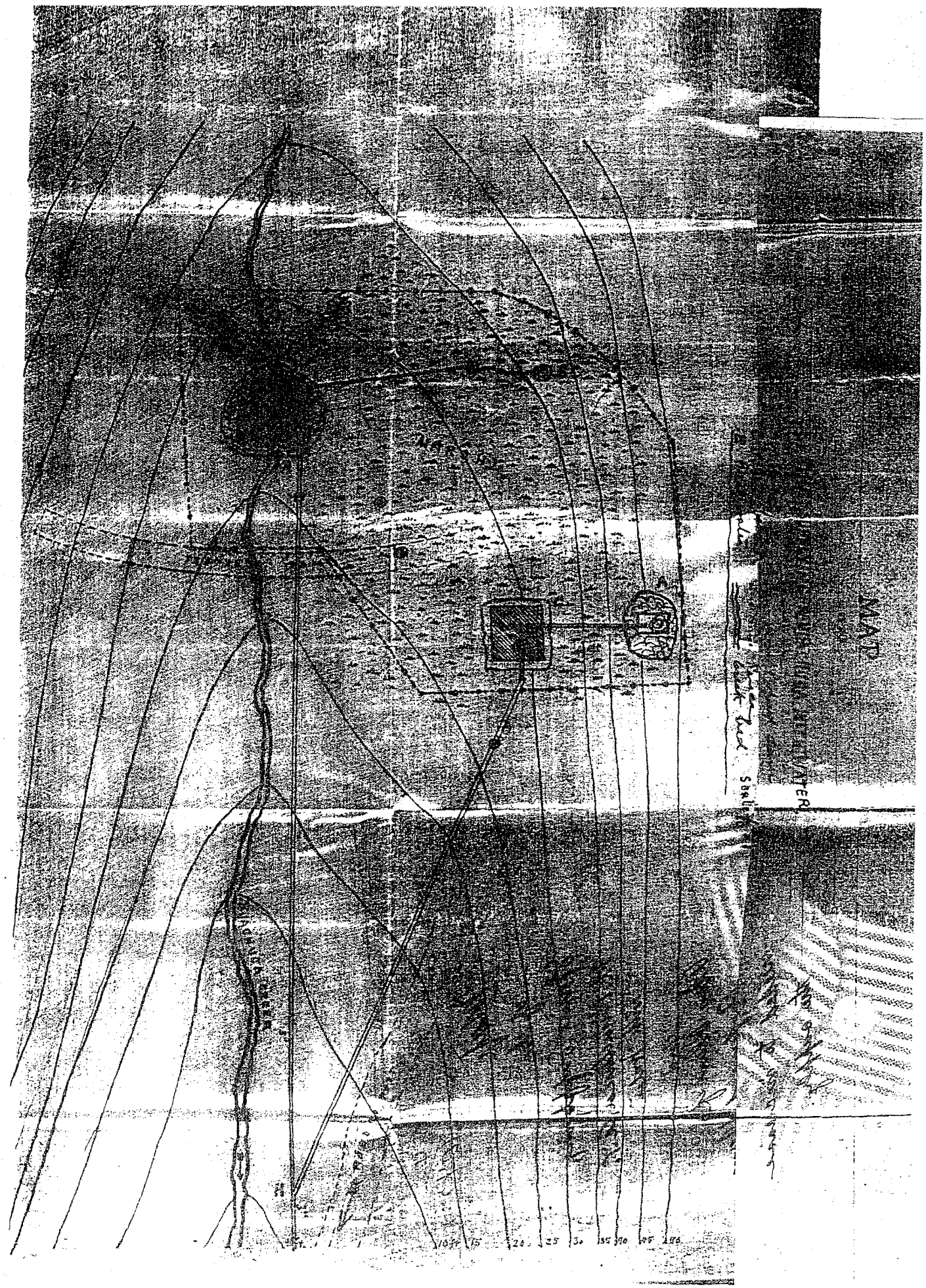
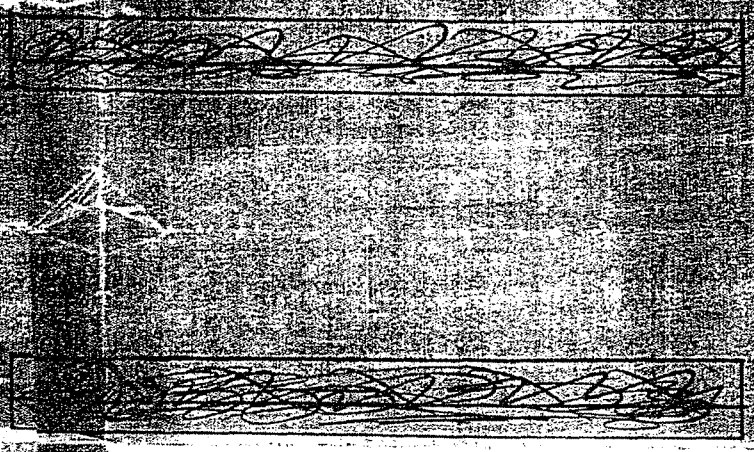
[11] Annual Reports of the Secretary of War, 1888, p. 432, and 1889, p. 430.

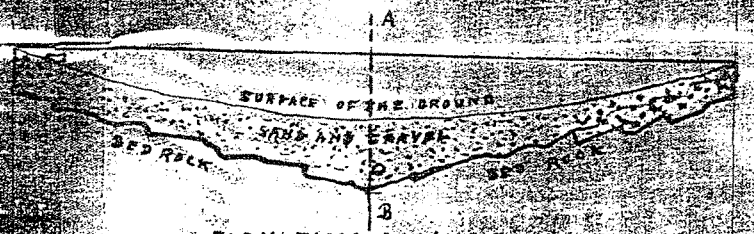
10-0013

10-0017

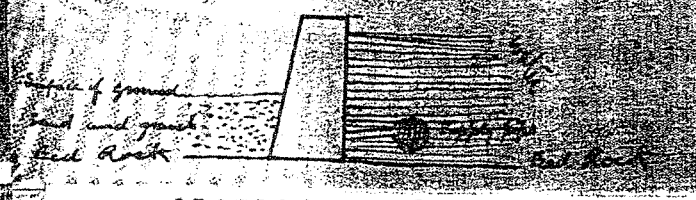

MAP



HORIZONTAL PROJECTION



ELEVATION LOOKING UP STREAM



SECTION AT AB.

SCALE $\frac{1}{10}'' = 1'$

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which separated it from the bedrock. "Unless the quantity of water flowing in the creek bed is sufficient to more than equal the seepage through the layer of sand and gravel, no water will flow from the creek into the basin," observed McClure. He noted that a strong stream of from 2 to 4 inches[12] of water flowed beneath the basin. If saved, McClure thought this amount of water could provide a constant supply of water sufficient to meet current deficiencies. His solution was to build a new check dam about 40 feet below the existing dam. McClure designed gravity-type concrete dam for the site, 50 foot wide and 10 foot high, extending down five feet below the sand and gravel to bedrock. The dam, wrote McClure, would be capable of impounding all the underground and surface flow coming down the creek bed.[13]

On May 26, 1890 the Quartermaster's Department approved an expenditure of $192.35 from the 1890-91 Army Transportation funds for construction of the new impounding dam. In September, the post quartermaster submitted a sketch map of the springs, check dam, and reservoir supplying water to Fort Huachuca along with a plan for an enlarged bedrock check dam needed to increase the supply. The post quartermaster solicited bids from private contractors to carry out the work in the fall of 1890. The lowest bid received exceeded the amount appropriated by the Quartermaster General's Office by $51.28. The office made up the shortfall and authorization to go forward with the project was granted on October 20, 1890.[14]

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[12]The measurement is probably the miner's inch. Two to four miners inches is equal to .05 to .10 cfs, or 32,000 to 64,000 gallons per day.

[13]Map of the Spring Supplying Fort Huachuca, A.T. with Water, and Also Plan of Proposed Dam Needed to Increase the Supply, April 1890. Records of the Quartermaster General's Office. RG 92 Box 426. 135 QMGO 1890. 01-0018.

[14]Second Lieutenant Albright, Assistant Quartermaster to Chief Quartermaster, Department of Arizona, September 24, 1890. Includes endorsements. Records of Quartermaster General's Office; RG 92, Box 426, 568 QMGO 1890. 01-0017. The final authorization by the Quartermaster General is contained on the jacket enclosing the following map. Map of the Spring Supplying Fort Huachuca, A.T. with Water, and Also Plan of Proposed Dam Needed to Increase the Supply, April 1890. Records of the Quartermaster General's Office. RG 92 Box 426. 135 QMGO 1890. 01-0018.

The years from 1888 to 1890 were wetter than normal with average annual rainfall during the three year period exceeding 18 inches. This factor may have caused Lieutenant McClure to overestimate the amount of water reliably available from the Huachuca Canyon springs. The wet cycle at the end of the 1880s was followed by a period of severe drought. In 1891 only 10.84 inches of rain fell at Fort Huachuca with over 40% of this total falling in the single month of July. The following year brought no relief. Rainfall totals at Fort Huachuca in 1892 measured only 11.50 inches and the drought continued into the summer of 1893. Because the fort depended upon springs that were fed by percolating rainfall, water shortages became increasingly acute.[15]

In the summer of 1891 the army completed more studies on developing the potential of underground water supplies in Huachuca Canyon. These studies suggested the supply might be enhanced by construction of underground diversion works aimed at channelizing and consolidating spring flows. In September 1891, Major Timothy E. Wilcox, the post surgeon, issued a warning that something had to be done or else the existing water system would fail to meet the basic daily needs of the post.

> . . . we find ourselves at the close of the rainy season with fewer promises of its [the water supply] holding out than ever before in the history of the post. Streams which always heretofore have had running water at this season are absolutely dry, and as an increase can not now be expected until next July the outlook is anything but encouraging. An emergency appropriation should be made at once to determine if this supply can be increased by the method proposed in previous reports or some other

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[15]In 1886 Captain Floyd had estimated that the springs in Huachuca Canyon could be made to yield about 97,000 gpd, if properly confined and developed. By 1892 the average daily use at the post was about 85,000 gpd. For Floyd's estimate see, Captain D. H. Floyd to Chief Quartermaster, Department of Arizona, March 12, 1884. Records of the Quartermaster General's Office; RG 92, Box 426, 689 QMGO 1883. 01-0008. For 1892 estimate, see Fort Huachuca: Arizona Territory, June 1892. Records of the Adjutant General's Office; RG 94, Box 52. 01-0042.

> practicable way, lest the abandonment of the post on account of deficient water supply may become a necessity.[16]

In 1891 and 1892 Congress authorized appropriations of $1,058 and $1,290, respectively, to improve the post's water supply, sewage, and plumbing systems. Abandonment did not seem likely. In his annual report for 1891-92 the Secretary of War reported that the key strategic position of Fort Huachuca warranted increased federal expenditures to improve and enlarge the post.

> FORT HUACHUCA, ARIZ. The post is located in a canyon of the same name about 14 miles north of the Mexican line, a convenient point for observing and scouting the frontier. It is 9 miles from a station on the Sonora and Guaymas Railroad. There are comfortable quarters here for four troops of cavalry. It is now garrisoned by two troops of the Second Cavalry, and two companies of the Ninth Infantry. This is an important post, should be kept in good repair, and as soon as practicable should have additional quarters built, with an increase of troops.[17]

In the summer of 1892 two troops of cavalry and five companies of infantry, totalling 430 men, garrisoned Fort Huachuca. They consumed an average of 85,000 gallons of water per day.[18] As recommended in the water supply report completed the previous year, the army in June 1892 completed installation of agricultural drain tiles underground near the original spring in Huachuca Canyon. This work resulted in an immediate increase of flow into the post reservoir of approximately 7,000 gpd -- an amount which was expected to increase as water sought its new passageway. The army also tapped another spring at an unspecified location. It was thought that this source, when developed by construction of a new pipe

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[16]Annual Report of the Secretary of War, 1892, p. 525. 10-0026.

[17]Annual Report of the Secretary of War for 1891-92, p. 256 _-__. 70 · 0014

[18]Fort Huachuca: Arizona Territory, June 1892. Records of the Adjutant General's Office; RG 94, Box 52. 01-0042.

line and storage reservoir, could meet the anticipated water demands of new construction projects including a sawmill, an ice machine, additional cavalry stables, and water closets for the enlisted men's barracks.[19]

However, these improvements to the Huachuca Canyon water system did not immediately solve the seasonal water crisis. The fort experienced a third consecutive dry year lasting into July 1893. In June the *Tombstone Epitaph* reported that water for domestic purposes was so scarce that the commanding officer once again had ordered irrigation of troop gardens to cease.[20] As it had the previous year, the army again tapped a new spring in the canyon to supplement its dwindling water supply. Although these efforts did not significantly augment flows into the post reservoir,[21] local newspaper reports indicated that army officials were confident that they could now hold out if rains came as expected in July and August. The prolonged drought did break with nine inches of precipitation falling at Fort Huachuca in August alone.[22]

In his 1893 annual report to the Adjutant General's Office in Washington, D.C., Post Surgeon Timothy Wilcox described the water supply system. It now consisted of several springs located 2.5 to 3 miles above the post

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[19]228-01 Background Material Files, Fort Huachuca Records, Fort Huachuca Post Museum, p. 253. 10-0003; Annual Report of the Secretary of War, 1892-93 (1893), p. 420, 521 and 525. 10-0026.

[20]*Tombstone Epitaph* June 9 and 13, 1893; *The Oasis* (Nogales), June 15, 1893. 10-0029. Individual soldiers raised corn, barley, wheat and other cereals, and all types of vegetables at gardens located on the outskirts of the post. The post garden was located in Tanner's Canyon where vegetables were raised for the post.

[21]It is likely that the army's development of additional springs adjacent to Huachuca Creek and higher up the canyon had some negative impact on developed springs below because springs flowing in direct response to precipitation are often effected by small fluctuations in groundwater levels.

[22]US Department of Agriculture, Weather Bureau, Report of the Chief of the Weather Bureau, 1893-(1894), p. 194. ____

at an altitude 400 to 600 feet above the hilltop reservoirs. Water was conducted in iron pipes from these springs, or catch basins near them, to the reservoirs, and was distributed to the post through iron pipes. The two adjoining reservoir basins on the hilltop had a total storage capacity of 250,000 gallons. They were excavated from solid rock and were cement-lined. To reduce evaporation, both were covered by a substantial building with a shingled roof. Lattice-work and screens protected the sides to keep out animals. When the reservoirs filled to capacity, the overflow was used either to irrigate the parade ground or "it flowed at will" into a canyon that led it away from the post. Wilcox noted that only small quantities of water ever flowed in Huachuca Creek below the base of the mountains. The stream carried surface water only to a point about three-quarters of a mile below the post before evaporating or disappearing into the desert basin.[23]

During the mid-1890s Fort Huachuca had a capacity to permanently accomodate about 20 officers and 325 enlisted men. With the abandonment of other posts, overcrowding was a recurrent problem. Larger garrisons were sent to Forth Huachuca than could comfortably be accommodated. Nevertheless, housing at the post remained relatively constant throughout the decade with the exception of the addition of bachelor officer's quarters at the north end of the parade ground and four non-commissioned staff residences at the south end of the post.[24] Various units came and went at the fort during the 1890s, but overall the total number of troops occupying the post never exceeded the peak of 462 men reached in 1892 when the 24th Infantry was gradually assigned to Fort Huachuca. The following year the 11th Infantry shipped out and the 24th Infantry Regiment, composed of black soldiers, was stationed at the fort. For the next two years, 1894-95, this infantry regiment and the 2nd Cavalry were assigned to Fort Huachuca. The 1st and 7th Cavalry joined the 24th Infantry in 1896

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[23]Fort Huachuca Records, Fort Huachuca Post Museum, p. ~~254~~ 262-263; Post Museum Narrative History, "Permanent Old Post, 1880-1902" ____ 10-0003

[24]Annual Reports of the Secretary of War, 1892-93 (1893), p. 510; 10-0129

and two years later three troops of cavalry (1st, 7th, and 9th) and three infantry companies (15th, 22nd, and 25th) occupied the post.[25]

During the Spanish-American War (1898), troops at Fort Huachuca engaged primarily in a mission to patrol the Mexican border although some of the experienced packers from the post saw duty in Cuba. Following the Spanish-American War, among the possessions in the Spanish imperial system, the Philippines alone offered resistance to American rule. Between 1899 and 1901 American occupation forces engaged in a series of battles from island to island across the Philippines. During this period many troops trained at Forth Huachuca before going to the Philippines to fight. In January 1899, for example, there were 477 officers and enlisted personnel training at the fort and using 307 government-owned horses. Six months later more than 200 had left bound for the Philippines or Fort Bayard, New Mexico, leaving behind only 132 military personnel and 101 horses. After the last large exodus of troops for the Philippines in July 1900, the permanent post garrison was reduced to a minimum with only about 90 to 150 officers and enlisted men occupying the post -- many buildings stood vacant.[26] After America troops suppressed the Philippines uprising, many soldiers and officers recovering from malaria or suffering tuberculosis or other respiratory afflictions requested quarters at Fort Huachuca. Army hospitals all over the United States transferred cases to the salubrious southern Arizona desert for treatment.[27]

The Spanish-American War and the Philippines Insurrection ended with American troops occupying far-flung territories for the first time. In

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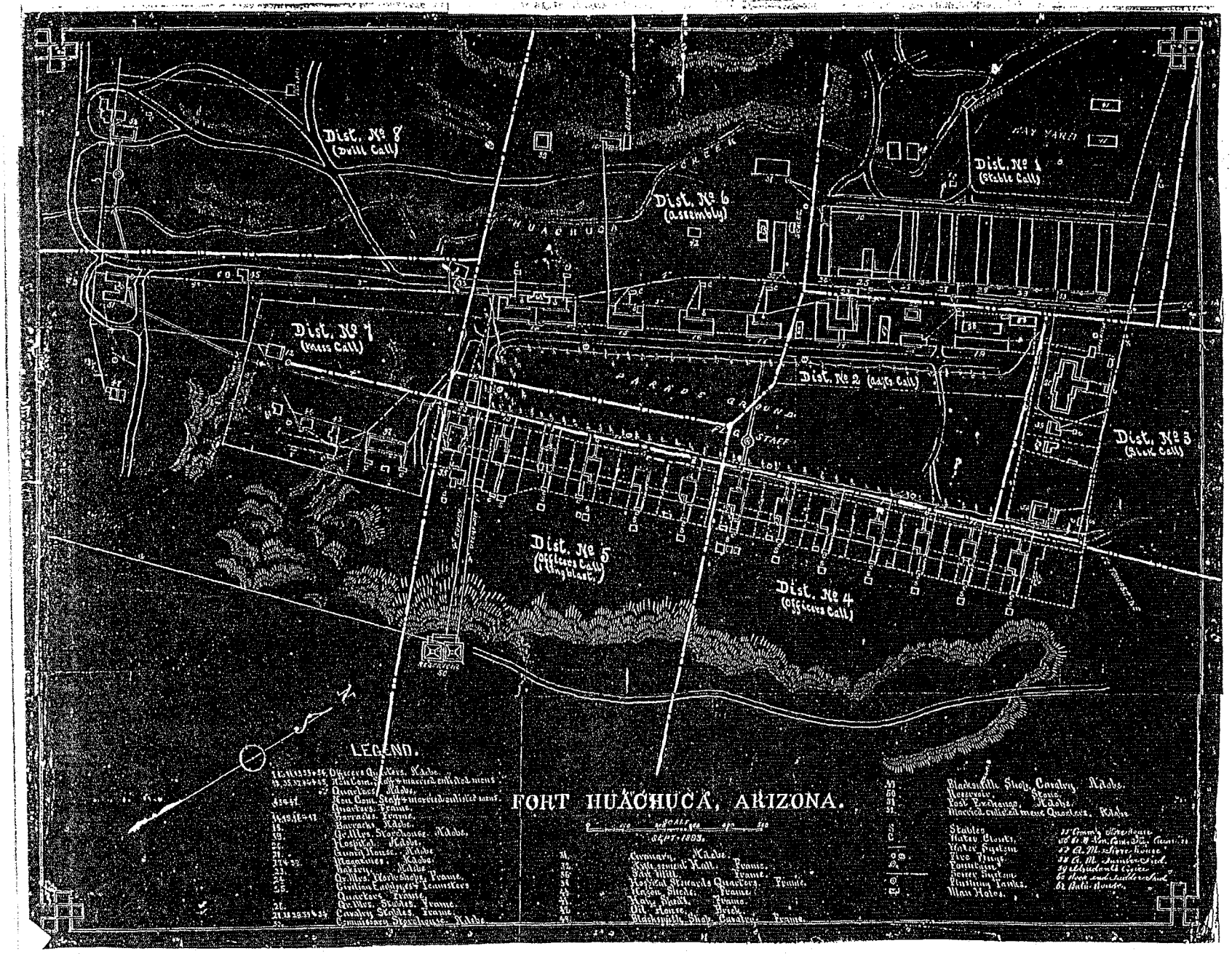
1894, p. 330 10-0033

[25]Smith, 1978, 392.

[26]Post Returns: Fort Huachuca, 1898-1902. Returns from U.S. Military Posts, 1800-1916. Records of the Adjutant General's Office; RG 94. M617, Reels 491-492.

[27]Fort Huachuca Museum History Binders. 10-00??

10-00-9



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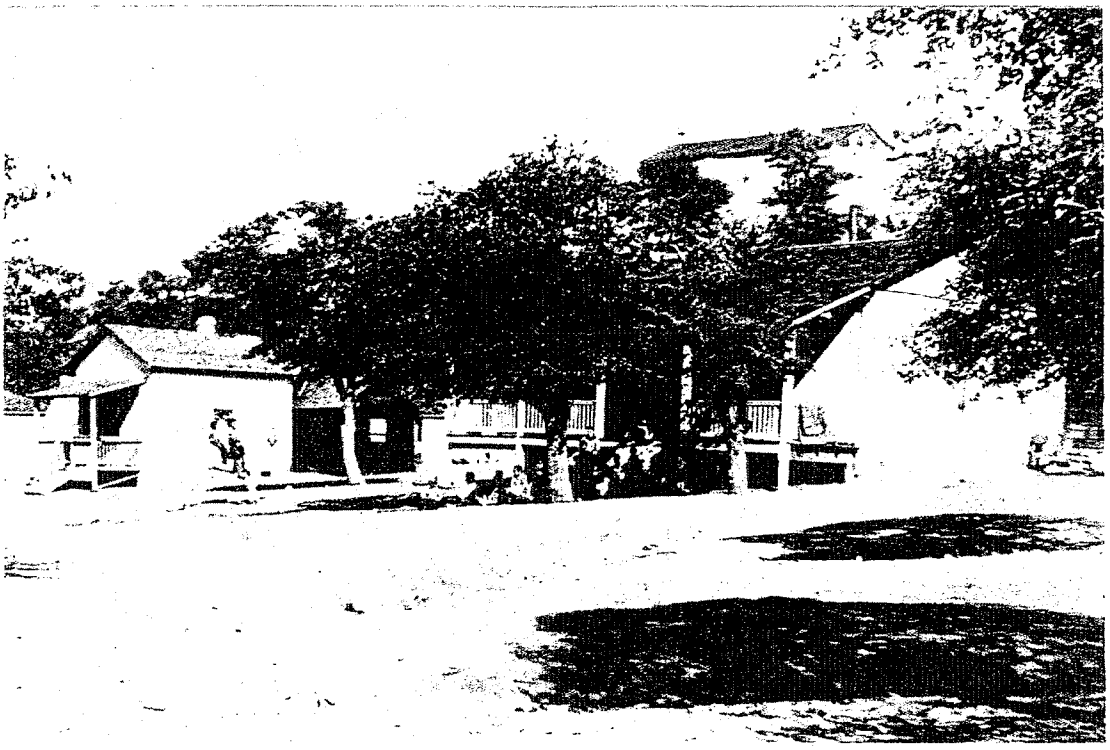
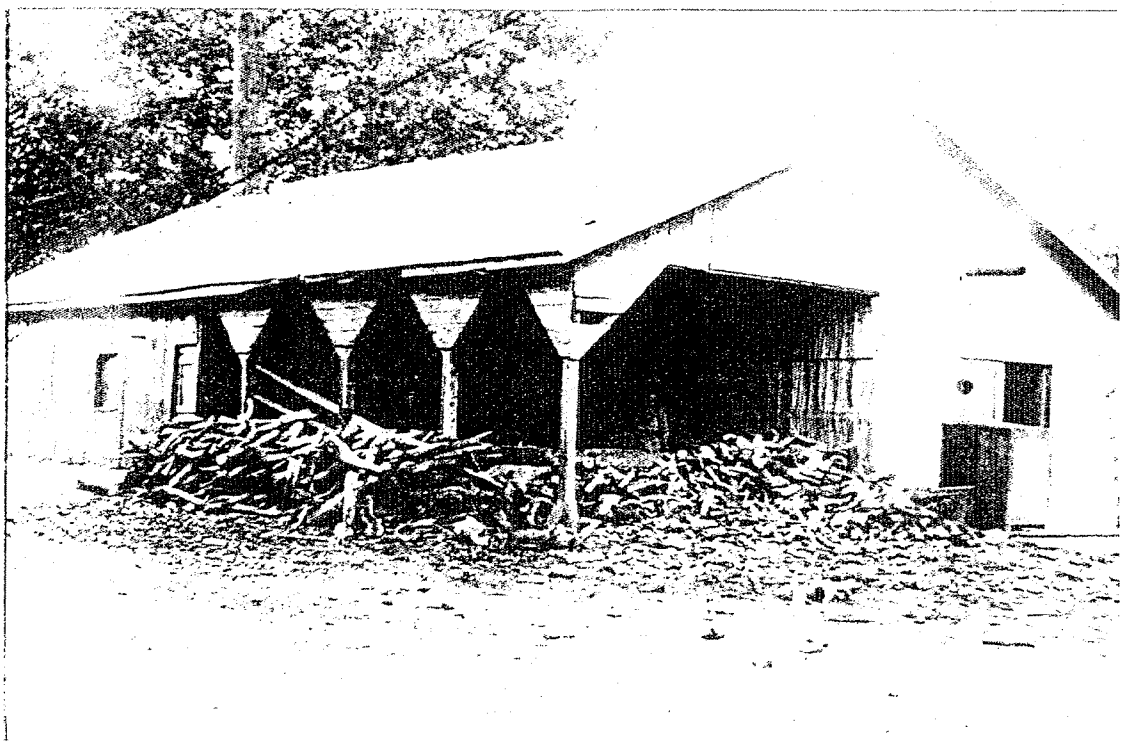
1893



Post reservoir roof is visible on ridge in the background, ca. 1898.



Post sawmill, ca. 1905.

addition, the size of the permanent army had increased from a force of 25,000 in 1898 to 75,000 in 1902.[28] These conditions created logistical and administrative problems for the army never before encountered. In response to these problems, and in keeping with his management philosophy, Secretary of War Elihu Root reorganized the basic command structure within the War Department, leading to creation of the General Staff in 1903. These reforms extended as well to the manner in which military posts were planned, constructed, and operated. On November 11, 1901 Root issued Special Order No. 261 authorizing the organization of a Board of General Officers to study and report upon the location and distribution of military posts required by the army for the accommodation, training and instruction of the army as reorganized under the Act of February 2, 1901. The board presented its findings to Congress in May 1902. It recommended a consolidation of army posts into larger units that could be operated more efficiently while providing greater opportunity for specialized instruction. Furthermore, these larger posts would contain more and better recreational facilities to improve the quality of military life.[29] The report of the board recommended Fort Huachuca as a permanent post for headquarters and four troops of cavalry.[30]

These general reforms, together with the post's designation as headquarters for the 5th Cavalry in March 1904, had a significant impact on the quality of troop housing, work environment, and recreational facilities at Fort Huachuca. The progress of improvements can be charted by the number of civilian engineers, plumbers, painters, carpenters, and masons employed by the post quartermaster for construction projects on the post.

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[28]Matloff, 1969, pp. 350-51.

[29]Matloff, 1969, pp. 347-52; Risch, 1962, pp. 580-83.

[30]War Department. Quartermaster General. "Outline Description of Military Posts & Reservations in the United States & Alaska & Of National Cemeteries, October 1904, pp. 208-09. 10-0041

Civilian Employees at Fort Huachuca, 1904-1904

Month	Year	Number of Employees
June	1903	13
September	1903	14
November	1903	28
January	1904	37
February	1904	25
March	1904	31
April	1904	29
May	1904	22
June	1904	30
July	1904	23
August	1904	23

Four new blacksmith shops, two hay sheds, a carpentry shop, and a riding hall were among the improvements to the cavalry stables area. West of Huachuca Creek, the quartermaster department erected three new buildings for its own use -- a shop and storehouse, stables, and a wagon shed. Non-commissioned officers received five new residential units. Two new flush lavatories replaced the old, unsanitary dry earth closets at the troop barracks. At the south end of the parade ground, the army began construction on a cluster of recreational structures which by 1908 included a post exchange, library, gymnasium, bowling alley, amusement hall, swimming pool (capacity 206,250 gallons), and a chapel.[31]

By 1904 the post had facilities to house 20 officers in single residences or duplexes, a hospital steward quarters, three civilian employees quarters, two residences for families of married enlisted men, barracks for 340 men, and a 28 bed hospital. The cavalry and quartermaster stables together could shelter 396 horses. The Quartermaster Department in October 1904 reported that water still came exclusively from springs in Huachuca

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[31]Record Cards for Descriptions of Post Buildings and Facilities, Fort Huachuca. RG 77, Entry 392, Box 3. 02-0043; Major John P. Wheeler and Capt. W. H. Kasten, *History of the Fifth United States Cavalry, from 1855 to 1927*, (Fort Clark, Texas, 1927, p. 14. 10-0039).

Canyon which was stored in three reservoirs (i.e., the two hilltop basins and the reservoir adjacent the ice machine) having a combined storage capacity of 266,451 gallons. The entire water system had cost the army $4,030.80 and was deemed of good quality and of "generally sufficient" quantity.[32]

The period from 1897 through 1901 was one of above average rainfall at Fort Huachuca. In every year except 1900, rainfall totals exceeded 16.6 inches. The early 20th century post expansion was accompanied by a period of below average rainfall in 1902 and 1903. Reduced spring flows again resulted in water shortages. The army tried to conserve as much water as possible. These efforts included construction of a local storage facility near the banks of Huachuca Creek in 1904 to re-use industrial waste water. Under General Order No. 111 of the Adjutant-General's Office issued on July 29, 1903, each enlisted man in the army stationed south of the thirty-seventh parallel of north latitude was entitled to a ration of ice not to exceed two pounds per day, or 100 pounds per detachment. This regulation required construction of a second ice plant at Fort Huachuca. The new plant, completed in 1904, had a capacity of 3,000 pounds per day and was adjacent to the sawmill located just southwest of the troop barracks on the parade ground.[33] The ice plant machines wasted a considerable quantity of water into the bed of Huachuca Creek. The army recaptured this waste water in a 13,200 gallon stone and concrete reservoir constructed adjacent to the new ice plant. The reservoir stored water and conveyed it by a pipeline to the newly expanded quartermaster and cavalry stable areas.[34]

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[32]War Department. Quartermaster General. "Outline Description of Military Posts & Reservations in the United States & Alaska & Of National Cemeteries, October 1904, pp. 208-09. 10-0041

[33]"Report of the Commissary General, 1904," in Annual Report of the Secretary of War, 1904. Vol. 4, p. 59. 10-0040; Post Museum Narrative Photo. 1905.18.00.02, n.p.

[34]Map of Fort Huachuca, AZ Showing Fences and General Plan of Water

Although it was a significant conservation measure, the new storage reservoir did not constitute a new source of water and therefore did not increase the total amount of water available. During the dry months of an average year only about 50,000 to 60,000 gallons per day flowed into the hilltop reservoirs from the Huachuca Canyon springs and daily average consumption had long outstripped this supply. More water was the crying need of the fort if it was to grow and develop. Officers at the post decided to study whether alternative water sources might be developed elsewhere within the military reservation and transported from a distance to the post water system. In his 1904 annual report to the Secretary of War, the commander of the Southwest Division highlighted the problem of the limited water supply at this frontier fort. Even by adopting severe conservation measures including no irrigation of gardens, grass, or trees, he said the supply was frequently insufficient for the garrison which was designed to house some 400 persons and an equal number of horses. Earlier that year, the commander reported that army officers had surveyed the Huachuca Mountains and completed a preliminary study of the feasibility of piping water from adjacent canyons. Their study concluded that an ample quantity of water for the entire garrison could be obtained for about $42,000 by developing the water supply of Garden Canyon.[35]

Although the army would eventually act on this recommendation, it did nothing immediately to augment the delivery capacity of its water supply system at Fort Huachuca. Perhaps the onset of a wet cycle influenced the army's decision. From 1904 through 1907, Fort Huachuca received abundant rainfall averaging 22.2 inches per year over the four year period. Only 1906 approached an average year (16.13 inches) and in September of that

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and Sewer Systems. Col. C. A. Stedman and Capt. N. F. McClure, quartermaster, 5th Cavalry, January 1, 1906. 04-0004; Record Cards for Descriptions of Post Buildings and Facilities in Series 393, 1922-1941: Fort Huachuca. RG 77, Entry 392, Box 3. 02-0043.

[35] J. M. Hinton, *[Map of] Reservation at Fort Huachuca, AZ: Annotated to show location of water supply. 1907.* RG 92, Blueprint File: Fort Huachuca, Arizona 04-0005; *Annual Report of the Secretary of War, 1904,* Vol. III (1904), p. 97. 70-0027.

year, army officials once again discussed moving Fort Huachuca to another location because of the water situation. The site proposed was one closer to the banks of the San Pedro River where water presumably would be available in greater supply.[36]

In 1908 precipitation returned to normal (15.60 inches), but the following year began the first of a series of three dry years where the average annual rainfall at Fort Huachuca amounted to only 11.1 inches. The drought coincided with an order from the War Department to increase the strength of Fort Huachuca by one battalion. The decision to expand the post, wrote Brigadier-General Earl D. Thomas, commander of the Military Department of Colorado, meant that the matter of developing an additional water source could no longer be delayed.

> The increase of garrison in the near future at Fort Huachuca renders the consideration of additional water supply for that post a pressing necessity. Even with the present strength of the garrison, in seasons of extreme drought, which are always liable to occur in Arizona, the water supply is not any too abundant for the present garrison. Plans and estimates for a new supply of water at Huachuca have been ordered prepared. It is contemplated procuring the additional supply of water from Garden Springs, which are located about 7 miles south of the post, in Garden Canyon. It is the intention to pipe water from these springs to the present post reservoir, and inasmuch as the springs lie together within the reservation, and the pipe line would be in the confines of the reservation, the plan is considered perfectly feasible, and its serious consideration is recommended.[37]

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[36]Post Museum Narrative History, "Expansion to Brigade Post, 1903-16," n.p.; *Map of Fort Huachuca, AZ.* J. M. Hinton. Annotated to show location of water supply. 1907. 04-0005. The great yearly variation in rainfall affected all shallow ground water supplies and greatly impacted grazing conditions. Springs and other shallow watering places in the San Pedro Valley went dry during prolonged periods of drought. On the other hand, periods of ample rainfall such as 1904-1907 and 1913-1915 induces settlers to take up dry farming in the valley. Subsequent drought periods forced abandonment of these homesteads. Kirk Bryan, et. al., 1934, p. 43.

[37]War Department, Annual Reports, 1909 (1909), Vol. III, p. 123. 70-0032

The following year, General Thomas advocated transferring two more troops of cavalry to Fort Huachuca to bring its strength up to a full squadron. Many of the small military posts inherited from the Indian Wars now stood useless, but Fort Huachuca had become of greater strategic significance, wrote Thomas, for two primary reasons: 1) the southeastern Arizona frontier was coming into commercial prominence as a silver and copper mining center which placed additional pressure on the military to maintain law and order; and, 2) reports of armed Mexican revolutionary bands required the army to patrol the border more carefully to maintain neutrality agreements between the United States and Mexico. Unless the army discontinued its "semi-neglect" of Fort Huachuca, Thomas favored abandonment of the old post and establishment of a new one to accommodate at least a squadron of cavalry in the Silver Springs Valley, near Douglas, Arizona. If the army was to remain at Fort Huachuca, Thomas advised the army to undertake extensive restoration work on the existing facilities and expansion of the water supply by conveying water to the post from springs in Garden Canyon. This new source would supply an "abundant" quantity of water for the enlarged post.[38]

In the years following the Philippines Insurrection, troops stationed at Fort Huachuca engaged in garrison duties, field exercises, target practice, and small arms competition with units from other posts. However, as the first decade of the new century drew to a close, soldiers at Fort Huachuca found themselves responding to recurrent incidents at Douglas, Nogales, and Naco along the Mexican border.[39] These incidents posed an increasingly serious threat to peace. Following the end of the regime

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[38]"Report of the Department of Colorado," War Department Annual Reports, 1910 (1910) Vol. III, p. 129. 70-0033. Extensive settlement of the Douglas Basin had begun with the coming of the railroad from Bisbee to the copper smelters at the divided border townsite of Douglas in 1902.

[39]Post Returns: Fort Huachuca, 1904-1910. Returns from U. S. Military Posts, 1800-1916. Records of the Adjutant General's Office. RG 94; M617, Roll 492.

of Diaz in 1911, Mexico entered a long era of political turmoil. The revolution spread quickly in the northern states of Mexico, a stronghold of those opposed to central control by the federal government. On April 28, 1911 Mexican and federal troops and rebels fought in the streets of Agua Prieta showering bullets across the border into Douglas, Arizona. Alarmed that the Mexican revolution would spill across the border, President Taft ordered more troops to the southwest to strengthen border patrols. Between January and June 1911 the number of troops stationed at Fort Huachuca increased from 150 to 901 men with an accompanying increase in horses from 136 to 879. The army transferred the entire 6th Cavalry Regiment with its 41 officers and 712 men to Fort Huachuca, the first time an full cavalry regiment was stationed at the post. To accommodate the new forces, the post quartermaster received an appropriation of $110,000 to build troop barracks, cavalry stables, officer's housing, and expand the water system into Garden Canyon.[40] In August surveyors laid out a route for the Garden Canyon pipeline and by the end of October 1911 the 45,000 foot long, eight inch diameter steel water line had been completed at a cost of $38,186.76.[41] The army then built collection works near the junction of Garden and McClure Canyons with small pipelines running up the canyons to several springs. The water was conveyed some seven miles from the collection works to the post's 250,000 gallon masonry storage reservoir and a small 4,000 gallon capacity tank located near Carnahan Hill.

Investigations to enhance the post water supply continued as the army discussed enlarging Fort Huachuca to a brigade-sized post. In 1912 many

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[40]Post Returns: Fort Huachuca, January 1911 and June 1911. Returns from U. S. Military Posts, 1800-1916. Records of the Adjutant General's Office. RG 94; M617, Roll 492; "Adjutant General's Report," War Department Annual Reports, 1911 (1912), Vol. I, Table A; Post Museum Narrative History, "Expansion to Brigade Post, 1903-16," n.p. 70-0094

[41]"Report of the Quartermaster General," War Department Annual Reports, 1912, Vol. I, p. 542. 70-0035. This new water supply line had been under consideration for a number of years. In 1909 First Lieutenant Lawrence R. Butler, 2nd Infantry, had prepared a map of the proposed pipeline for the Office of the Chief Quartermaster, Department of Colorado, see RG 92, Box 426 32313 QMGO. 01-0019.

small-bore test holes were sunk near the mouths of Garden and Huachuca Canyons. According to one report, some of these test wells were put down to a depth of 1000 feet, but none showed great promise. The exploration resulted in only one new eight inch diameter well in Garden Canyon. The army installed an air lift pump at the well site, but as only 70 gpm (or about 50,000 gpd) could be obtained from this well, and only for short periods of time, it could only be effectively used as an emergency supply to augment flows during periods of drought.[42]

In 1913 a full-scale civil war broke out in Mexico and troops from Fort Huachuca responded once again. In February after ten days of battle in the streets of the capitol, General Victorio Huerta siezed the office of the presidency and assassinated his challenger, Gustavo Madero. President Woodrow Wilson, in a shift of traditional American policy, refused to recognize Huerta on constitutional grounds. Rebel forces continued to challenge federal authority in the northern state of Sonora, especially at Nogales, a border town that for years had been the object of contending Mexican political and bandit factions. Troops G and A, 5th Cavalry from Fort Huachuca were sent to patrol the international border in March where they participated in a skirmish at Nogales.[43]

Following an inspection of Fort Huachuca by Secretary of War L. M. Garrison in August 1913, the War Department decided to station the "buffalo soldiers" of the 10th Cavalry at Fort Huachuca and ordered the post quartermaster to make plans and cost estimates for increasing the post from regiment to brigade-size. The building program in 1914 resulted in the construction of five double sets of officers quarters, two company barracks, one cavalry stable, additions to the commissary and hospital,

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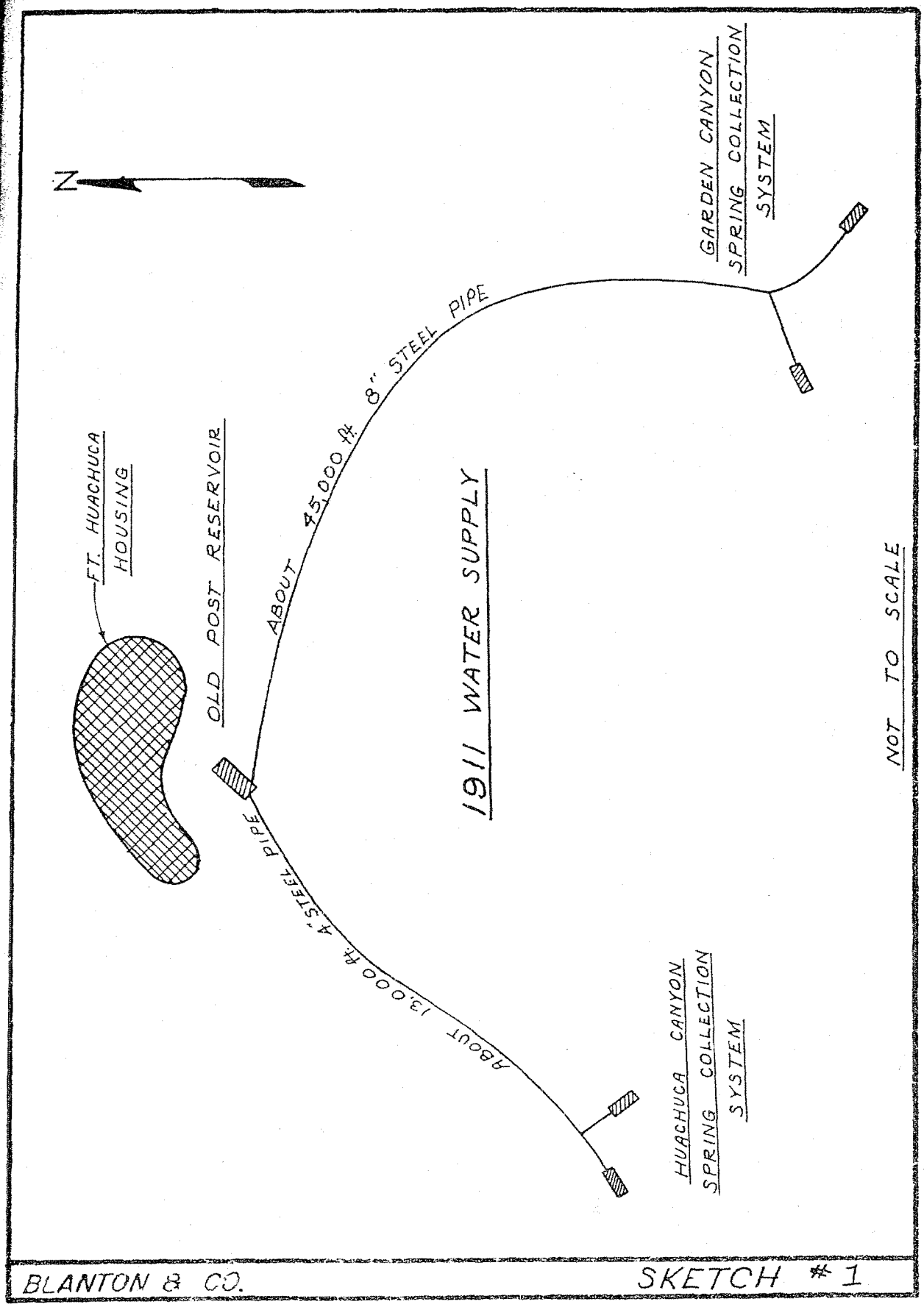
[42]S. F. Turner and E. M. Cushing, "Ground Water Supplies in the Fort Huachuca Area, Cochise and Santa Cruz Counties, Arizona," in Annual Report of Medical Department Activities at Fort Huachuca, Arizona, February 10, 1942. World War II Administrative Records, 1940-1949. 319.1 Unit Annual Reports, Box 170. RG 112, Office of the Surgeon General, Army, p. 1. 02-0014.

[43]Smith, pp. 159-65.



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and extension of water distribution and sewer systems to the new buildings. The 10th Cavalry remained the sole military unit at the fort until 1927.[44]

For a while in April 1914 following the American landing of 8,000 troops at Veracruz and the occupation of the city, it appeared that war with Mexico was inevitable. However, under an agreement made between Wilson and Huerta, the Mexican leader agreed to resign. In July he fled from Mexico City and was succeeded by Venustiano Carranza. Carranza had barely time to assume office when his onetime ally, Francisco "Pancho" Villa, rebelled and proceeded to gain control over most of northern Mexico. Occupation of Veracruz had intensified anti-American feeling in Mexico and when President Wilson recognized Carranza's government, Villa decided to show his resentment by raiding into the United States. A series of border attacks culminated in a surprize raid on Columbus, New Mexico, by Villa's troops on March 9, 1916. The same day Colonel William C. Brown at Fort Huachuca learned of the raid and received orders from cavalry brigade headquarters in Douglas to ready his troops for service. By 4 P.M. all the 10th Cavalry, minus Troops L, M, and the Band (about 22 officers and 450 enlisted men) left Fort Huachuca for the designated rendezvous point, Culbertson Ranch, New Mexico. Within a week, the War Department had assembled about 5,000 regulars under Brig. Gen. John J. Pershing and sent them into Mexico to assist the Mexican Government in capturing Villa. Pershing's troops chased Villa through unfriendly territory for hundreds of miles, dispersing his followers but never capturing Villa. Carranza soon showed that he had no desire to have the United States Army do his job for him. After fighting a brief skirmish with Pershing's troops at Parral on April 12, 1916, Carranza demanded his withdrawl. Pershing agreed to withdraw gradually provided that Carranza could control Villa. Pershing's troops did clash with Mexican Government troops, the most serious incident occuring at Carrizal in June. This action prompted President Wilson to

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[44]Post Museum Narrative History, "Expansion to Brigade Post, 1903-16," n.p.

call out the National Guard of Texas, New Mexico, and Arizona before a plan for evacuation of Pershing's troops was determined in January 1917. Although Pershing failed to capture Villa, the dispersal of his band put an end to serious border incidents.[45]

When the U.S. declared war against the Central Powers in Europe in 1917, the troops at Fort Huachuca had just returned from the Punitive Expedition into Mexico. During the expedition, there were more than 1000 officers and enlisted men with about 850 horses attached to Fort Huachuca. Between April and June 1917 some 800 recruits joined the veterans of the Mexican Campaign at Fort Huachuca to train for possible deployment overseas. Although individual officers were detached and assigned overseas duties and 62 N.C.O.'s received commissions, the 10th Cavalry never saw action in Europe and spent the war years guarding and patrolling the Mexican border. There were several skirmishes in 1917-18 with Yaqui Indians who crossed the border into southeastern Arizona to work in the cotton fields and mines and used their wages to purchase guns and ammunition to smuggle back into Mexico. Speculation that German *agents provocateur* were operating along the border led to a skirmish between a group of well-armed Mexicans and troops of the 10th Calvary and 35th Infantry in the town of Nogales in August 1918. Two officers, three enlisted men and several American citizens were killed and two officers and 29 men were wounded in the battle.[46]

During World War I several buildings were erected to meet the needs of the more than 1,000 enlisted men and officers who now made up the 10th Cavalry at Fort Huachuca. Between 1915 and the United States entry into

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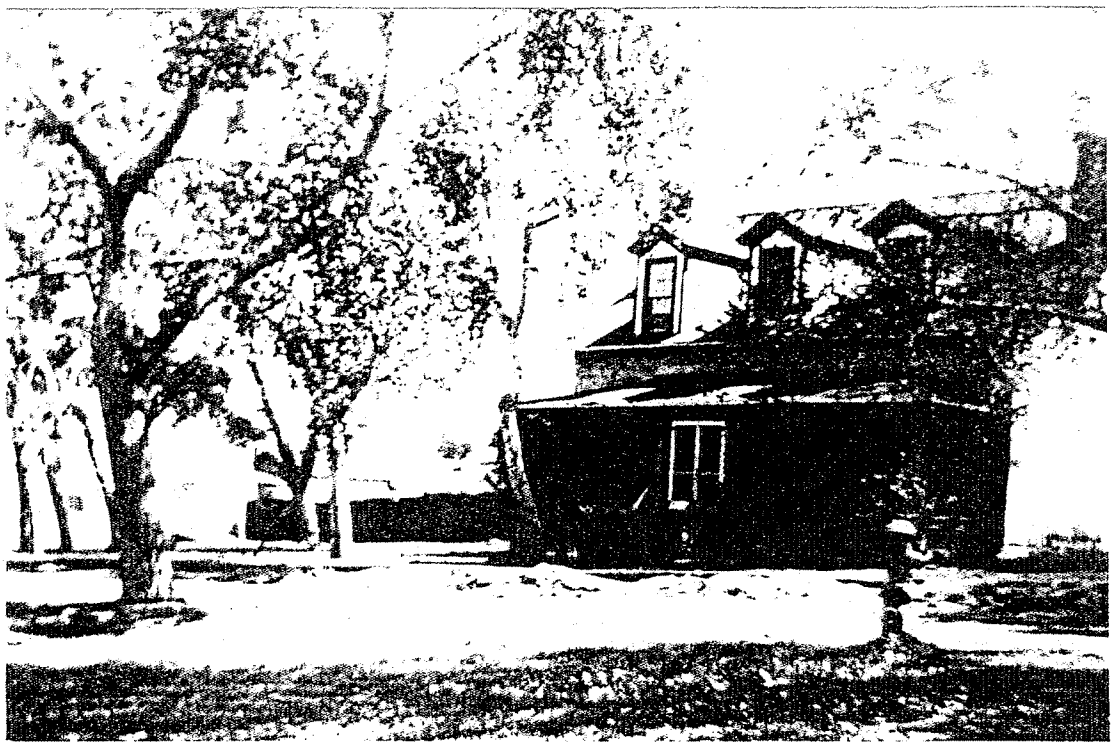
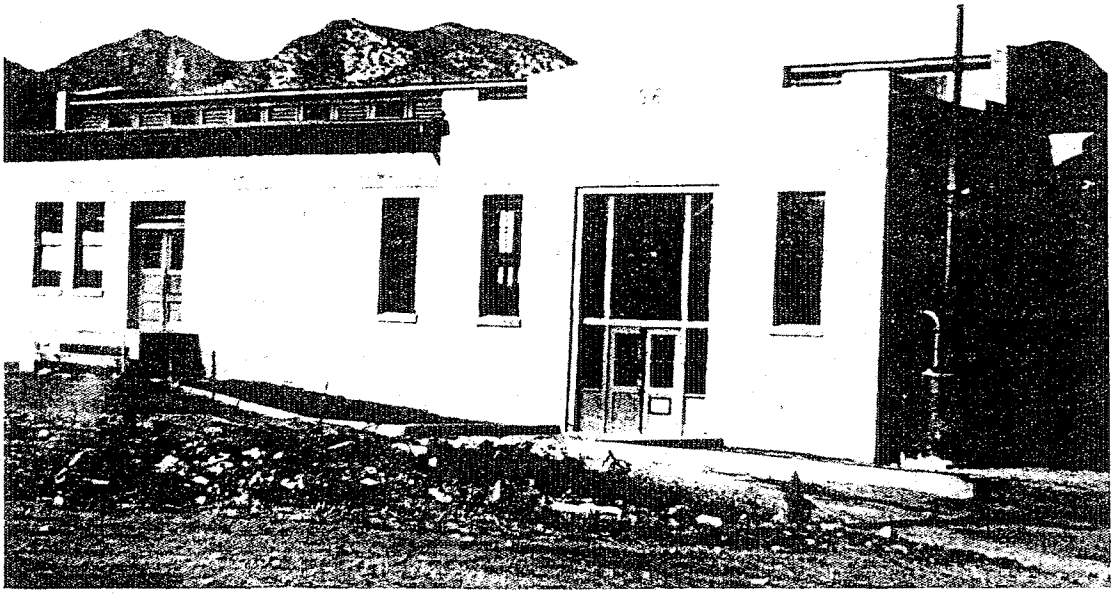
[45]Frank E. Vandiveer, Black Jack: The Life and Times of John J. Pershing (College Station: Texas A & M University Press, 1977), vol. II, pp. 595-668; Haldeen Braddy, Pershing's Mission into Mexico (El Paso: Texas Western Press, 1966), 1-82; Frank Tompkins, Chasing Villa: The Story Behind the Story of Pershing's Expedition into Mexico (Harrisburg, Pa.: Military Service Publishing Co., 1934).

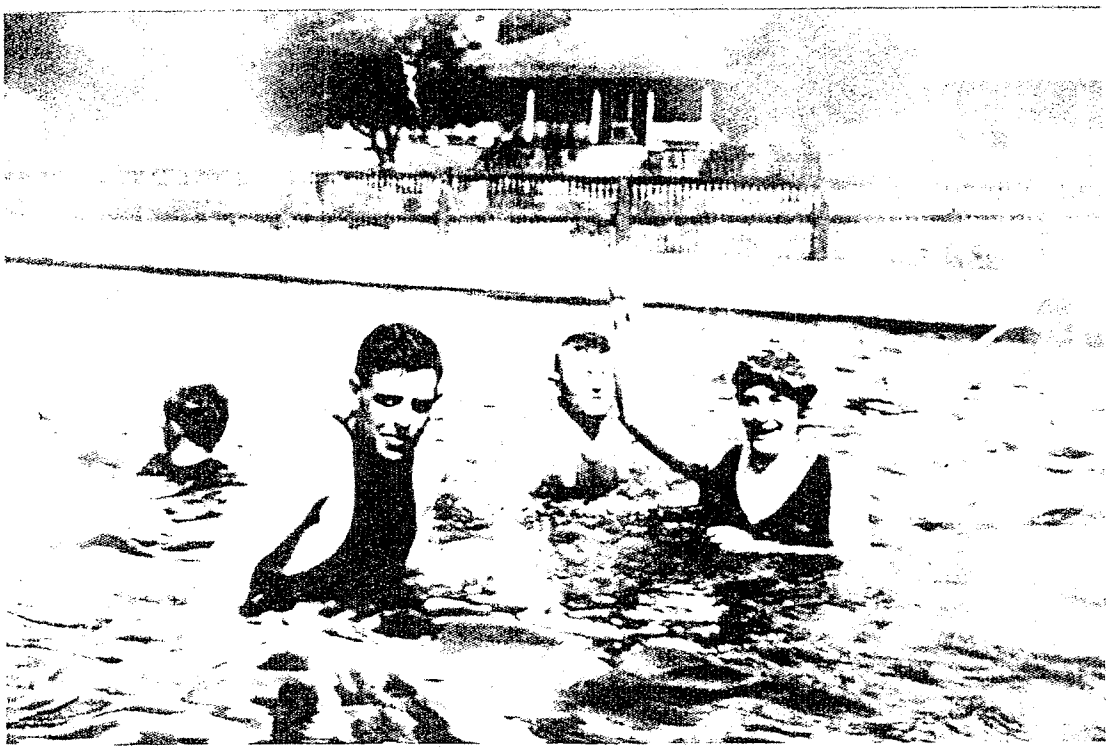
[46]Post Returns: Fort Huachuca, January 1916 and June 1916. Records of the Adjutant General's Office; RG 94; M617, Reel 492; Smith, pp. 211-218.



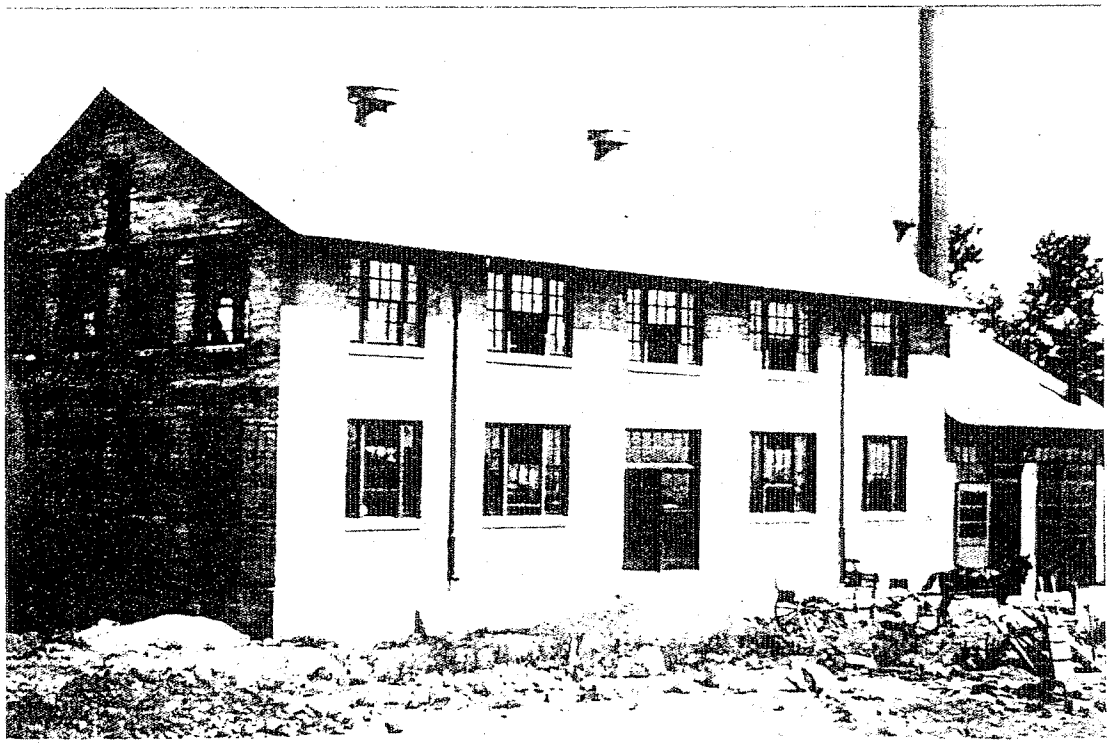
Fort Huachuca Officer's Quarters ca. 1914. A fire hydrant is visible at lower right.



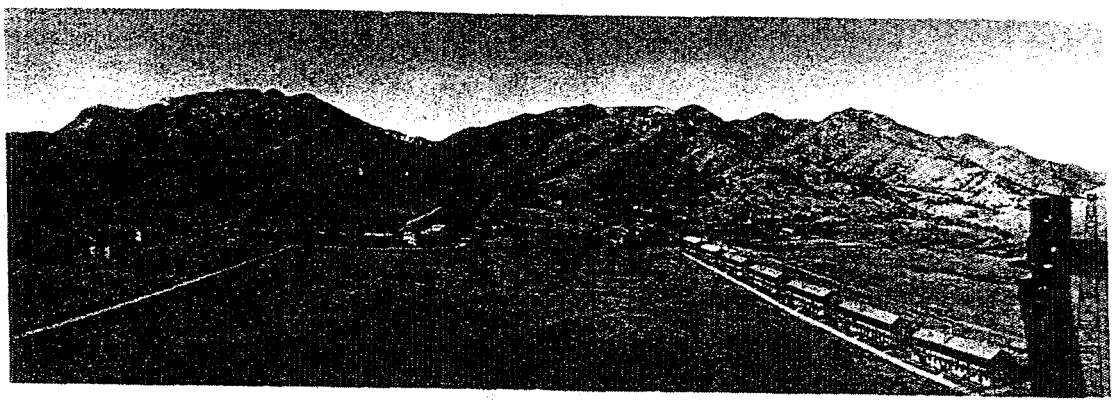
Fort Huachuca ice plant, ca. 1916.



Bathers in a post pool, 1916.



Post laundry, ca. 1917.



Panorama of Fort Huachuca taken from post radio tower, ca. 1917.

Huachuca Creek flowing past Quartermaster offices, ca. 1918. This building now houses the post DEH.

World War I in April 1917, new housing construction at the post included four troop barracks, one band barrack, a machine gun platoon barrack, the quartermaster corps barrack, six sets of officer's duplexes, a BOQ to house eight officers, and 14 NCO quarters. To accomodate the additional horses and supplies the army added nine stables and two storehouses. One new administration building was built on the parade ground and the guardhouse was expanded. To more adequately provision the troops with fresh dairy products, the army granted grazing rights for 50 cattle and their calves and leased two acres of land to Richard M. Johnson of Garces, Arizona, to operate a dairy upon the military reservation. The army also began construction of new facilities in an area at the northwest corner of the old post reserved for industrial uses. The army completed a new ice plant, a post laundry facility, and an electric power plant. The new diesel engine-powered electric plant replaced an old dynamo and steam-driven unit. With the operation of the new power plant, the army discarded the kerosene lamps that had illuminated residences since 1877 and installed a general system of electrical wiring for lighting and power throughout the post. Finally, during the years 1916-17 the army spent more than $30,000 to extend its water distribution lines and sewer systems to all the new buildings erected during the World War I era.[47]

Colonel Frederick T. Arnold replaced Colonel Cabell as post commander in February 1918. He arrived from California with his wife some eight months before the armistice ended the war in Europe. It was a very dry period in southeastern Arizona, and despite the improved water supply system with its connection in Garden Canyon, continued reliance on springs resulted in water shortages at the post during periods of drought. Only one-tenth of an inch of rain fell during the Arnold's first three months

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[47]Post Museum Narrative History, "Expansion to Brigade Post, 1903-16," Photo. 1917.06.10.01, n.p.; "Report of the Quartermaster General," War Department Annual Reports, 1915 (1916), v. I, p. 290; "Report of the Quartermaster General," War Department Annual Reports, 1916 (1916), vol. 1 p. 360; 1917 (1918), v. II, Exhibit No. 2; "Report of the Quartermaster General," War Department Annual Reports, 1915 (1916), vol. I, p. 360. 70-0038, 70-0039, 70-0040.

at Fort Huachuca. June 1918 brought only two-thirds of an inch. Early in April, Mrs. Arnold commented in her diary on the conservation measures adopted to counter the severe water shortages:

> The post water supply is getting low and they say in mid-summer it is quite a problem to get enough water from the springs up in the mountains because we will have no rain until fall. [Having just arrived from California, she still had a poor understanding of precipitation patterns in the southwest.] Last evening the quartermaster phoned that the reservoir was empty and so the water was off nearly all night filling the reservoir for today.[48]

The post experienced intermittent water shortages throughout the spring. During the days when water was in short supply, Mrs. Arnold would observe horses being watered at the two post swimming pools. On the other hand, in spite of the fact that virtually no rain had fallen for more than two months, Mrs. Arnold noted during one period in May that the water crisis had temporarily eased enough that the hilltop reservoirs filled to capacity and overflowed at night providing water for the irrigation ditches and the parched cottonwood trees that lined them. But as summer came on, the water supply again became dangerously low. By late June, each day the quartermaster was cutting off the water supply to residences about dinner time and kept it off until morning.[49]

Soon after the armistice of November 1918 the War Department asked Congress to authorize the organization of a permanent regular army of 600,000 and a universal three month training system. Congress rejected the proposal. Within nine months, the War Department demobilized nearly 3,250,000 officers and men. By the end of 1919 the active army was reduced to a strength of about 19,000 officers and 205,000 enlisted men. However, revolutionary disturbances in Mexico in 1919 and 1920 kept troops from Fort Huachuca busy guarding the border. The fort underwent a moderate

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[48]Smith, p. 225.

[49]Smith, p. 225-226.

expansion program in 1920 as non-commissioned officers returned from the war and settled into routine garrison life. In 1920 the army constructed 39 new NCO residences at the southern end of the old post, built a new officer's club, a hostess house, four quartermaster shops, and the first sewage treatment facility at the post.[50]

Because of the water shortages experienced in 1918, the following year the army decided to incorporate additional springs up in Garden Canyon into the water system and to improve several old springs by construction of inlet boxes. When periodic shortages continued, the army constructed small concrete check dams to trap surface flows from deep springs located between already developed springs in the canyons. The army also built impounding works to conserve the overflow from the old post reservoirs. Colonel George P. White, the executive officer in charge of training, education, and recreation at Fort Huachuca, is credited with construction of the first concrete dam on Soldier Creek in 1919 or 1920. The dam had three functions: to impound water for recreational uses, to supply water to the post dairy, and to store irrigation water for an expansion of the post garden from seven to thirty-five acres.[51]

In March 1920 the weather station at Fort Huachuca, maintained by the

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[50]Matloff, 1969, pp. 405-07; Record Cards for Descriptions of Post Buildings and Facilities in Series 393, 1922-1941: Fort Huachuca. RG 77, Entry 392, Box 3. 02-0043.

[51]S. F. Turner and E. M. Cushing, "Ground Water Supplies in the Fort Huachuca Area, Cochise and Santa Cruz Counties, Arizona," in Annual Report of Medical Department Activities at Fort Huachuca, Arizona, February 10, 1942. World War II Administrative Records, 1940-1949. 319.1 Unit Annual Reports, Box 170. RG 112, Office of the Surgeon General, Army, p. 1. 02-0014; S. S. Headman, "Completion Report Cantonment Construction: Fort Huachuca, Arizona, May 10, 1941." Construction Completion Records, 1917-1943: Fort Huachuca-4. RG 77 Box 134, p. 20. 02-0013; Brevet Major General George W. Cullum, Biographical Register of the Officers and Graduates of the U.S. Military Academy (Chicago: Lakeside Press, 1930), vol. VII. n.p. Fort Huachuca History Binder, 1921-1933, Forth Huachuca Post Museum, 10-0045.

U.S. Army Post Surgeon since 1886, closed. Observations were not taken for 34 years until it was re-established by the Aviation and Meteorological Department in September 1954. Precipitation records from nearby stations at Elgin, Bisbee and Tombstone indicate that rainfall was below normal throughout the region during the decade of the 1920s in only three years: 1920, 1924 and 1928.[52] During the decade the army tried on several occasions to augment water supplies by detailing post personnel to build concrete inlet boxes, dams and catch basins in Garden and Huachuca canyons. Undertaken by army personnel who were not skilled in water works engineering, these improvements were never very satisfactory.[53] By 1926 water demand at the post had increased to approximately 300,000 gallons per day; yet the summer flow from springs during dry years on occasion dropped to as little as 70,000 gallons per day.[54]

In March 1928 the Third Battalion, 25th Infantry from Nogales joined the 10th Cavalry at Fort Huachuca. They were "squeezed in," filling the post to capacity and necessitating an expansion of the original 1916 electric power plant with two 250 horsepower diesel engines and the refrigeration plant, completed in November 1929. The 25th Infantry arrived at the post in a year when rainfall was probably below normal. According to the reminiscences of Captain Vance Marchbanks, in 1928-1929 "the water wizards" began setting off blasts of dynamite trying to get a larger flow from the springs in Huachuca Canyon, but their efforts failed. "The[y] cracked the bedrock and the entire stream went below," wrote Captain Marchbanks. Thereafter, he noted, the bulk of the water supply for the old post

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[52]Green and Sellars, eds. *Arizona Climate* (Tucson: University of Arizona Press, 1969), pp. 15-16, 169-170, 191-192, and 427-429.

[53]"Military Construction Line Item Data: Development of Spring Water Supply in Huachuca and Garden Canyons," September 15, 1966. p. 4. Hayden 306:20. Arizona Collection, ASU. 20-0014.

[54]S. S. Headman, "Completion Report Cantonment Construction: Fort Huachuca, Arizona, May 10, 1941." Construction Completion Records, 1917-1943: Fort Huachuca-4. RG 77, Box 134, p. 20. 02-0013

came from Garden Canyon until the wells were sunk near the Sierra Vista Gate in the 1930s.[55] This story of the "water wizards" is corroborated in part by a 1942 report on groundwater supplies in the Fort Huachuca area by S. F. Turner and E. M. Cushing of the United States Geological Survey. They reported that a few of the springs on the fort had been blasted in an effort to increase water supply, but instead the limestone springs were lost to some lower fault zones. Blasting did not increase the flow of any springs. Later, they noted, the army experimented with concentrating flow into a central spring through excavation of tunnels. These efforts were more successful.[56]

Major G. H. Huddleson, post quartermaster, reported on the Fort Huachuca water supply system as it existed on January 22, 1930. In general, he wrote, the water supply system was adequate except during drought when the post commander had to issue orders to conserve water and prevent waste. The water system only served individuals or units within the boundaries of the military reservation. He suspected that some of the older four and six

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[55]Post Museum Narrative History, "Expansion to Brigade Post, 1903-16," n.p. and "World War I and After, 1918-33," n.p. The practice of "torpedoing" wells to increase production went back to 1862 when Colonel E. A. L. Roberts conceived of the idea of exploding torpedoes in oil wells. The first experiments at Titusville, Pennsylvania in 1865 proved successful. Great excitement followed and brought "torpedoing" into general practice. Explosives were used to some extent in water wells for the purpose of increasing supply and creating a reservoir for the water. Where water was drawn from rock, fissuring the rock was suppose to increase the area from which delivery was made to the pumping apparatus. In limestone formations, where the underground water ran more or less in definite channels instead of percolating slowly as a broad and thick sheet, the torpedoing of a well was done to increase the number of contributing veins. Isaiah Bowman, "Well Drilling Methods," *USGS Water Supply Paper No. 257* (Washington, D.C.: Government Printing Office, 1911), pp. 100-102.

[56]S. F. Turner and E. M. Cushing, "Ground Water Supplies in the Fort Huachuca Area, Cochise and Santa Cruz Counties, Arizona," in Annual Report of Medical Department Activities at Fort Huachuca, Arizona, February 10, 1942. World War II Administrative Records, 1940-1949. 319.1 Unit Annual Reports, Box 170. RG 112, Office of the Surgeon General, Army, p. 4. 02-0014.

inch distribution pipes on the post proper leaked but it was difficult to repair them because in many cases their exact location was unknown. The distribution system, however, maintained enough pressure for adequate fire service at both the highest and lowest hydrants.

The source of the main water supply for the post, wrote Huddleson, was still from springs in Huachuca and Garden canyons, exclusively. The 253,261 gallon capacity hilltop reservoirs, in operation since 1884, received water from Huachuca Creek through the original four inch cast iron pipe and from Garden Canyon through nine miles of eight inch cast iron pipe installed in 1912. Although Huddleson reported that the water was pure and did not require filtration or chemical treatment, in February 1928 the army had installed a Wallace Tiernan chlorination unit to ensure the chemical purity of their domestic water supply. Sometime prior to 1930 a water meter was also installed at the site of the reservoirs, however, individual residences were not metered.

As the 1930s approached, the army stood poised to make several important decisions of increasing the delivery capacity of the post water system. Planned improvements for the Huachuca Canyon system included replacing the old four inch pipeline constructed in the 1880s with a larger six inch pipe. In 1929 the Quartermaster General had authorized Huddleson to begin planning for improvements to the Garden Canyon water system including drilling a deep well. Upon the recommendation of a former post engineer, the army had already acquired sufficient ten inch pipe to increase the capacity of the system for the first mile, or to about the first T-valve located in the vicinity of the old post gardens. Besides the reservoirs on the hilltop overlooking the post, the fort possessed a second 13,200 gallon capacity reservoir adjacent to the ice plant near Huachuca Creek. Huddleson noted that in 1929-1930 the Vocational Training Section was at work erecting a new dam (or perhaps raising the 1920 one) on Soldier Creek. The new dam, approximately 15 feet high with an 80 foot crest, would bring the capacity of the reservoir up to about 1,000,000 gallons. The reservoir impounded overflow from the hilltop storage facilities during the rainy season, storing it until the summer months

when it was put to beneficial use at the post garden. Huddlson also reported that the army was in the process of installing a 90,000 gallon redwood storage tank at the Target Range located at the eastern base of the Huachuca Mountains. A four inch T-valve from the Garden Canyon pipeline supplied the target range area as early as 1912, but as the army put more emphasis on preparedness and training exercises in the post-World War I era, use of the range during the summer months increased. Without storage capability the water supply was insufficient to meet the "extra thousand per capita on the supply" during peak training season.[57]

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[57]"Fort Huachuca Water Supply System, January 22, 1930." 8th Corps Area, Quartermaster Planning 1905-1941. RG 394, Box 22, Entry, 266. WNRC, Suitland. 02-0003; Aerial Photographs of Fort Huachuca, 1929, showing Post Reservoir Overflow. Fort Huachuca: Historic Records of Buildings, 1905-1942. File 60 F 7 and 70 F 7. RG 77, Entry 393, Box 94. 02-0001 and 02-0002.

DEVELOPMENT OF THE EAST GATE WELL FIELD AND ~~CONSTRUCTION OF~~ FORT HUACHUCA, 1930-1945.

EXPANSION OF

Background

In the Sonoran Desert of Arizona temperatures soar above 100 degrees during the summer and average annual precipitation is below fifteen inches. Although rainfall is low and evaporation high, prior to the irrigation age precipitation in the highlands provided enough water to maintain a variable flow in the Gila River and its major tributaries, the Salt, San Pedro, and Santa Cruz and to supply underground aquifers. Sediments in the alluvial desert basin constitute large storage areas for groundwater, and the occurrence of these large water reserves has made it feasible for people to live prosperously and comfortably in this desert environment. Groundwater, like surface water, have their origin in rainfall. Most groundwater, after falling as precipitation, has flowed on the surface in creeks or rivers before finding its way underground. After absorption into the ground the water percolates along in the same general direction as the nearby surface stream, but spreading out wider and deeper than the stream channel.

Groundwater supplies of the San Pedro Basin are developed largely in the saturated zone of valley-fill sediments. The alluvial sentiment mantle in the Basin and Range lowlands is several hundred to thousands of feet thick. Water from the mountain streams seep through the sandy materials in the channels and move downward by the force of gravity into the lowland basins. It forms a saturated zone overlying the impervious rock that forms the bottom of the basin. Over the millennia, the groundwater has filled a large amount of the pore space in the sediments. Water used by people in the basin is obtained by diverting surface and groundwater from the system.

The Huachuca Mountains are a protrusion of granite and limestone that extends up through the bed of the valley and the alluvial sediment. The mountain range forms a southern cut-off wall for water in the underground

reaches of the San Pedro Basin. The basin itself consists of a deposit of sedimentary erosion sand made up of decomposed granite and clays of a porous nature that permit percolation of water. In general, the depth of the surface this underground water lies at a hydraulic gradient equal to the flow line of water flowing through gravel to the San Pedro surface water level.[1]

By 1900 the existence of subsurface water below the arid plains west of the 100th Meridian was widely known. The "underflow" and artesian investigations by Richard J. Hinton and the Water-Supply and Irrigation Papers of the U.S. Geological Survey (USGS) did much in the 1890s not only to map the subsurface water, but also to publicize its existence. Several USGS reports included some investigation of underground water in the Gila River Basin, but all were focused on the main stream of the river. F. H. Newell, chief hydrographer for the USGS, published a paper on the hydrography of the arid regions in 1891 in which he summarized what was generally known regarding the water resources of the Gila River Basin.[2] Six years later, Arthur P. Davis, who was Newell's chief assistant, completed an investigation of the water resources available for irrigation purposes on the Gila River Indian Reservation in Arizona. The principle purpose of this study was to discover reservoir sites to impound surface flows, but he paid some attention to groundwater.[3] This study was followed in

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[1]S. G. Brown, E. S. Davidson, L. R. Kister, and B. W. Thomsen, "Water Resources of Fort Huachuca Military Reservation, Southeastern Arizona," *Geological Survey Water Supply Paper 1891-D (Washington: GPO, 1966).*

[2]Frederick H. Newell, "Hydrography of the Arid Regions of the United States," *12th Annual Report of the U.S. Geological Survey,* Part II (1891), pp. 213-361. Newell notes that by 1890 a total of 2,672 acres of land were under cultivation in the San Pedro Valley. There were 10 irrigation canals. By 1899 there were about 3,500 irrigated acres and 41 canals. Newell, "Report on the Progress of Stream Measurements for the Calendar Year, 1899," *U.S.G.S. 21st Annual Report* Part 4 (Washington: Government Printing Office, 1900), pp. 352-354.

[3]Arthur P. Davis, "Irrigation Investigation for the Benefit of the Pima and Other Indians on the Gila River Indian Reservation, Arizona,"

1900 by J. B. Lippincott's investigation entitled *Storage of Water on Gila River, Arizona.* His work was largely devoted to the irrigation question in the Gila Valley and storage and distribution of its surface waters. The San Pedro River Basin and the upper Gila River were explored as a part of this study by Cyrus C. Babb, a USGS hydrographer, but his investigations were largely confined to measurements of canal diversions and return flows to the river from irrigation.[4]. In 1904 Willis T. Lee studied the availability of underground water for Indian lands in the Gila River Basin, but his study was limited in scope to the region between The Buttes, 12 miles east of Florence, to the junction of the Gila and Salt Rivers.[5] That same year, Lee published a paper on groundwater in the San Pedro Basin in the vicinity of Benson.[6] Comprehensive groundwater studies of the San Simon and Douglas basins followed in the 1910s.[7]

Sen. Doc. 27, 54th Congress, 2nd Session (1897).

[4]Joseph B. Lippincott, "Storage of Water on Gila River, Arizona," *Water Supply and Irrigation Paper of the USGS, No. 33* (Washington: GPO, 1900), pp. 14-17.

[5]Willis T. Lee, "The Underground Water of Gila Valley, Arizona," *Water Supply and Irrigation Paper of the USGS, No. 104 (Washington: GPO, 1904).*

[6]Lee notes that the first reported occurrence of groundwater under artesian pressure in the San Pedro Basin appeared in 1887 when as a result of a strong earthquake fissures formed from which water flowed for several hours. This led to the supposition that water existed under pressure beneath the surface of the valley, drilling soon followed resulting in flowing wells. The first artesian well in San Pedro Valley was drilled in 1892 and by 1903 more than 200 wells were in use in the vicinity of Benson and Fairbank. W. T. Lee, "Notes on the Underground Water of the San Pedro Valley, Arizona," *Third Annual Report of the U. S. Reclamation Service, 1903-1904.* 58th Congress, 3rd session. H DOC No. 28, 2nd ed., pp. 165-170.

[7]O. E. Meinzer and F. C. Kelton, "Geology and Water Resources of Sulphur Springs Valley, Arizona." *U.S.G.S. Water Supply Paper No 320* (Washington: Government Printing Office, 1913); R. H. Forbes, "Groundwater

The first detailed investigation of underground waters in San Pedro Valley was undertaken in 1926 by Kirk Bryan, a geologist in the Water Resources Division of the U.S. Geological Survey, in cooperation with the Arizona State Agricultural Experiment Station. The purpose of the study was to determine the possibility of developing groundwater supplies where there was arable land but no surface water.[8] Bryan, together with G. E. P. Smith and Gerald A. Waring of the University of Arizona, followed up this study with a more comprehensive investigation of groundwater and irrigation in the San Pedro Valley in 1934, but their rough manuscript was never published.[9]

Despite the multitude of groundwater studies of southern Arizona in the early decades of the 20th century, the need for factual information was still urgent. The United States Geological Survey opened its first office in Arizona in Tucson in July 1939 with the financial cooperation of the State of Arizona Water Commissioner. The early published investigations of the Geological Survey centered on the most heavily populated areas of the state -- Graham, Greenlee, Pinal, Maricopa, Pima, and Santa Cruz counties.[10] The hydrology and chemical quality of groundwater in the Upper San Pedro Valley received general treatment in an unpublished U.S.G.S. open-file report completed in 1952.[11] The first scientific

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in the San Simon Valley, Arizona and New Mexico," *U.S.G.S. Water Supply Paper 425-A (Washington: Government Printing Office, 1919).*

[8]Kirk Bryan, "The San Pedro Valley, Arizona and the Geographic Cycle," *Geological Society of America Bulletin No. 57 (1926).*

[9]Kirk Bryan, G. E. P. Smith, and Gerald A. Waring, "Groundwater Supplies and Irrigation in San Pedro Valley, Arizona" (typescript held at U.S.G.S. Office, Tucson, 1934).

[10]S. F. Turner and L. C. Halpenny, "Arizona", in *U.S.G.S. Water Supply Paper No. 911 (Washington: Government Printing Office, 1941).*

[11]L. A. Heindl, "Upper San Pedro Basin, Cochise County," in L. C. Halpenny, et. al. *Groundwater in the Gila River Basin and Adjacent Areas, Arizona -- A Summary* (Tucson: U.S.G.S. unpublished open-file report, 1952).

investigation of groundwater resources within the boundaries of the Fort Huachuca Military Reservation appears to have been a reconnaissance performed by Samuel F. Turner and E. M. Cushing of the U.S.G.S. in 1942 at the request of the Quartermaster Corps of the War Department. This brief report never received general circulation.[12] The first published hydrological study of groundwater resources underlying Fort Huachuca was made in 1966 by four hydrographers of the USGS in cooperation with the U.S. Electronic Proving Ground.[13]

Groundwater hydrology in the 1920s was still an undeveloped branch of science. Its practitioners, led by Oscar Meinzer, chief of the U.S. Geological Survey, were struggling in the twenties just to agree upon precise definitions and get a consistent professional vocabulary to describe their work. During the decade, Meinzer produced a series of technical pamphlets on groundwater (its occurrence, movement, origins, discharge, quantity, quality, and provinces), well field permeability, and how to recover and use groundwater resources.[14]

Besides the limited scientific knowledge about the behavior and extent of underground aquifers, another factor inhibiting early development of

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[12]S.F. Turner and E. M. Cushing, "Groundwater Supplies in the Fort Huachuca Area, Cochise and Santa Cruz Counties, Arizona," ca. December 1942. RG 112, Box 751. Geographical Series, 633.-720, Fort Huachuca. 02-0015.

[13]S. G. Brown, E. S. Davidson, L. R. Kister, and B. W. Thomsen, "Water Resources of Fort Huachuca Military Reservation, Southeastern Arizona," *Geological Survey Water Supply Paper 1891-D (Washington: GPO, 1966).*

[14]Oscar E. Meinzer, "Outline of Groundwater Hydrology with Definitions," USGS Water Supply Paper No. 494 (Washington: Government Printing Office, 1923), p. 3; Meinzer, "The Occurrence of Groundwater in the United States with a Discussion of Principles," USGS Water Supply Paper No. 489 (Washington: Government Printing Office, 1923); Meinzer, "Outline of Methods for Estimating Groundwater Supplies" USGS Water Supply Paper No. 638-C (Washington: Government Printing Office, 1932).

deep wells in the arid region was the lack of a reliable technology to bring water to the surface in a large enough quantity for irrigation or municipal purposes. Among the technological problems to be solved were the need to invent a pump to pull large volumes of water from relatively deep wells, development of suitable and cheap power plants, and new techniques in well-water drilling to provide for relatively large diameter deep wells. Throughout the 1890s and the first decade of the 20th century, farmers attempted to adapt the windmill to irrigation. Some farmers in the western states utilized water wheels, but little pumping was done by steam or gasoline. Groundwater in San Pedro Valley was first tapped by isolated farmers and ranchers using windmill powered pumps to irrigate a few acres or to provide stock water and as late as 1934 wells dug for these purposes were almost all pumped using windmill power.[15] These farms and ranches were located mostly near the rivers where water underlies the soil at shallower depths. In the Elgin District on the Babacomari River water was obtained at a depth of 10 to 50 feet in drilled wells equipped with windmills. Windmills were cheap, cost little to operate, and had a limitless source of power, but they had an effective lift of only about 70 to 80 feet and they could not produce enough water to irrigate more than a few acres or provide for more than a handful of households. By the 1930s several ranchers at the base of the Mustang and Whetstone Mountains, in Vaughn Canyon and Main Valley had drilled to a depth of 200 to 300 feet in an attempt to obtain non-failing supplies of water but the results were generally unsatisfactory.[16]

By 1900 a greatly improved model of a Centrifugal pump, patented in England in 1875, became widely available in the United States. This type

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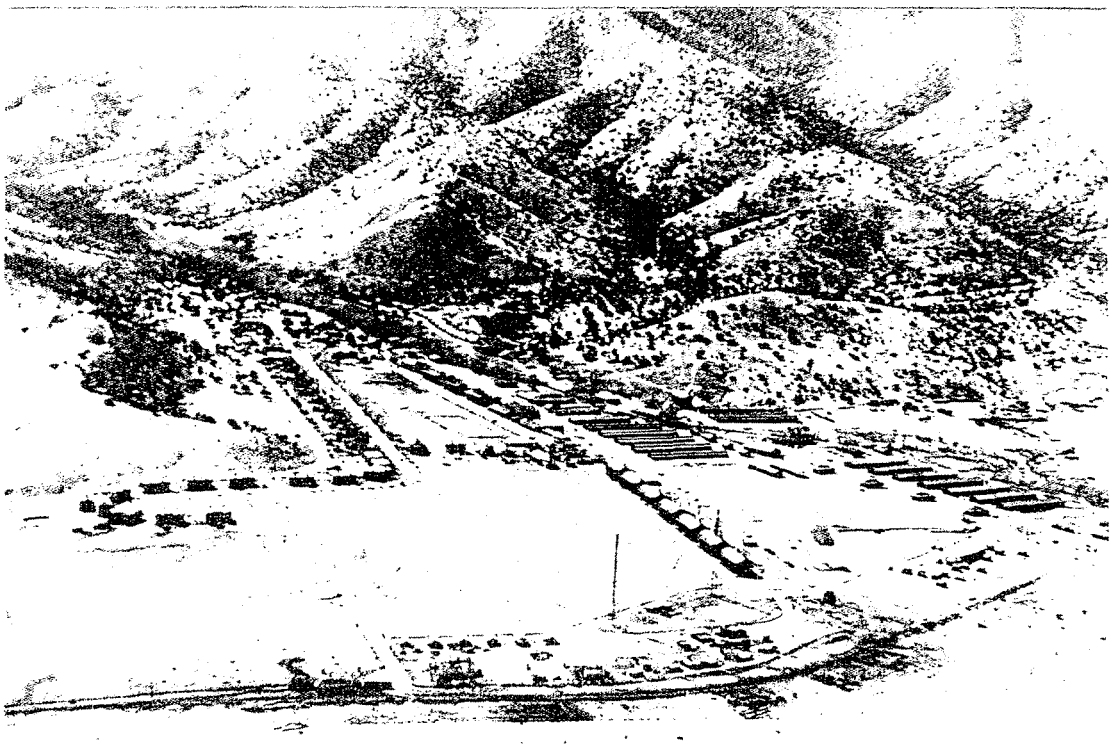
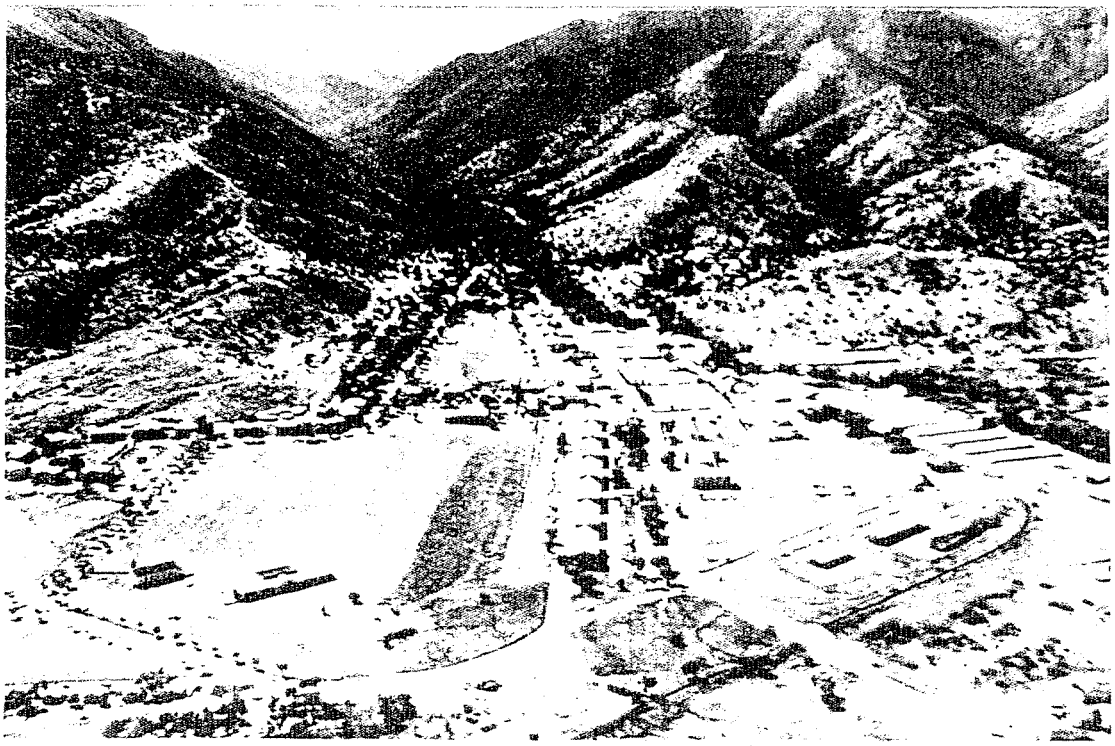
[15]Bryan, 1934, p. 84.

[16]Bryan, 1934, pp. 131-34; Herbert M. Wilson, "Pumping Water for Irrigation," *USGS Water Supply and Irrigation Papers No. 1* (Washington: GPO, 1896); Donald E. Green, *Land of the Underground Rain: Irrigation on the Texas High Plains, 1910-1970* (*Austin: University of Texas Press, 1973), pp. 38-43.*



Aerial view, Fort Huachuca, ca. 1929. Radio tower in foreground.



Aerial view, Fort Huachuca, ca. 1935

of pump had a larger diameter than a piston pump and was capable of delivering a large volume of water -- several hundred gallons a minute. The early centrifugal pumps could only suck water from a depth of about 20 to 30 feet. Because a large-diameter pit had to be dug down to the water level in order to use the centrifugal pump, it did not meet the needs of water seekers except in areas of shallow ground water, such as river valleys.[17]

Suitable pit-less pumps, rotary drilling rigs, and oil engines became available by 1910. During the 1920s several manufacturers made breakthroughs in pump technology that made pumps less expensive, more reliable, and more efficient. One of the major improvements for deep well drilling was the decrease in the diameter of bowls in pit-less centrifugal pumps to 12 inches or smaller. This was made possible by the development of gasoline and electric motors that increased the revolutions per minute of engines driving the pumps and by modifications in the impeller, lubrication, and bearing systems. Smaller diameter wells and casings made well drilling less expensive, while smaller pumps revolving at higher speeds, pumped larger volumes of water.[18] By the 1930s when Fort Huachuca installed its first successful wells, they were developed with deep-well turbine pumps driven by high speed gasoline, and later electric, motors.

Methods of well-drilling also greatly improved in the early decades of the 20th century by experience gained in sinking oil and gas wells to greater depths. Such drilling resulted in development of smaller, and more efficient drilling tools. In the 19th and early years of the 20th century drillers tended to be local men, who depended on their own ingenuity. In 1915 the first association of private well drillers was formed in North

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[17]E. W. Bennison, Ground Water: Its Development, Uses, and Conservation (St. Paul , Minnesota: Edward E, Johnson, 1947), pp. 197.

[18]Everett W. Lundy, *A History of the Deep Well Turbine Pump Industry*, (Los Angeles, 1968); Bryan, 1934, pp. 86-88.

Dakota and soon thereafter 15 other state or regional associations of water-well drillers were organized. Finally, in 1929 the American Association of Water Well Drillers was formed. The organization worked closely with federal and state geological surveys, public health departments, and universities.[19]

The continuing improvement of Fort Huachuca as a permanent, modern garrison with training complexes, recreational amenities, residences for families of military personnel, and fuller community support facilities created an escalating demand for more and better quality water that required competent long-range planning on the part of the post's water works engineer -- the post quartermaster. Although the army had struggled for more than 50 years to supplement its water supply by making fuller utilization of the existing springs on the military reservation, the area's abundant groundwater potential had barely been explored. Development of underground water supplies in the 1930s and 1940s was to make the post immune from cyclical drought for the first time since its founding in 1877. The army had explored for ground water near the mouth of Huachuca and Garden canyons in 1912 and developed a largely unsuccessful well in the latter canyon at that time. In 1930 G. H. Huddleson, the post quartermaster, made a second effort to sink a well in Garden Canyon. Its limited production, however, led the army to search elsewhere for water and in 1936 they discovered a magnificently productive well field near the eastern boundary of the military reservation.

The Garden Canyon Well Site: 1930-1936.

Lt. Col. Huddleson received instructions from the Quartermaster General in Washington D. C. through Circular Letter # 96 O.Q.M.G. dated November 27, 1929 to search for a source of underground water on the military

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[19]Bowman, 1911, p. 25; Oscar Meinzer, "Groundwater in the United States," U.S.G.S. Water Supply Paper No. 836-D (Washington: Government Printing Office, 1939), p. 197.

reservation to augment the post water supply, but perhaps more importantly to ensure a more reliable source during seasons of drought. The army contracted with Haney & Runte of Warren, Arizona to drill the wells and Lane & Flick of Bisbee, Arizona to clean, case and cap them. The $2,000.00 contract provided that the contractors would drill one or two wells on the military reservation, the first at the entrance to Garden Canyon and a second one, if possible, at the entrance to Huachuca Canyon. Drilling commenced on June 16, 1930 on a flat located near the wagon road at the mouth of Garden Canyon above the 5,050' contour and within 3000 feet of the existing water line to the old post. Heavy rains in July and August delayed the work of the contractors. When work finally got underway, the drillers encountered very hard granite at 106 feet requiring substitution of a heavier churn-type drilling rig to complete the job. On September 11th, the contractors reached a depth of 200 feet and were ordered by the military authorities to cease drilling and move their rig to the second proposed well site in Huachuca Canyon. The contractors placed a ten inch guide casing in the well down to 60 feet and installed inside this an eight inch standard well casing down to 152 feet. Water stood in the well at a depth varying from 7 to 20 feet; tests indicated that the well had a capacity of about 200,000 g.p.d. The Garden Canyon well was then capped and no pumping equipment was installed until 1934. Drilling, testing, and capping the well had cost the army $2,021.17 leaving no unexpended balance to carry forward the proposed drilling work on the second well in Huachuca Canyon.[20]

From 1913 through 1927 the 10th Cavalry occupied Fort Huachuca. In March 1928, the 3rd Battalion and Headquarters and Service Company of the

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[20]Major. G. H. Huddleson, "Water Supply System: Fort Huachuca, January 22, 1930," Q.M.C. Form No. 93. VIII Corps Area: Quartermaster Post Planning, 1905-1941. RG 394, Box 22, Entry 266. 02-0003; Lt. Col. G. H. Huddleson, Q.M. Corps, "Fort Huachuca Arizona: Completion Report - Garden Canyon Well," February 1, 1932 Construction Completion Reports, 1917-1943. RG 77, Box 132. WNRC, Suitland. 02-0012.

25th Infantry joined the 10th Cavalry, until the cavalry troops were dispersed in 1931. The only black regiment to retain a combat training role during the 1930s was the 25th Infantry, stationed at Fort Huachuca. The other black regiments, the 9th and 10th Cavalry and the 24th Infantry, were relegated to support rather than combat training roles. In January 1933 the 1st and 2nd Battalion, 25th Infantry, with their Headquarters and Service companies moved from their border patrol camps at Nogales and Douglas to Fort Huachuca. Shortly thereafter, the 1st Battalion was deactivated and its personnel transferred to other units within the regiment. The whole 25th Infantry, comprised entirely of black troops, was now concentrated at Fort Huachuca. Until the coming of World War II, the 25th Infantry had an exclusive occupancy similar to the earlier stay of the 10th Cavalry.[21]

The most significant new construction associated with this consolidation of troops was the need for N.C.O. housing. In 1933-34 the army built 39 new N.C.O. residential units at the post. At the same time the quartermaster improved the post recreational facilities by constructing a theater and a second swimming pool for officers behind the Service Road and the Grierson Avenue officers' residences. He also expended a considerable amount of money on public works improvements such as roads, sewage treatment, and the water system.[22]

After the consolidation of the 25th Infantry in 1933, troops garrisoned at Fort Huachuca continued to train for a combat role, but officers also served as instructors in various civilian military preparedness programs conducted by the War Department in the inter-war years. Officers at Fort Huachuca trained reserve officers of the 409th and 410th Infantry

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[21]Gerald W. Patton, War and Race: The Black Officer in the American Military, 1915-1941, (Westport, Conn.: Greenwood Press, 1981), pp. 159-162.]

[22]Smith, p. 243.

Organized Reserve in Arizona. This program helped officers maintain their commissions during peacetime through training, school, and extension courses, and by performing brief tours of active duty. The Arizona National Guard made use of Fort Huachuca's rifle range as a summer training site on many occasions. The 25th Infantry also assisted in training young men who had volunteered for the Army's Citizen's Military Training Camp (CMTC) program. CMTC was a modest alternative to the system of universal military training rejected by Congress and the American people in the aftermath of World War I. The program required its volunteers to attend 30 days of military training each year in training camps. Those who completed four years of CMTC training became eligible for reserve commissions. The CMTC had a facility on the flatlands just north of Huachuca City. The army erected three 16-man CMTC lavatories in 1934 and constructed a headquarters building and recreation hall at the camp in 1939.[23]

A large number of private citizens worked on the post during the years of the Great Depression as laborers on a wide range of public works projects under the auspices of the Works Progress Administration (WPA). Beginning in July 1934 a handful of WPA workers secured from the Bisbee Employment Office arrived at the post to begin work rehabilitating buildings, digging ditches, and constructing a variety of stone masonry structures all over the post under the direction of Major S. J. Raymond, the post quartermaster. The program grew steadily until April 1936 when it peaked with the employment of 358 men; an additional 257 non-WPA laborers were placed on the quartermaster's payroll in May 1936, bringing the total civilian relief employment to 615 persons.

In 1933 Congress had passed another depression relief act that put large numbers of jobless young men into reforestation and other reclamation work under the Civilian Conservation Corps (CCC). President Roosevelt directed the Army to mobilize these men and thereafter to run their camps without making the program a military conscription project in disguise.

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[23]Matloff, 1969, p. 412; Phoenix Gazette, November 11, 1940.

The army established a CCC camp near Fort Huachuca. In 1935 the army decided to improve these camp accommodations so that a summer training school could be established for students enrolled in military accessory schools in Arizona, New Mexico, and Texas. The CCC camp at Fort Huachuca was constructed in 1935 and consisted of 13 forty-five man tent barracks with concrete foundations, one five-man officers quarters, a kitchen and mess hall facility, a ten bed infirmary, two storehouses, and a bath house and latrine complex with suitable sewer lines and a septic tank. The CCC transferred all these buildings to the War Department in December 1939 in support of the emergency troop mobilization.[24]

Since 1930, when the first Garden Canyon well was drilled, through 1933, the springs had apparently supplied a sufficient amount of water to the post reservoir to meet the garrison's needs although at times (such as the summer of 1933) the post commander had imposed water conservation measures to reduce consumption to a minimum. The expansion of post population during the Great Depression coincided with a prolonged dry cycle throughout the Southwest and the Great Plains regions and caused severe water shortages for the post after 1933. The winter of 1933-34 was exceedingly dry with no snow whatsoever falling in the mountains feeding the springs at Fort Huachuca. As early as February, army officials realized that in this exceedingly dry season the water supply from the springs would soon become insufficient to supply the fort. The specter of a severe water shortage caused the post commander to issue an early water conservation order:

HEADQUARTERS FORT HUACHUCA
Fort Huachuca, Arizona

February 16, 1934

MEMORANDUM

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[24]Smith, pp. 243-45; Record Cards for Descriptions of Post Buildings and Facilities in Series 393, 1922-1941: Fort Huachuca. RG 77, Entry 392, Box 3. 02-0043; "Work Progress Administration (WPA) Additions and Upgrades, 1934-1939," Post Museum Narrative History, n.d., n.p.]

No. 11. SHORTAGE OF WATER

1. Attention is directed to the existing shortage of water. Until the water supply improves, the restrictions imposed last Spring are renewed. They are as follows:

No irrigation of gardens or lawns, except between 6:00 P.M. and 9:00 P.M.

No irrigation of any sort when the red light shows on the flag-pole.

As an assistance to house-holders who cannot see the flag-pole, sentries are ordered to turn off all irrigating water when the red light burns.

2. For the guidance of all concerned in the use of water it should be noted that there are now over one hundred families and over seven hundred work-men on the post in excess of the population during the last water shortage.

By order of Colonel Knox.

Morgan E. Jones
Captain, 25th Infantry
Adjutant.[25]

On the same day that Colonel Knox issued his water conservation order, draftsmen from the Constructing Quartermasters Office began sketching a layout for the Garden Canyon pumping plant.[26] The plant, noted constructing quartermaster, Captain Joseph W. Timmons, was only to provide supplemental water for the existing Garden Canyon facilities and its equipment would be operated "only when the springs fail to deliver the minimum amount of water required." As originally planned in 1930, the plant was to contain a diesel-powered engine with an old plunger type pump. After re-

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[25]Fort Huachuca History Binder, 1934 [2], Fort Huachuca Post Museum. 10-0048.

[26]The well had never yet been used. After months of prolonged drought, the well was uncapped in February 1934 and water was found standing to a depth of 11 feet. Bryan, 1934, p. 138.

viewing the plans, the 8th Corps Area engineers decided to upgrade the design to utilize a more efficient gasoline engine and a modern centrifugal type pump. Once specifications were re-written, the quartermasters office circulated proposals for materials and work began in April on construction of the derrick, a 24,000 gallon concrete settling tank, and the 900 foot long eight inch diameter pipeline to connect the well to the main Garden Canyon conduit.[27]

While work was underway on the Garden Canyon pumping plant, drought conditions worsened at the post forcing Lieutenant Colonel Thomlinson to order stricter conservation measures:

HEADQUARTERS FORT HUACHUCA

Fort Huachuca, Arizona
April 26, 1934

MEMORANDUM
No. 49.

WATER

1. All sprinkling of lawns, washing of cars and watering of gardens on the post will be discontinued at once until further notice.

2. All leaky valves or water pipes will be reported to the Quartermaster immediately by any person detecting same.

3. The sprinkling of plants to keep them alive by using hand sprinkling pots is permitted.

By order of Lieutenant Colonel Thomlinson.

Morgan E. Jones
Captain, 25th Infantry
Adjutant.

The order of April 26, 1934 was temporarily rescinded on May 2nd and reim-

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[27]Capt. Joseph W. Timmons, Jr., Q.M. Corps, "Completion Report - Well Pump and Surface Booster Pump Installation," August 1934. Construction Completion Reports, 1917-1943. RG 77, Box 132. WNRC, Suitland. 02-0012.

posed 10 days later. The summer of 1934 proved extremely dry, one of the severest known up to that time. Some restrictions on watering lawns and gardens remained in effect that year through October.[28] In May and June, the army hurried construction forward on the new well. By early June, the Pratt-Gilbert Hardware Company of Phoenix had installed a Byron Jackson two-stage centrifugal pump driven by a 21 horsepower, 2300 r.p.m., Waukesha Motor Company gasoline engine at the Garden Canyon well site. The plant, which used a belt-drive system to connect the engine with the pump instead of the more efficient direct drive, had a rated capacity of 170 g.p.m. It was operational by the mid-June. The well never performed up to its rated capacity and according to reminiscences of Lieut. Col. Matthew H. Tomlinson, who was post commander for a short period in the 1930s, the Garden Canyon well never proved successful in curbing drought-induced water shortages.[29] After three years of operating the well, the post quartermaster's reports filed with the War Department indicated that the capacity of the Garden Canyon well had been revised downward to 100 gallons per minute.[30]

Although the Garden Canyon pumping plant may have eased some of the most Draconian conservation policies of the past, continuation of below normal precipitation patterns in 1935 demonstrated that the Garden Canyon well itself would not produce sufficient water to make the post immune

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[28]Fort Huachuca History Binder, 1934 [2], Fort Huachuca Post Museum. 10-0049, 10-0050, 10-0051, 10-0053.

[29]Post Museum Narrative History, "World War I and After, 1918-33," n.p.

[30]Capt. Joseph W. Timmons, Jr., Q.M. Corps, "Completion Report - Well Pump and Surface Booster Pump Installation," August 1934. Construction Completion Reports, 1917-1943. RG 77, Box 132. WNRC, Suitland. 02-0012; "Fort Huachuca Water Pumping Plants, January 18, 1938." Historic Records of Buildings, 1905-42, Forth Huachuca, AZ. RG 77, Box 94, Entry 393. File 50F7. 02-0006.

from drought. As reported in the mid-1920s the average daily consumption of water at the post was about 300,000 gallons. Because the post had grown in size and capacity to house military personnel and their families, and with the introduction of several hundred civilian laborers under the CCC and WPA emergency relief programs of the Depression Era, average consumption by the mid-1930s must have been substantially higher. The Garden Canyon pumping plant had a capacity to deliver only 144,000 g.p.d. if operated at its maximum capacity continuously over a 24 hour period. In the midst of a dry period on May 28, 1935 water shortages in the post reservoirs caused post commander, Colonel John F. Franklin, to impose moderate restrictions on watering lawns and gardens. He divided the post into southern and northern portions. Residents in each area were restricted to watering on alternate days of the week with no watering allowed on Sunday. As conditions worsened that summer, conservation measures intensified. The post was ultimately divided into three regions with watering permitted only two days in each section.[31]

Discovery of the East Gate Well Field:

The discovery of the well field that would become the post's major water source for the rest of the century was not made through any careful reconnaissance of the groundwater resources of the region. A modest increase in the use of groundwater during the 1920s throughout Arizona had been followed during the early 1930s by a spurt in drilling and broader utilization of underground water supplies. However, little was known in the 1930s about the occurrence, distribution, or movement of groundwater in the San Pedro Basin. Other than Kirk Bryan and G. E. P. Smith's general survey of the San Pedro Valley in 1934, there had been no careful scientif-

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[31] Memorandum No. 104, May 28, 1935. 10-0056; Memorandum No. 111, June 7, 1935. 10-0057. (Fort Huachuca History Binders, 1934-35 (1), Fort Huachuca Post Museum.)

ic investigations of groundwater supplies by the USGS or the War Department. There is no record of any test wells being put down by the army prior to drilling the first well on the upper piedmont near the east boundary of the military reservation. The best indicator of where groundwater might be found could be obtained from records of other deep wells in the region. At and near the village of Garden Canyon, just east of the military reservation, several wells had been dug, but they were drilled to obtain small water supplies from the beds of marshes. Owners of summer cottages in Ramsey Canyon were all supplied from shallow wells high up in the canyon. In the mid-1930s there was only one deep well in the vicinity of present day Sierra Vista and that was at the Oliver Fry Ranch, located at Garden Canyon on the upper part of the pediment near Huachuca Mountain. Fry, who had come to the region in 1912, had drilled a well to a total depth of 500 feet; water stood in the well at about the 460 foot level and supplied water to a number of nearby houses. To the east approaching the San Pedro River where the depth to groundwater was shallower, there were several wells.[32]

With the history of well production at the Fry Ranch, the existence of groundwater along the eastern boundary of the fort could hardly have surprized the army. However, the richness of the discovery seemed to take

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[32]Bryan, 1934, pp. 139 and 165. Fry's well was considered of good quality with a low content of mineral matter in solution. Calcium carbonate was the principal dissolved mineral and the well contained minor amounts of sodium and sulphate and no fluoride. Turner & Cushing in 1942 reported on wells operated by windmill powered pumps on alluvial fill surrounding the Huachuca Mountains. These windmills had discharge capacities varying from 1 to 10 g.p.m. and provided water chiefly for domestic or stock uses. In the Elgin area, on the upper Babacomari River, shallow wells extended down into the first water bearing strata and ranchers experienced wide seasonal fluctuations in supply. However, one an irrigation well drilled on a ranch north of Elgin produced 1,000 g.p.m. They reported only a few wells south and east of Garden Creek between the mountains and the San Pedro River which were only drilled to the first waterbearing strata yielding a supply sufficient to meet the need of ranchers. No deep wells existed in this region. Northeast of the Fort, wells were deeper than in Elgin or southeast of the reservation. Turner & Cushing, ca. 1942: 5-6.

army officials by surprise. In 1936 the army decided to use WPA labor to build a new provost station house and to clear several acres of nearby land for an emergency landing field within the military reservation near the central part of the eastern boundary where the Southern Pacific Railroad and the highway entered the reservation. The purpose of the guard house was threefold: 1) to control access to the military reservation from communities lying to the east; 2) to provide a detention cell where "suspicious characters may be held for investigation," and, 3) to furnish storage space for supplies needed for airplane service. The army also desired to provide airplane landing lanes on the military reservation, in part as a convenience to aviators, but primarily for training exercises involving the coordination of airplane reconnaissance work and infantry maneuvers. These contemplated improvements along the eastern boundary were some four miles distant from the tight cluster of buildings that housed the post garrison. If this outpost on the eastern border of the fort was to be occupied, drilling a well to supply water to the provost guardhouse and airfield would be necessary.

The local quartermasters office designed a small pump house and a suitable water pressure system to meet the needs of the guardhouse and landing field with the assistance of the Quartermaster General's Office in Washington, D.C. Since the army did not have the special equipment required to actually drill the well, it entered into a contract with Lane & Flick, a local well drilling firm from Bisbee, Arizona. All other work was performed by station labor and WPA crews under the supervision of the constructing quartermaster.

The original contract, signed April 13, 1936, provided that the contractor would drill and case a six inch diameter well to a depth of 350 feet for a price of $1688.36. The site chosen for drilling was located approximately 290 feet west of the East (Fry) Gate of the military reservation. The drilling team encountered few difficulties, but at 350 feet they still had not reached the zone of saturation. The army amended its contract with Lane & Flick on May 11th to increase the depth of the well to 620 feet at a cost of $4.83 per lineal foot and to replace 60.42 feet of six inch casing with eight inch casing. At a depth of 500 feet the drill-

ers encountered water bearing sand that supplied good, potable water in quantities greater than the capacity of any test pump that could be used in this well. On July 10th the army brought the well at the eastern entrance into production. Drilling records suggested that for perhaps two to three months during the rainy season ground water would exist to a depth of 85 feet. Permanent water was found at 470 feet down to bedrock at 620 feet below the surface. Once the drilling was completed, the post quartermaster department erected a stone masonry structure measuring 14' x 28' immediately over the well casing (Building No. ~~13130)~~ to provide space and shelter for the power unit, pumping equipment, and water pressure system.[33]

Development of the East Gate Well Fields.

Major S. J. Raymond, the post quartermaster who supervised all WPA construction at Fort Huachuca, is credited with first having perceived the potential of the new well field at the east gate as a possible way to ease the chronic domestic water shortages in the old post area. In the fall of 1936 he wrote:

> This last feature [fire hazard] has been a problem at this post in recent years as the demand for domestic water supply has constantly increased with no assistance from nature in the furnishing of additional water. A fire at the post in the dry season would prove a real calamity.

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[33]"Fort Huachuca Water Supply System, January 18, 1938." Historic Records of Buildings, 1905-42, Forth Huachuca, AZ. RG 77, Box 94, Entry 393. File 50F7. 02-0007; "Military Construction Line Item Data: Development of Spring Water Supply in Huachuca and Garden Canyons," September 15, 1966. pp. 4-5. Hayden 306:20. Arizona Collection, ASU. 20-0014; S. S. Headman, "Completion Report Cantonment Construction: Fort Huachuca, Arizona, May 10, 1941." Construction Completion Records, 1917-1943: Fort Huachuca-4. RG 77 Box 134, p. 21. 02-0013; Maj. S. J. Raymond, Constructing Quartermaster, "Completion Report: Emergency Landing Field," July 10, 1936. Construction Completion Reports, 1917-1943. Fort Huachuca-1. RG 77, Box 132. 02-0012.

> The problem of water supply seems to be finally solved in that a well drilled at the emergency landing field appears to have developed an enormous quantity of water that may easily be made available to the post requirements; this will be determined in the near future.[34]

When water was struck at the east gate, Raymond was in the second year of a projected four year post improvement program. During this time, he had aggressively pursued all WPA funds for post improvements projects. In 1937 he had an opportunity to receive an appropriation of $300,000 to $500,000 in WPA funds that had been allocated to other posts, but had not been used. The army planned to spend the money on a new hospital complex and housing facilities for 32 members of the Medical Corps and 20 enlisted men. Obtaining the development funds, however, hinged upon Raymond's ability to convince the General Staff and members of Congress that enough water was available to meet the post's future water needs. Major Raymond insisted that the underground water-bearing strata recently tapped at the airfield would provide ample water if developed by a 16 inch well drilled to a depth of 600 feet. He proposed to construct another reservoir on the hill overlooking the old post of sufficient capacity to store the flow from the well conducted through a four inch pipeline.[35]

In 1938 the War Department assigned Major J. L. Brooks, a member of the Army Quartermaster Corps since 1920, to Fort Huachuca with instructions to develop new sources of water. If no water supply could be found to meet the projected needs of the fort, the army was prepared to abandon it. Brooks first explored for more springs higher up in the Huachuca Mountains, but without any success. He next turned his attention to exploring the low lands along the eastern boundary of the reservation for groundwa-

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[34]Quoted in, Post Museum Narrative History, "Work Progress Administration (WPA) Additions and Upgrades, 1934-39," n.p.

[35]~~Folsom~~ Moore ~~to Dear Paul;~~ October 28, 1937. Hayden Collection 131:1, Arizona Collection, ASU. 20-0187; Bisbee Daily Review, August 28, 1937. 20-0185.7

ter. He drilled two test wells and discovered to his surprise "an enormous quantity of water" in the underground reservoir which was capable of meeting all the immediate and projected needs of the post.[36] On July 19, 1938 Major Brooks filed a report with the Quartermaster General proposing improvements including a new production well at the east gate to augment the present supply of the old post area. In September of that year Brooks installed a plunger type pump at the original east gate well site drilled two years earlier.[37]

The new well field near the east gate was further developed in 1939, wrote Major Brooks, "to supply additional water service for the benefit of the Government and the 25th Infantry" and "for the purpose of obtaining more water to eliminate restrictions and guarantee a sufficient quantity of water for sprinkling of lawns, irrigation of shrubbery, fire protection and other necessary uses." The army contracted with W. E. Lane of Bisbee, Arizona in the winter of 1938-39 to drill a 14-inch well (Well #1) on government-owned land within the Military Reservation at a location 300 feet west of the east boundary, or about 90 feet west of the first producing well. Drilling began on December 5, 1938. At 470 feet, the drill encountered water bearing gravel which continued without interruption for over 200 feet to a depth of about 680 feet. Here the drill struck a twenty foot thick layer of clay. At about 700 feet the drill encountered a rela-

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[36]228-01 Background Material File, Fort Huachuca Records, Fort Huachuca Post Museum, p. 373; Quoted in, Post Museum Narrative History, "Work Progress Administration (WPA) Additions and Upgrades, 1934-39," n.p.

[37]S. F. Turner and E. M. Cushing, "Ground Water Supplies in the Fort Huachuca Area, Cochise and Santa Cruz Counties, Arizona," in Annual Report of Medical Department Activities at Fort Huachuca, Arizona, February 10, 1942. World War II Administrative Records, 1940-1949. 319.1 Unit Annual Reports, Box 170. RG 112, Office of the Surgeon General, Army, p. 2. 02-0015; Maj. J. L. Brooks, QM Corps, Const. Quartermaster, "Completion Report of New Well # 4; Portion of O.P. 752-13-1," March 9, 1939. RG 77, Box 133. Construction Completion Reports, 1917-43. Fort Huachuca, vols. 1A-3. 02-0008.

tively impermeable rock surface and drilling was suspended on January 27, 1939.

Within a month, contractors completed the well casing and installed a Wintroath 12" turbine type, 22 stage pump and a 400 h.p. gasoline engine to test the well. After operating for four hours at an average of 1200 r.p.m., the engine became disabled and testing was delayed until electric power could be connected from a new 6600 volt transmission line. The contractors then brought in a 2300 volt, 150 h.p. induction motor from a Bisbee copper mine to replace the gasoline engine. However, the quantity of power required to run the pump exceeded the amount available from the post power plant during daytime hours, so testing proceeded slowly. Working at night, Lane's crew completed the tests on March 1, 1939. Tests showed that the well could deliver 710 g.p.m. with a 43 foot drawdown that came back to the original level within five minutes of the cessation of pumping. In order to test if a further quantity of water might be produced, the contractors attached a larger pulley and increased the speed of the motor to pump 875 g.p.m. The drawdown was 46 feet, but again when the pumps were tuned off, the water level rose within five minutes to the static water level. The results of this test, wrote Major Brooks in his report to the Quartermaster General, showed clearly that the draw down was a result of flow restrictions imposed by the perforations in the pipe, because the level of saturation outside the pipe was "scarcely altered in any degree whatever by these operations." Thus, he concluded, a greater quantity of water could be pumped from the well by increasing the number of perforations which had been made "on the basis that no greater quantity of water than five hundred (500) gallons per minute would be demanded by the Office of the Quartermaster General."[38]

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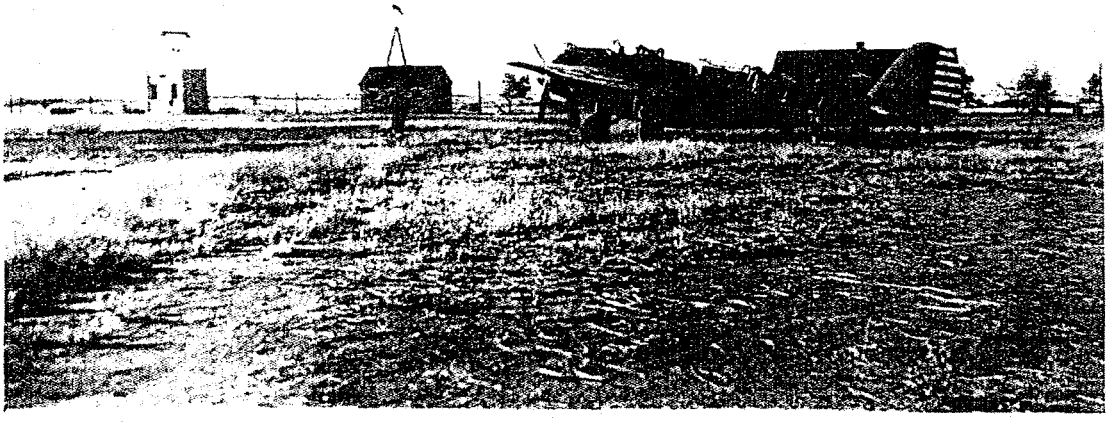
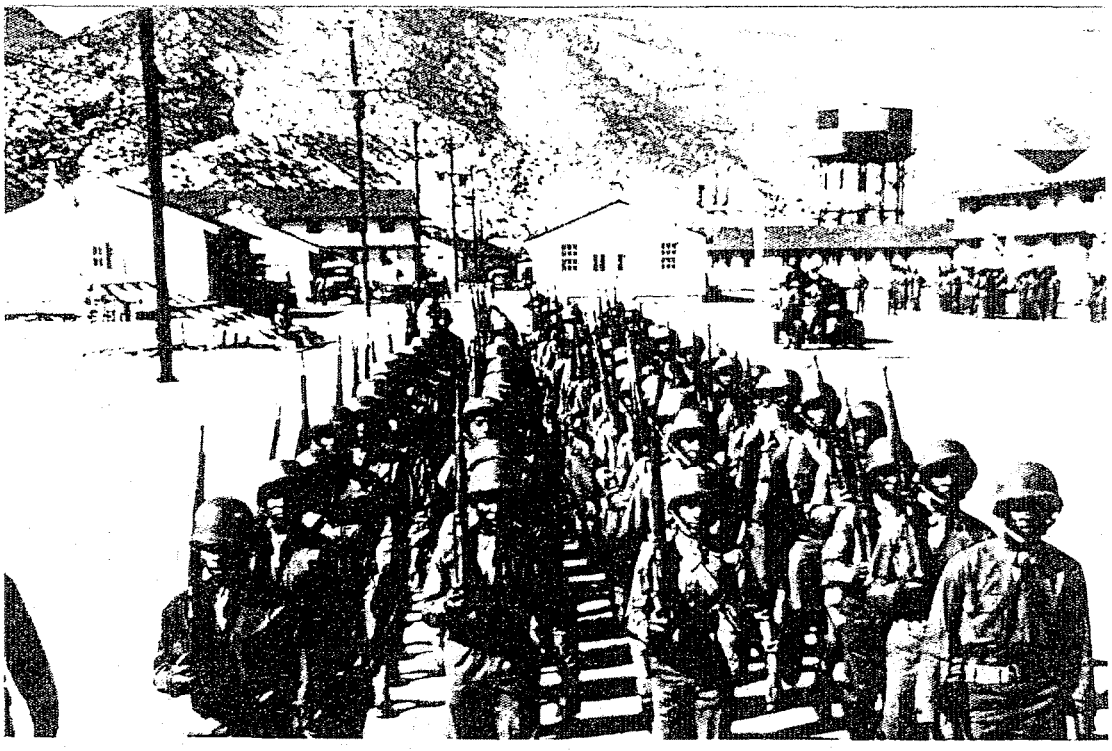
[38]Maj. J. L. Brooks, QM Corps, Const. Quartermaster, "Completion Report of New Well # 4; Portion of O.P. 752-13-1," March 9, 1939. RG 77, Box 133. Construction Completion Reports, 1917-43. Fort Huachuca, vols. 1A-3. 02-0008; Maj. J. L. Brooks, QM Corps, Const. Quartermaster, "Completion Report Pumping Equipment for Water Supply System. O.P. 752-13-1," December 16, 1939. RG 77, Box 133. Construction Completion



Aircraft at airstrip, Fort Huachuca, 1938. Well No. 1 is at left.



Troops in formation in cantonment area, 1942. Note water tank tower in background right.

Drilling and testing Well # 1 had cost the army a total of $8,455.00, but the new water source could not be put to beneficial use until the army installed turbine and a booster pumps and a water conduit to move the water from the distant well site to the post reservoirs. The booster pump was required because the water had to be lifted from the well field at elevation 4630 to the hilltop reservoirs at elevation 5270 feet. A 20,000 foot steel water conduit and a second 250,000 gallon concrete reservoir, located on the hilltop overlooking the old post just north of the 1884 double-basin reservoir, were completed by the summer of 1939. During June workmen operating under the supervision of Constructing Quartermaster Major J. L. Brooks and the two contractors, United Iron Works of Oakland, California (UIW) and W. E. Lane of Bisbee, Arizona, laid the foundations for the horizontal centrifugal (booster) pump and the deep-well turbine pump. Before the end of July, Lane had installed a Wintroath 21 stage, screw column deep well turbine pump pump with a 100 horsepower General Electric induction motor and was ready to test the equipment. Simultaneously, UIW oversaw installation of its Type MS 4 stage booster pump and a 3 phase 125 horsepower motor. The booster pump was connected to a 50,000 gallon surge tank and the 10 inch supply main leading to the new reservoir. By July 30th water from the booster pump was flowing into the reservoir at the rate of 532 g.p.m. and on August 1st it overflowed the new 250,000 gallon storage unit spilling into Soldier Ravine from the discharge tube at a rate of 100 g.p.m. The total cost for the pumping plant including equipment and installation was $10,386.65.[39]

Reports, 1917-43. Fort Huachuca, vols. 1A-3. 02-0009.

[39]S. F. Turner and E. M. Cushing, "Groundwater Supplies in the Fort Huachuca Area, Cochise and Santa Cruz Counties, Arizona," ca. December 1942. RG 112, Box 751. Geographical Series, 633.-720, Fort Huachuca. 02-0015; J. L. Brooks, QM Corps, Const. Quartermaster, "Completion Report Pumping Equipment for Water Supply System. O.P. 752-13-1," December 16, 1939. RG 77, Box 133. Construction Completion Reports, 1917-43. Fort Huachuca, vols. 1A-3, p. 2. 02-0009.

The Coming of World War II: Expansion of Fort Huachuca.

The German annexation of Austria in March 1938 followed by the Czech crisis in September of the same year awakened the United States and other democratic nations to the possibility of another world war. With war in Europe appearing inevitable, the army initiated a building expansion program at Fort Huachuca to provide for new trainees. As early as July 1938 ground was broken for the construction of the "Million Dollar Barracks," a barrack for enlisted men that dwarfed anything constructed on the post prior to this time.[40] After Germany seized Czechoslovakia in March 1939, Great Britain and France decided they must fight rather than yield to Hitler. In August Germany made a deal with the Soviet Union to partition Poland and Finland, then Hitler invaded Poland. France and Great Britain responded by declaring war on Germany. Although the American people wanted to remain out of the war if possible, President Roosevelt and his advisors, had already launched the nation on a preparedness campaign as early as the beginning of 1939.

Immediately after the European War started, the President proclaimed a limited national emergency and authorized increases in the Regular Army and National Guard enlisted strength to 227,000 and 235,000, respectively. The army concentrated on making its Regular force ready for emergency action by providing it with full and modern equipment as quickly as possible, and in April 1940 by engaging 70,000 troops in the first genuine corps and army training maneuvers in American military history. Fort Huachuca was to have a distinctive role as a mobilization and training center for black soldiers. The NAACP and several national leaders insisted that the best interests of a strong and unified America was to allow the full and equal participation of blacks in the mobilization effort. The military, reflective of the broader society, was not amenable to changing its

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[40] Fort Huachuca -- 1938 WPA Construction, Fort Huachuca History Binder, 1936-1941, Fort Huachuca Post Museum Library, 10-0057.

policy regarding participation of blacks. Regiments were to remain segregated, but the Roosevelt administration in October 1940 announced a plan for "fair and equitable" utilization of blacks in the military. The plan provided, in part, that blacks would be drafted in proportion to their population ratio -- about one to every eleven men. They were to be used in every branch of the service and black civilians were to have an equal chance with whites for jobs at arsenals and army posts. There were limitations. Black reserve officers were to serve in outfits that already had black officers. Black units would be officered by whites with the exception of the black National Guard Units.

In 1940, on the brink of World War II, there were only 4,179 black enlisted men and five black officers in the Regular Army. In the Army Reserve there were 353 black officers, less than one-half of one percent of the entire Officers' Reserve Corps. Fort Huachuca's military population in November 1940 stood at 1,300, but it would swell to over 6,000 in the ensuing months as the army completed the first phase of its cantonment construction program.[41]

After conducting site layout studies in early 1940, the army decided to locate its new personnel housing and cantonment on the sloping piedmont north of Soldier Creek. The area was midway between the old post and the new well fields near the eastern boundary of the military reservation. Colonel Joseph L. Brooks, constructing quartermaster, supervised the erection of the World War II cantonment area. Headman, Ferguson & Carollo, from Phoenix, served as consulting engineers, and the cantonment was constructed by Del E. Webb Construction Company of Phoenix, and White & Miller, Inc. of Tucson. The original cantonment project called for housing facilities for 5,240 enlisted men and officers. Fort Huachuca was still in an isolated area. Facility requirements for the construction organization alone required that a camp be erected. The camp had administrative build-

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[41]Matloff, 1969, pp. 415-422; Gerald W. Patton, ~~*War and Race: The Black Officer in the American Military, 1915-1941*~~ (Westport, Conn: Greenwood Press, 1981.), pp. 162-169; Phoenix Gazette, November 16, 1940.

ings for government officers, the architect-engineer, and construction "overhead personnel," a mess hall for 400 men and barracks for 250 men. Nine barracks in the cantonment (750 men), four company storehouses, an administrative building, and three mess halls were used initially for housing and caring for the construction crews.[42]

Up until this time, Fort Huachuca was served by its own utility service, but an outside electric power source was nearly within reach of the post by 1940. The army had been generating its own electric power from five small diesel engine-driven units. The closest main trunk natural gas pipeline was at Curtiss, 25 miles away, but the army had completed negotiations in 1940 on a contract to extend a line to the fort for heating and fuel purposes. The post sewer system consisted of two cess pools that frequently overflowed on the surface of the ground "causing a nuisance and a menace to health." As part of the cantonment project, the army constructed a sewage disposal plant. Water was supplied to the post by springs and a gravity flow system until just recently. Once Well #2 in the east gate field was completed, said S. S. Headman, consulting engineer on the construction project, the post would have sufficient water "to meet the needs of any size cantonment that might be considered." The cantonment area as designed by Headman and the post quartermaster in 1940 required construction of several new components to the water system including a new supply main and storage tank, a gridwork of distribution pipes, and a new production well (Well #2).[43]

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[42]S. S. Headman, "Completion Report Cantonment Construction: Fort Huachuca, Arizona, May 10, 1941." Construction Completion Records, 1917-1943: Fort Huachuca-4. RG 77 Box 134, p. 7. 02-0013.

[43]S. S. Headman, "Completion Report Cantonment Construction: Fort Huachuca, Arizona, May 10, 1941." Construction Completion Records, 1917-1943: Fort Huachuca-4. RG 77 Box 134, p. 7. 02-0013; *Phoenix Gazette*, November 11, 1940.

Cantonment Construction at Fort Huachuca, 1940-1941[44]

Number	*Building Description*	*Capacity*
80	barracks with lavatories	63 man
27	mess halls	170 man
27	day rooms	1 company
28	storehouse and company administration buildings	1 company
1	regiment administration building	(unknown)
5	officers quarters with mess	40 officers
2	officers mess halls	118 officers
17	service/support buildings	(various)
3	infirmary	3,000 man
1	nurses quarters	24 nurses
1	E. M. Mess	338 man
2	standard wards	33 man
4	combined standard wards	26 man
1	medical officer's quarters	17 officers
2	barracks	54 man
1	medical detention barracks	31 man
1	combined ward	25 man
7	medical support buildings	(various)
1	bakery	
1	cold storage plant	
1	ice plant	40 ton
2	laundry	
1	water tank	500,000 gallons
1	sewage treatment plant	
1	well	700 g.p.m.

As part of the World War II cantonment construction project, the army contracted to have a second 14 inch diameter well (Well #2) drilled in the vicinity of the east gate approximately 500 feet west of the well put in the previous year. This well was completed in November 1940 and was tied into both the old post water system and the new cantonment area in the spring of 1941.[45]

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[44]S. S. Headman, "Completion Report Cantonment Construction: Fort Huachuca, Arizona, May 10, 1941." Construction Completion Records, 1917-1943: Fort Huachuca-4. RG 77 Box 134, p. 7. 02-0013.

[45]S. F. Turner and E. M. Cushing, "Ground Water Supplies in the Fort Huachuca Area, Cochise and Santa Cruz Counties, Arizona," in Annual Report of Medical Department Activities at Fort Huachuca, Arizona, February 10,

Well #2 was drilled to a depth of 711 feet. The normal water level stood at a depth of 467 feet below the ground surface. The well tests indicated that the draw down on the water level was 23 feet and 46 feet by pumping at a rate of 500 g.p.m. and 937 g.p.m., respectively. However, neither draw down value created any change in the static water level in Well #1, 500 feet away, and the water level recovered to static level within nine minutes of the completion of the pumping tests. At Well #2 contractors installed an electrically-driven 22 stage Wintroath deep-well turbine pump with a 700 g.p.m. (at 520 feet) capacity. The two fourteen inch wells together delivered from 900 to 1,200 g.p.m.[46]

The army contracted for a second concrete "clear-well" and booster pump house with two pumps (one, a standby unit) in March 1941 to deliver water to the cantonment area. The two United Iron Works electrically-driven horizontal booster pumps had a capacity of 700 g.p.m. at 715 feet of head and 1080 g.p.m. at 270 feet of head. Near the well site, the army built a reinforced concrete ground storage reservoir with a capacity of 50,000 gallons.[47] The booster plant discharged water through a 12 inch cast iron line about 9,450 feet to a 500,000 gallon elevated steel storage tank (elevation 4800 feet) erected by the Allison Steel Manufacturing Company near the intersection of E Avenue and North Railroad Avenue in the cantonment area.[48] Wells #1 and #2 were interconnected with

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1942. World War II Administrative Records, 1940-1949. 319.1 Unit Annual Reports, Box 170. RG 112, Office of the Surgeon General, Army, p. 2. 02-0014.

[46]S. S. Headman, "Completion Report Cantonment Construction: Fort Huachuca, Arizona, May 10, 1941." Construction Completion Records, 1917-1943: Fort Huachuca-4. RG 77 Box 134, pp. 21-22. 02-0013.

[47]"Booster Pump House, May 10, 1941," OQMG Plan No. 6203-649, Building 255. Historic Records of Buildings, 1905-1942: Fort Huachuca. RG 77 Entry 393, Box 95. File: 10FS. 02-0046.

[48]"Water Tank, May 10, 1941," OQMG Plan No. 6203-1038, Building 260. Historic Records of Buildings, 1905-1942: Fort Huachuca. RG 77 Entry 393,

pipes and a control valve so that either deep-well pump could deliver to whatever reservoir was desired. The entire water distribution system within the cantonment area was laid with 12 inch pipe to provide adequate fire protection. The plan located 71 fire hydrants at 500 foot intervals so as to service every building in a block with two sources of fire protection.

As part of the 1941 water development, the army made many improvements to modernize the water utilities of the post. It built a sewage treatment plant complete with a digester and control house, a screen and grit chamber, sedimentation tanks, and pump and chemical houses. The army tried to improve the quality of the water delivered for domestic uses by contracting to have solution fed chlorination units installed on each of the water lines feeding the cantonment and old post. Water meters were also placed on the 12 inch line from the wells to the cantonment area, on the 10 inch line from the east well field to the old post, and on the 8 inch line from Garden Canyon to the old post.[49]

To summarize, by April 1941 the post water supply system consisted of water in the amount of 250,000 to 500,000 g.p.d. from springs and small collecting dams in Huachuca and Garden Canyons; 1,200 g.p.m. or 1,750,000 g.p.d. from two 14" diameter wells near the east gate of the reservation; 100,000 g.p.d. from a 6" diameter well near the east gate operated with with a plunger type pump; 50,000 g.p.d. by full-time pumping with an air lift pump from the old Garden Canyon Well; and the capacity to store water in two 250,000 gallon reservoirs on the hilltop overlooking the old post and one 500,000 gallon elevated steel tank in the cantonment area.[50]

Box 95. File: 60F6. 02-0047.

[49]S. S. Headman, "Completion Report Cantonment Construction: Fort Huachuca, Arizona, May 10, 1941." Construction Completion Records, 1917-1943: Fort Huachuca-4. RG 77 Box 134, pp. 21-26. 02-0013.

[50]The water level at the original east gate well was recorded as 459 feet in May 1936. By November 1940, it was 465 feet, a drop of 5.5 feet. Turner and Cushing noted in their 1942 study of groundwater resources at Fort Huachuca that the water level would drop fairly rapidly under heavy

In March 1941 cadres from the 3rd Battalion and heavy weapons company of the 25th Infantry were withdrawn to form and train the reactivated 368th Infantry at Fort Huachuca. These men were chosen because they had received the most effective combat training of all black units in the Army throughout the 1930s. On May 15, 1942, the 93rd Infantry Division was reactivated at Fort Huachuca, the first of two full strength divisions to train there in preparation for combat duty overseas. The 93rd Infantry was an all black division with white officers and comprised the 25th, 368th, and 369th Infantry Regiments, and the 593rd, 594th and 596th Field Artillery Battalions. The division adopted the insignia of the blue French Army helmet on a circular black field, symbolizing the division's attachment to the French Army in World War I.

In November 1942 the first Women's Army Auxiliary Corps (WAAC) officer reported for duty at Fort Huachuca, the first of some 180 WAAC's to serve beside the men of the 93rd Division. A new unit was prepared for the WAAC's including six barracks, two mess halls, a recreation area, and a large multipurpose administration building.

As mobilization continued through 1942, water requirements at Fort Huachuca began to reach the upper limits of the system's overall production capacity of 2,400,000 g.p.d. Early in 1942, the Quartermaster General of the U.S. Army requested assistance from the US Geological Survey to investigate and make recommendations on how to better utilize the groundwater resources of the military reservation. Samuel F. Turner and E. M. Cushing were dispatched to the fort and completed a review of the history of the existing water supply system, studied the geology and groundwater of the region, and made several recommendations to the army. First they concluded that the army should drill two additional wells to a depth of 700 to 1,000 feet, spaced at one-half mile intervals to the north of Wells

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pumping. If this drop became too great after several years of pumping, and a large supply was still needed, additional water would have to be developed in the limestones in the mountains or in Elgin or southeast of the post. Turner & Cushing, ca. 1942: 2, 5-6.

#1 and 2. Second, they advocated weekly monitoring of the production wells to measure fluctuations in the water table. Third, they told the army to clean out all springs, enlarge pipelines to carry maximum flows during the wet seasons, and utilize as much spring water as possible. Finally, they thought there was sufficient indication of water to justify development of a well in Garden Canyon in the vicinity of Mud Springs.[51]

The army acted immediately on the first recommendation by expanding its water production capability in the east gate well field. Before the end of 1942 the army had sunk three wells, Wells #3, 4, and 5, near the east boundary of the reservation and north of the existing wells. Each of the wells had a capacity of about 700 g.p.m. The wells were interconnected by a 16 inch pipe and two water mains of 12 inch diameter conveyed water from the wells to a second 500,000 gallon elevated steel tank and a 3,000,000 gallon ground level tank located in the Fort Huachuca housing area.[52]

The development was a timely one for, as shown in the accompanying table, by the end of 1942 the maximum daily water consumption at the fort was as high as 2,603,000 gallons outstripping the daily production capacity of the 1941 water system. Well Nos. 3, 4, and 5 added about 3,000,000 g.p.d. to the post water production capacity. In April 1943 the army decided to move selected military units from all over the United States to Fort Huachuca to form the 92nd Infantry Division and by May 11 the Infantry Division units were in place. They came from Fort Riley, Kansas; Camp Grant, Illinois; Camp Dodge, Iowa; Camp Sherman, Ohio; Camp Dix, New Jersey; Camp Upton, New York; and Camp Meade, Maryland. There were 26,294 enlisted men and 887 officers transferred. With the completion of the five east gate wells and the additional storage facilities Fort Huachuca had an ample water supply to meet this additional demand. By the summer of 1943

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[51]Turner and Cushing, ca. 1942, p. 6.

[52]US Army Engineers, Los Angeles District, *Report on Water Supply Fort Huachuca and Vicinity, Arizona.* June 29, 1974. Appendix 3-II.

daily maximum consumption reached as high as 3,500,000 g.p.m. and by the summer of the following year when the post population peaked at about 42,500 some 3,902,000 g.p.m. were required to support the needs of the post. Thus, consumption appears to have peaked at about 72% of the total system capacity.[53]

The average daily per capita water consumption as reported by the Post Medical Inspector varied from a low of 88 gallons per day per capita to a high of 284. However for most months, the daily average stood roughly between 110 and 140 gallons. This use was within the general limits found elsewhere in the state and nation. Nationally a survey of 10,000 communities that had public waterworks by the U.S. Census in 1930 showed that per capita consumption of water in these communities averaged as much as 125 gallons per day. In the Tucson urban area from 1950 to 1968 the average daily consumption was 160 g.p.d. The City of Phoenix reported a higher use in 1968 of about 225 g.p.d. per capita.[54] Capt. George H. Harmann, Jr., post medical inspector, reported in August 1943 that what he considered to be a high water consumption rate per capita at Fort Huachuca was due to the operation of three swimming pools of the fill and draw type that were drained and cleaned once each week. Poor plumbing maintenance also contributed to water loss through leakage in spigots, showers, dishwashing machines, and toilets.[55]

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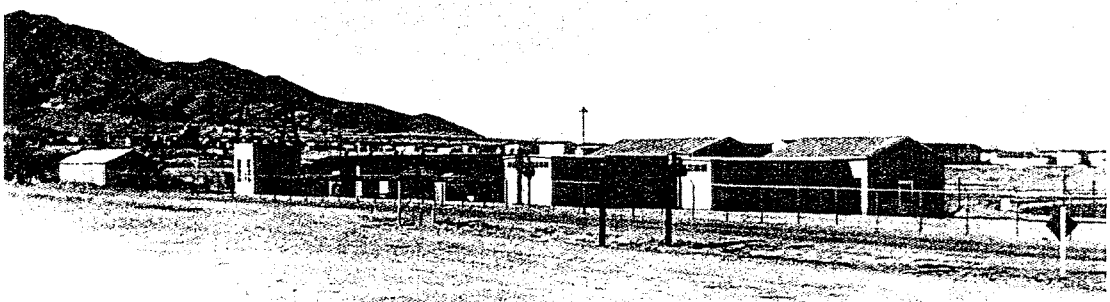
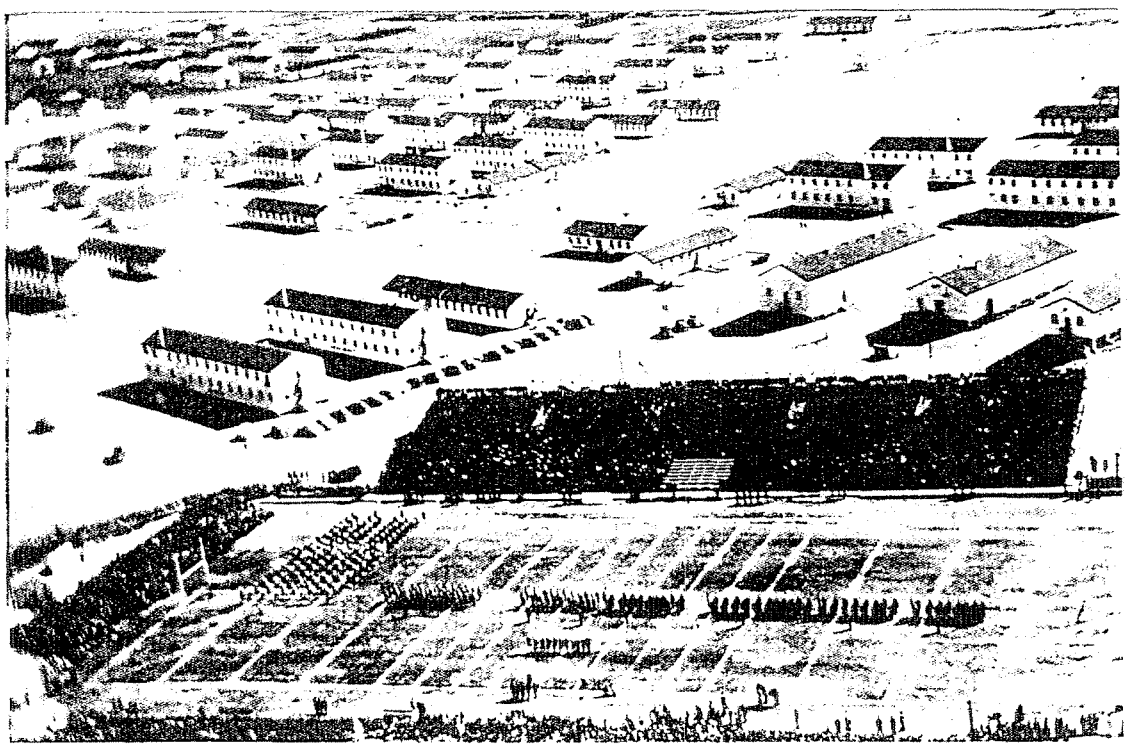
[53]"Military Construction Line Item Data: Development of Spring Water Supply in Huachuca and Garden Canyons," September 15, 1966. p. 4. Hayden 306:20. Arizona Collection, ASU. 20-0014.

[54]Faculty of the University of Arizona, Department of Hydrology and Water Resources, *Arizona: its People and Resources* (Tucson: University of Arizona Press, 1972), p. 112.

[55]Office of the Post Inspector, Monthly Sanitary Report; Fort Huachuca, Arizona, August 3, 1944. RG 112, Box 751, Geographic Series, 1943-1944, 721-5-1, p. 1. O2-0035.



Engineers compound, 1943. Pumphouse and water tower tank visible in background left.



Troops on parade, cantonment area, 1943.

Water Consumption, Fort Huachuca[56]
[in gallons per day]

Month	Year	Maximum	Minimum	Average	Ave/Capita	Sources
DEC	1942	2,603,000	1,119,000	2,124,500	103	Sp. & W1 thru 3
JAN	1943	2,126,900	n.a.	2,364,435	90	Sp. & W1 thru 4
FEB	1943					Sp. & W1 thru 3
MAR	1943					Sp. & W1 thru 4
APR	1943	2,554,000		1,681,000	141	Sp. & W1 thru 4
MAY	1943	2,989,000	1,441,000	2,322,000	103	Sp. & W1 thru 5*
JUN	1943	3,200,000	1,800,000	2,600,000	110	Sp. & W1 thru 5
JUL	1943	3,400,000	1,900,000	2,600,000	114	Sp. & W1 thru 5
AUG	1943	3,500,000	1,600,000	2,600,000	122	Sp. & W1 thru 5
SEP	1943	2,900,000	1,900,000	2,500,000	116	Sp. & W1 thru 5
OCT	1943	3,700,000	2,000,000	2,500,000	122	Sp. & W1 thru 5
NOV	1943	2,900,000	1,700,000	2,400,000	116	Sp. & W1 thru 5
DEC	1943	2,400,000	1,000,000	1,600,000	115	Sp. & W1 thru 5
JAN**	1944	2,702,000	608,000	1,815,000	88	Sp. & W1 thru 5
FEB	1944	1,312,073	637,073	883,553	144	Sp. & W1 thru 5
MAR	1944	1,612,503	651,503	922,903	138	Sp. & W1 thru 5
APR	1944	2,787,670	1,057,670	1,851,870	111	Sp. & W1 thru 5
MAY	1944	3,454,000	2,158,000	2,822,800	118	Sp. & W1 thru 5
JUN	1944	3,666,280	2,439,280	3,132,610	144	Sp. & W1 thru 5
JUL	1944	3,182,333	1,706,333	2,599,333	137	Sp. & W1 thru 5
AUG	1944	3,901,867	2,043,867	2,876,867	162	Sp. & W1 thru 5
SEP	1944	2,829,000	1,083,000	1,856,800	168	Sp. & W1 thru 5
OCT	1944	1,358,467	558,467	1,033,137	272	Sp. & W1 thru 5
NOV	1944	1,617,333	864,333	1,160,033	284	Sp. & W1 thru 5
DEC	1944	1,571,000	831,000	1,253,000	173***	Sp. & W1 thru 5

*Virtually the entire water supply was pumped from wells because continuing drought conditions reduced the flow from springs to a negligible amount.

**Beginning in January 1944 only daily averages are reported for spring production. Overall maximum and minimum consumption figures were computed by adding well production to average daily spring yield.

***Drop in per capita consumption explained by cold weather and repair of leaking fixtures.

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[56]Monthly Sanitary Reports of the Office of the Post Medical Inspector: Fort Huachuca, 1943-1944. Records of the Surgeon General's Office (Army). RG 112, Box 751 Geographic Series, 1943-1944 721.5.1. 02-0010 through 02-0040.

Training of both the 92nd and 93rd Infantry Divisions at Fort Huachuca was intense during 1942-1943 with as many as 32,000 troops from these regiments quartered at the fort's barracks.[57] The 92nd began "D" exercises in the countryside around the fort, and in January 1944 went to Louisiana for maneuvers. During 1944-1945, the 92nd Division, known as the Buffalo Division, fought in the European theater; the 93rd, the Blue Helmet Division, fought in the Pacific. In March 1944 the advanced echelon of the 93rd Division arrived at Guadalcanal in the Solomon Islands. Combat units were attached to the American Division at Bougainville in the Solomon Islands. Between April and October 1945 the division occupied Morotai.

In June 1944 the 370th RCT, 92nd Division left Fort Huachuca for duty in the European theater. The following month they were in combat duty in Italy. In February 1945 the 92nd Division attacked Monte Canale, near Massa, Italy and suffered heavy losses. In April 1945 elements of the division entered La Spezia and Genoa, as the conflict came to a close. The war over the 92nd Division left Europe sailing to the United States on November 16, 1945. On January 17, 1946 the 93rd Division sailed for home from the Philippines.[58]

Acquisition of the East Range.

Fort Huachuca's requirements as a training facility during WWII led to the acquisition of a large tract of land on the relatively flat piedmont to the northeast of the original post. During the war troops at Fort Huachuca used the area as a safe down-range for artillery training. This area, known as the Artillery Range (or as it is presently called, the East Range), was composed of tracts acquired from the Department of the Interior

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[57]Wayne E. Spangler, Fort Historian, "Short History of Fort Huachuca", typescript January 1959. Forth Huachuca History Binder, 1959-1962. Fort Huachuca Post Museum. 10-0126.

[58]Smith, 1978, pp. 308-309.

through Public Land Orders, land leased from the State of Arizona, and tracts acquired from private landholders. In all, the lands acquired after 1940 amounted to 31,741 acres.[59]

On March 14, 1942 the War Department Real Estate Division was authorized to acquire land for an extension to the military reservation, containing approximately 34,960 acres, adjacent to Fort Huachuca for use as a Field Artillery Range. Public Order No. 16 of the Department of the Interior, dated July 21, 1942, withdrew Tract A containing approximately 3,853.18 acres for use of the War Department as a Field Artillery Range. The PLO stated, "it is intended that the lands described herein shall be returned to the administration of the Department of the Interior when they are no longer needed for the purpose for which they are reserved."[60] The order was later limited to the "duration of the national emergency, plus six months" by Executive Order No. 9526, dated February 28, 1945, which ended October 28, 1952.[61]

Three Real Estate Directives (RE-D) in 1942 and 1943 governed acquisition of lands. RE-D 670, dated 14 March 1942, authorized fee acquisition of lands and other transfers for the Artillery Range. RE-D 670A, dated 21 August 1943 authorized fee acquisition of additional land for the Artillery Range, containing approximately 1,129.53 acres, in sections 27, 33, and portions 34 in T20S/R20E -- "Tract 63." RE-D 670B dated 7 September 1943 related to 670A, by amending acquisition of two parcels owned by the Bo-

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[59]South Pacific Division, "Real Estate, Fort Huachuca," (map) 25 November 1947. See "Acquisition Tract Register" and "Project Ownership Map" column. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, . 15-0135

[60]Public Land Order No. 16, "Withdrawing Public Lands for Use of the War Department as a Field Artillery Range," 21 July 1942, published in the *Federal Register* July 31, 1942, vol. 7, No. 150.

[61]Fort Huachuca DEH, "Abstract Acquisition History, Fort Huachuca Military Reservation, Cochise County -- Arizona," n.d. Fort Huachuca DEH, 11-0002.

quilles Land & Cattle Co.[62]

Under these real estate directives the fort acquired the private landholdings of 25 landholders between January 1943 and April 1945. Most were acquired in 1943. These tracts ranged in size from over 3,500 acres to as small as a single acre. The 10 one or two acre parcels were in small groups near the eastern border of the original reservation. However, of the remaining 15 most were between 120 and 640 acres; two were 1,129.52 and 1760 acres, respectively, and another was 2657.75 acres. Altogether the lands acquired in fee amounted to 9,588.66 acres. The lands acquired from private parties were those scattered among the public lands acquired from the federal and state government. A large portion -- some 15,177.9 acres -- of the Artillery Range was acquired by "implied lease" from the State of Arizona. Of this, 179.16 was a joint lease acquired from the state and Boquillas Land and Cattle Company.[63]

Department of the Interior Public Land Order No. 251, dated 22 November 1944, withdrew "Tract B" containing 80 acres for use of the War Department as an Artillery Range. It was limited to the "duration of the national emergency, plus six months" by Executive Order No. 9337, 24 April 1943, as amended by Executive Order No. 9526, dated February 28, 1945, which ended October 28, 1952. (S1/2NE1/4 sec. 34, T20S/R20E, G&SRM.[64]

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[62]Fort Huachuca DEH, "Abstract Acquisition History, Fort Huachuca Military Reservation, Cochise County -- Arizona," n.d. Fort Huachuca DEH, 11-0002.

[63]South Pacific Division, "Real Estate, Fort Huachuca," (map) 25 November 1947. See "Acquisition Tract Register" and "Project Ownership Map" column. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 19 2035

[64]Fort Huachuca DEH, "Abstract Acquisition History, Fort Huachuca Military Reservation, Cochise County -- Arizona," n.d. Fort Huachuca DEH, 11-0002; Public Land Order No. 251, "Withdrawing Public Land for Use of War Department for Artillery Range," 22 November 1944, published in the *Federal Register* 2 December 1944, vol. 9, No. 241, p. 14242.

POST WWII TRANSFER TO THE STATE OF ARIZONA AND REACQUISITION BY THE ARMY, 1945-1957.

Introduction.

The end of WWII led to a period of change for the military at Fort Huachuca and around the nation. Demobilization led military planners to contemplate deactivation or disposal of a number of military posts. Forts and other facilities that had once been centers of great activity and that had great economic impact on surrounding communities were considered for closings. Fort Huachuca was one such post. In the years between WWII and the Korean Conflict (1950-53) the federal government deactivated the post, declared it surplus, and transferred it to the State of Arizona for the use of the Game and Fish Commission as a wildlife refuge and the Arizona National Guard as a training facility. The deeds making the transfer had recapture clauses and other stipulations that retained for the federal government some control over the fort, and allowed its eventual recapture during the Korean War. Since its recapture it has remained in federal hands.

The Army during WWII reached a total of eight million men. With the end of the war and demands rising for demobilization, President Truman announced that by June, 1946 the Army would be reduced to 1.95 million; soon thereafter this was further pared by an additional 400,000. By spring 1946, the Army (with the Army Air Forces included) was to be cut to 1,070,000 officers and men. The National Guard, however, was to be enlarged somewhat over its pre-WWII levels, and by June 1950 there were 324,761 guardsmen in 4,597 units. Another 68,785 officers and 117,756 men were in the Organized Reserve's 10,629 units.[1]

The reductions, and reliance on citizen soldiers in the National Guard and reserve forces, reflected a national tradition of maintenance of a

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[1]Russell F. Weighly, *History of the United States Army.* (New York: The MacMillan Company, 1967), 477, 486-487.

small professional army augmented by citizen troops in times of emergency. Most plans for demobilization considered during WWII by the army included universal military service as an operating assumption; however, Congress was loathe to establish such an institution, considering it against American tradition. Congress went part way to universal service by requiring that men who joined or were inducted into the armed forces were obligated to military reserve service. A second act (the Armed Forces Reserve Act of 1952), decreed that three levels of reserves were to supplement the armed forces and National Guard, and reserves.[2]

The reduction in regular army troop strength (partially increased from post-WWII lows by the Korean War) and modest increase in National Guard activity played a role in what happened at Fort Huachuca. Furthermore, technical advances made during the war, with resulting changes in tactics and required training, led to increased military research and development that was also a factor in Fort Huachuca's future. Finally, after the Korean War the United States assumed a more international role and maintained a standing military force commensurate with such duties; Fort Huachuca became part of this effort.

Demobilization and Disposal, 1946-1949.

As the tide of war in WWII swung toward the Allies, residents and business men in southeastern Arizona grew worried over the fate of Fort Huachuca, which played such an important role in the region's economy. In September 1944, S. S. Shattuck, president of the Bisbee Chamber of Commerce, asked Arizona's influential U.S. Senator, Carl Hayden if he had heard of plans to abandon the post once victory was won. The senator assured him that he knew of no such plans. Furthermore, the War Department and others with whom Hayden conferred had agreed that its location was

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[2]Major John C. Sparrow, USA QMC, *History of Personnel Demobilization in the United States Army.* (Office of Military History, Department of the Army, mimeo., 1951), Chapter II, pp. 30-60. Official demobilization took place between 12 May 1945 and 30 June 1947; Russell F. Weighly, *History of the United States Army.* (New York: The MacMillan Company, 1967), 529-531.

ideal because of available room, varied terrain, and plentiful water. However, Hayden warned that because additional units would not be formed, the post would become inactive and held for possible future use. "Such action would in no way change Fort Huachuca from the permanent station class," Hayden advised. [emphasis supplied][3]

Nevertheless, with the end of the war came the closing that Shattuck feared. In May, 1946, Secretary of War Robert Patterson requested information from the Acting Chief of Staff on three post closings (Fort Devens, Fort McClellan, and Fort Huachuca) over which he had received "protests or inquiries." Hayden demanded Patterson justify the closings. Patterson noted that "these are all large, well established installations," and that protestants claimed they were being deactivated while other less-favored posts in the same region were retained in active status.[4] Gen. Thomas T. Handy, Deputy Chief of Staff, advised Patterson that there was not sufficient need for Fort Huachuca to save it in lieu of other better situated forts, particularly those in California. The cost of such a decision was high, and would mean closure of "currently active stations."[5]

Patterson used Handy's response to explain Fort Huachuca's future to Hayden. He recognized that this would trouble Hayden and citizens of Arizona, but explained that it was done for the sake of efficiency. "I wish to assure you, however," Patterson added, "that the War Department considers this installation a major command facility and, due to the

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[3]Senator Carl Hayden to S. S. Shattuck, 9-4-1944, Governor's Papers, Box 31, folder 5, ASA, 30-0022.

[4]Secretary of War Robert Patterson to Acting Chief of Staff, 5-17-1946. National Archives, RG 417, AGO 1946-48, 680.1, 5/16/46 to 5/31/46; ~~0036.~~ 01-0044

[5]Gen. Thomas T. Handy, Deputy Chief of Staff, to Sec. Robert Patterson, 5-28-46. National Archives, RG 417, AGO 1946-48, 680.1, 5/16/46 to 5/31/46; 01-0036.40 Earlier that month the Arizona legislature established a mechanism to purchase surplus federal property; see Chapter 11, Senate Bill No. 9, approved by the governor 3 May 1946.

excellent facilities which it affords, does not contemplate any action toward the declaration of the fort as surplus." Furthermore, "present plans indicated that the station will be used for the training of the National Guard and for the Organized Reserve Forces. In addition, it is quite possible, should the size of the peacetime military establishment so warrant, Fort Huachuca would be utilized for other Army activities." That would, of course, depend on congressional appropriations, so Patterson was unwilling to make definite commitments that the fort would be used by any other units than the National Guard and Organized Reserve Forces.[6]

By June 1946 the post was superintended by a caretaker staff. Special inspectors from the adjutant general's office reported the fort had 125 personnel (with a full population of 400, dependents included). They pointed out that the greatest danger to the post was fire, but noted that among the staff was a trained fire crew.[7]

In July Arizona Governor Osborn wrote to Hayden, worried that Fort Huachuca's inactive status might lead to closure. Osborn urged that it be "activated for all military purposes necessary and particularly as a training center."[8] Hayden made an effort over the next months to learn what the military had planned for the fort. In September he assured Osborn that he, and the Arizona congressional delegation, was striving to preserve the fort. Hayden then directed an inquiry to General Dwight Eisenhower.[9] The army, Eisenhower noted, had the fort under study "to determine its most effective utilization." At the time, he warned, the army had more posts than needed for troops, and also had to consider the

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[6]Robert Patterson to Carl Hayden, 5-29-1946. National Archives, RG 417, AGO 1946-48, 680.1, 5/16/46 to 5/31/46; 01-00~~36.~~ 46

[7]George L. De Cuir to Adj. ~~Inspection Report,~~ Adjutant General, 6-26-1946. National Archives, RG 417, AGO 1946-48, 333.1; 01-00~~26.~~ 51
01-0051

[8]Governor Osborn to Carl Hayden, 7-26-1946. Governor's Papers, Box 31, folder 5, ASA, 30-0024.

[9]Hayden to Osborn, 9-23-1946. Governor's Papers, Box 31, folder 5, ASA, 30-0025.

needs of state national guard and reserve units. "Present plans do not contemplate declaring Fort Huachuca surplus but envision its retention as a training installation for civilian components," Eisenhower wrote. "However, the final decision regarding the ultimate assignment of this post has not been made." He assured the senator that his comments would be given consideration.[10]

The army's studies determined that the fort should be turned over to the Arizona National Guard. (Other states' guard units also were to get forts; an example was Fort McClellan, Alabama.) In March, 1947, the Adjutant General sent its recommendation to Commanding General, Army Ground Forces. The Director, Organization and Training, recommended that Fort Huachuca be permitted to the state for use by the National Guard. The Adjutant General believed retention of the posts was unnecessary "From a training and organizational viewpoint there is no foreseeable need" for the listed installations."[11]

With the news that the Army was seriously considering declaring the fort surplus, various state agencies in Arizona considered how they might obtain it from the federal government. The agency of the federal government charged with managing disposal of surplus military property (both land and equipment) was the War Assets Administration (WAA), precursor of the General Services Administration (GSA).[12]

Among the first to act was the Arizona State Game and Fish Commission

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[10]Gen. Dwight D. Eisenhower to Hayden, 9-20-1946, and Hayden to Osborn, 9-24-1946. Governor's Papers, Box 31, folder 5, ASA, 30-0026 and 30-0027. Hayden sent Osborn a copy of a report from Eisenhower he received too late to send the day before.

[11]Adjutant General to Commanding General, Army Ground Forces, 3-3-1947. National Archives, RG 417, AGO 1946-1948, 602, 2-1-1947 to 2-28-1947, 01-~~0033~~. 0067

[12]The WAA was established by executive order in March 1946. It was abolished in June, 1949, and its functions transferred to the GSA. National Archives and Records Service, *Guide to the National Archives of the United States*. (Washington, DC: National Archives and Records Administration, GSA, 1974), 678.

(AG&FC). On April 7, 1947, even before the fort was officially declared surplus, AG&FC Director H. L. Reid informed Clyde P. Fickes, regional director of the WAA, that the commission was "highly desirous of procuring, under any possible arrangement, that portion of the land originally withdrawn for military purposes in 1881, to establish a wildlife study and management area thereon for public use and benefit."[13] The state had established the Arizona Surplus Property Purchasing Agency to aid in obtaining surplus properties following the war. Its director, Robert O. Kelly, informed Governor Osborn that the Los Angeles office of the WAA had asked that the AG&FC be given consideration when Fort Huachuca was officially declared surplus.[14] Soon thereafter AG&FC Director Reid advised Osborn that the commission only wanted the fort's rangelands. By late April 1947 the army prepared to place Fort Huachuca in surplus; but May 31, 1947 was the effective date of Fort Huachuca being declared surplus to the needs of the War Department. It would be transferred to the WAA for disposal.[15]

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[13]H. L. Reid to Clyde P. Fickes, 4-7-1947. Governor's Papers, Box 37A, folder 18, ASA, 30-0036 (see also 30-0216 to 30-0218); The idea of the post as a wildlife refuge did not excite everyone. In April the *Nogales Herald* prepared an editorial entitled "Missing a Chance" that maintained "the abandonment of Fort Huachuca is another example of government waste." "The old Fort, with its modern facilities, its substantial barracks and houses, its pure mountain water, its unexcelled climate, should become a great Veteran's Hospital." Governor's Papers, Box 37A, folder 18, ASA, 30-0038.

[14]Robert O. Kelly to Governor Osborn, 4-17-1947. Governor's Papers, Box 37A, folder 18, ASA, 30-0037.

[15]General Dwight D. Eisenhower to Congressman Richard Harless, Arizona, 4-28-1947. National Archives, RG 417, AGO 1946-1948, 602, 4-15-1947 to 4-30-1947, 01-0031. Eisenhower informed Harless that the decision to declare Fort Huachuca surplus was made only after careful consideration of needs of the nation and military; Sec. War Robert Patterson to Congressman Harless. National Archives, RG 417, AGO 1946-1948, 323.3, Fort Huachuca, 7-1-1947 to 7-15-1947, 01-0029; see also War Department Circular 124, May 16, 1947, p. 3, National Archives, RG 417, AGO 1946-1948, 602, 5-1-1947 to 5-14-1947, 01-0032; Reid to Osborn, 5-3-1947. Governor's Papers, Box 37A, folder 18, ASA, 30-0034.

The Arizona state senate passed a joint memorial in July 1947 urging that the state acquire Fort Huachuca if it were declared surplus by the War Department.[16] Soon other state agencies were considering obtaining the fort through the WAA. Governor Osborn suggested that the University of Arizona acquire the fort, a recommendation quickly adopted by the university's Board of Regents.[17]

Neither the university or AG&FC put together an application that would win the entire post. In November Kelly advised Governor Osborn that the two agencies were at loggerheads over how to cooperatively use the fort if it were acquired. The university objected to buffalo ranging on the reservation. The regents would come to a final decision by November 22nd as to how they would proceed.[18]

In December 1947 Kelly urged the governor to convince the competing agencies (university, AG&FC, and now the Arizona National Guard) to hammer out a unified position in order to present a united front at the hearings before the US Senate and House Armed Services committees scheduled for January 15, 1948.[19]

The AG&FC made a formal application to Governor Osborn on January 9, 1948, offering to purchase at fair market value 24,000 acres of range land at Fort Huachuca. Director Reid noted, "in line with the War Department's

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[16]Arizona Senate Joint Memorial No. 1, 18th Legislature, 1st Special Session, sent to Arizona Congressman Robert Harless for action, 7-1-1947. National Archives, RG 417, AGO 1946-1948, 323.3, Fort Huachuca, 7-1-1947 to 7-15-1947, 01-00~~29~~57.

[17]J. Byron McCormick, President of the University of Arizona to Gov. Osborn, 7-28-1947. Governor's Papers, Box 87, folder 1, ASA, 30-0212 and 30-0213; (McCormick attached a copy of the university's letter to WAA regional office in LA, also dated 7-28-1947); Robert O. Kelly to Governor Osborn, 8-12-1947. Governor's Papers, Box 87, folder 1, ASA, 30-0214.

[18]Kelly to Osborn, 11-14-1947. Governor's Papers, Box 87, folder 1, ASA, 30-0026.

[19]Kelly to Gov. Osborn 12-11-1947. Governor's Papers, Box 87, folder 1, ASA, 30-0231; H. L. Reid to Gov. Osborn, 12-20-1947. Governor's Papers, Box 37A, folder 14, ASA, 30-0032.

policy of preparedness in the event of a national emergency, this land would be readily available for conversion to its former war-time use."[20]

The Arizona National Guard followed with a request of its own. On January 12, 1948, Major General A. M. Tuthill, Adjutant General of the Arizona National Guard, "earnestly requested" that Governor Osborn advise the Army that the Guard wanted Fort Huachuca. Tuthill urged the governor to request such an executive order from the president, "to encompass the present acreage at Fort Huachuca and improvements known as the 'Old Post.'"[21] By January 15 Robert Kelly of the State Surplus Property Purchasing Agency reported that there were now a number of contenders for Fort Huachuca.[22]

The WAA formally declared the fort surplus on March 17, 1948. For the next months that agency considered the applications before it for disposal, and by July it leaned toward granting the entire post to the state and its agencies. However, on March 26, 1948 a small portion of the post had been quickly deeded over to the state: the post cemetery.[23]

One important issue facing the state was the extent to which the Department of the Interior would try to regain federal lands for the public domain. On August 3, 1948, both Hayden and Senator McFarland advised Kelly

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[20]H. L. Reid to Governor Osborn, 1-9-1948. Governor's Papers, Box 82, folder 10, ASA, 30-0155. A letter essentially of the same substance was also sent by Reid to Secretary of the Interior Julius Krug the same day. National Archives, RG 417, AGO 1946-48, 602.2, 1-1-1947 to 12-31-1947; 01-0035.0075

[21]Major General A. M. Tuthill, Arizona National Guard, to Governor Osborn, 1-12-1948. Governor's Papers, Box 82,, folder 10, ASA, 30-0149.

[22]Robert O. Kelly to W. E. Craig, 1-15-1948. Governor's Papers, Box 82, folder 10, ASA, 30-0153.

[23]"Memorandum to Deputy Administrator - PD 10 DEC 1948," 3-17-1948. Governor's Papers, Box 82, folder 10, ASA, 30-0089; USCoE Phoenix, Real Estate Office, 0006; Thomas Peyton to Hayden, 7-15-1948. Hayden Collection 35:35, Arizona Collection, ASU, 20-0143.

that WAA representatives had met with Interior officials regarding Ft. Huachuca. The department wanted, they noted, to obtain all land not needed by state or its agencies, but did not want lands requested by state. "Burden of proof of need of all land," wired McFarland, "rests with state in submitting its application."[24]

The Arizona National Guard sent its application the next day, for the 31,000 acre Artillery Range, and the land and buildings in the "Old Post" -- Areas 1-6, Area 10, isolated buildings in Areas 11 and 12, and the airfield in Area 18. Major General Tuthill submitted the application "in the event of withdrawal of the application by the State of Arizona Industrial School." He also wanted small arms target areas with associated structures in Area 17 to be transferred to the state for the use of the Guard. Furthermore, the Guard requested "a Right of Entry" to the entire fort be reserved to the National Guard of Arizona to conduct extensive field training maneuvers."[25]

Hayden and state officials learned soon thereafter that the Department of the Interior would not stand in the way of the fort's transfer. On August 13, 1948, Assistant Secretary of Interior C. Girard Davidson explained to Hayden that some of the lands within the approximately 75,000 acres of Fort Huachuca were withdrawn for use of the army from the public domain. Normally the Department of the Interior would want them back if they were without improvements, but the WAA had been given authority to include them in the lands to be transferred to the State of Arizona. "Because of the public and beneficial nature of the work of the State agencies," Davidson said, "there was no desire on our part to handicap them in obtaining the surplus lands at Fort Huachuca which they needed to complement the use of the improvements." The BLM and WAA had conferred on

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[24]McFarland to Kelly, and Hayden to Kelly, 8-3-1948. Governor's Papers, Box 82, folder 10, ASA, 30-0143.

[25]Major General A. M. Tuthill to Robert Bradford, WAA, attn: Ralph Merritt, Ft. Huachuca, 8-4-1948. Hayden Collection 35:35, Arizona Collection, ASU, 20-0146. Copy sent to Garvey, Ernest McFarland.

August 2nd. Since the disposal process was well underway and assumed transfer of some of these lands, the agencies decided to go ahead. The WAA would return to the Department of the Interior any lands not needed by the state once the process was complete.[26]

The Air Force in September 1948 apparently made inquiries about taking over a portion of the post -- Kelly warned Gov. Garvey that he heard a rumor through WAA's project manager at Fort Huachuca, Ralph Merritt, that the USAF might try to acquire 9,000 acres in the Garden Canyon area, along with the 500 acre air strip. Merritt warned the USAF that the AG&FC had an approved application; nevertheless, Kelly urged Governor Garvey to ask Arizona's senators to have the USAAF withdraw. The WAA planned to sell a large number of buildings on the post cantonment area to school districts and other public entities. Kelly added that parts of the utilities would also be sold. "We have already made arrangements with Mr. Merritt to transfer the entire water facilities, pipes, pumps, etc. to the Arizona National Guard," he explained. "This pipe will be used for replacements in the old area and will save the State thousands of dollars in expenses."[27]

By November 1948 the WAA was nearing its decision. Hayden had continued to monitor developments regarding the fort's transfer, and at the beginning of the month WAA Deputy Director Robert Whittet advised the senator that there were at that time three applications: 1) 42,000 acres and some buildings for AG&FC; 2) 32,000 acres and buildings for National Guard; and 3) 1800 acres and some buildings for use of the State Industrial School. The university dropped out of the competition. The AG&FC application was in Washington; the National Guard's was being worked on in the WAA San

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[26]C. Girard Davidson to Hayden, 8-13-1948. Hayden Collection 35:35, Arizona Collection, ASU, 20-0144.

[27]Robert Kelly to Gov. Garvey, 9-18-1948. Governor's Papers, Box 82, folder 10, ASA, 30-0137.

Francisco regional office.[28] Soon thereafter Kelly advised "Acting Governor" Dan Garvey [Gov. Osborn died in office] that he had arranged a conference with Ralph Merritt for November 18, 1948, at which he believed final steps could be taken for acquiring Fort Huachuca for the state. Merritt had most of the paper work completed.[29]

In the meantime the Army expressed its support for the National Guard. Brig. Gen. Garrison H. Davidson, Chief of Staff, HQ Sixth Army, advised the army's Director of Logistics that the Sixth Army considered transfer of Fort Huachuca to the Arizona National Guard "essential" for three reasons: 1) present training facilities at Fort Tuthill were insufficient; 2) Fort Huachuca could cheaply be put into shape for use; and 3) the fort could be used (as it was in the 1930s by reserves and the CMTC program) by ROTC and ORC units as well as the National Guard. The application, Gen. Davidson stated, "fully warrants approval."[30] At the beginning of December the National Guard Bureau asked Jess Larson, administrator of the WAA, to favorably consider the Arizona National Guard's application. Their petition included the Sixth Army's letter and a certification from Secretary of the Army that the "1164 buildings, all utility systems and approximately 44,000 acres of land at Fort Huachuca, Arizona, are both suitable for and needed by the State of Arizona for use in the training of the Arizona National Guard." On December 6, 1948 Ralph Merritt sent WAA headquarters the Arizona National Guard's application and certificate from the Secretary of the Army. The San Francisco WAA regional office endorsed the application. Shortly thereafter Kenneth C. Royall, Secretary of the Army, sent the WAA his certification that items at Fort Huachuca listed in

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[28]WAA Deputy Director Robert Whittet to Hayden, 11-3-1948. Hayden Collection 35:35, Arizona Collection, ASU, 20-0150.

[29]Robert O. Kelly to "Acting Governor" Dan Garvey, 11-15-1948. Governor's Papers, Box 82, folder 10, ASA, 30-0132.

[30]Brig. Gen. Garrison H. Davidson, Chief of Staff, HQ Sixth Army, SF, to Director of Logistics, Dept. of Army, Washington DC. 11-27-1948. Governor's Papers, Box 87, folder 2, ASA, 30-0320; see also Hayden

the application of the Governor of Arizona for the post were "both suitable for and needed" by the guard.[31]

With these filings the transfer from the WAA to the Arizona National Guard and AG&FC went rapidly ahead. Since two agencies were to use the post the WAA was concerned that each be given access to water. The WAA urged that the National Guard be given control over the post water supply, but with provision for providing water to the AG&FC. On December 10, 1948, Thomas L. Peyton, Director, Non-Industrial Division, Office of Real Property Disposal, WAA, prepared an analysis of Fort Huachuca disposal urging that land be granted to AG&FC subject to limitations imposed by use of other areas by the National Guard. Reserved from the transfer to the AG&FC should be "all developed springs located on land herein transferred in Garden Canyon and Huachuca Canyon, and all pipe lines connecting such springs with reservoirs on Reservoir Hill (in National Guard area), together with necessary easements, with rights of ingress and egress to repair and maintain same." This recommendation was approved by the WAA deputy administrator.[32] On the next day Senator McFarland's assistant Thomas L. Hall advised Governor Garvey that the two applications had been accepted. The WAA had under preparation papers required for conveyance to the National Guard; the AG&FC's documentation might be delayed somewhat by the requirement that the transfer be given advance

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Collection 35:35, Arizona Collection, ASU, 20-0153.

[31]National Guard Bureau of the Dept. of the Army to Jess Larson, 12-3-1948. Governor's Papers, Box 87, folder 2, ASA, 30-0321 (see also Hayden Collection, Arizona Collection 35:35, ASU, 20-0154 and 20-0155); Ralph Merritt to Washington HQ of WAA, 12-6-1948. Hayden Collection 35:35, Arizona Collection, ASU, 20-0157; Kenneth C. Royall to Jess Larson, 12-8-1948. Hayden Collection 35:35, Arizona Collection, ASU, 20-0158.

[32]Thomas L. Peyton, Director, Non-Industrial Division, Office of Real Property Disposal, WAA, analysis of Fort Huachuca disposal, 12-10-1948. Governor's Papers, Box 87, ASA, 30-0319. However, in a memo to the deputy administrator, also 12-10-1948, Peyton does not mention reserving from the transfer springs, feeder lines, etc. Hayden Collection, Arizona Collection, ASU, 20-0162.

publication in Federal Register.[33] Merritt told Senator Hayden that, basically, the National Guard got "land, buildings and utilities," the AG&FC got "range and mountainous areas."[34]

If the Arizona National Guard took possession of the built up portion of the post, it would have to maintain it. However, the Guard did not have the necessary capital to do so without the ability to raise money through sales of facilities or rental of a portion of the post. In January, 1949, Merritt, who hoped to stay on at the fort after transfer as its manager, presented Governor Garvey an estimate of costs for maintaining and managing Fort Huachuca for the Guard, and how they might be met. He proposed to raise money through lease of Areas 1 to 6 and Area 18, which were housing areas and would remain so; military use would be kept to Areas 7 through 17 and the Artillery Range. He believed his plan would provide an "opportunity for opening to the public an unique historical monument and a recreational and housing area which, when combined with the proposed plans of the Game and Fish Commission in the protection and increase of native wildlife, will become of great importance to this part of Arizona." Merritt proposed to attract light industries, rent houses, lease portions of the post to recreational and educational institutions, and make use of "other opportunities to create income offered to the National Guard by the terms of the deed of Fort Huachuca."[35]

Despite the necessity of prior publication in the Federal Register, it was the deed from the US to Arizona for use as a wildlife refuge under the AG&FC that was ready first. The deed granted a portion of the fort for

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[33]Thomas L. Hall (Senator McFarland's assistant) to Governor Garvey, 12-11-1948. Governors' Papers, Box 82, folder 10, ASA, 30-0123.

[34]Merritt to Hayden, 12-28-1948. Hayden Collection 35:35, Arizona Collection, ASU, 20-0163; letter of transmittal to Hayden's assistant with file contents 20-0164.

[35]Ralph P. Merritt, 1-10-1949. Governor's Papers, Box 99, ASA, 30-0052. Merritt's plan was similar to that later adopted by Fort Huachuca Enterprises, Inc.

US Gov't

specific use as wildlife refuge, and reserved to the grantor springs and conveyances taking water from Garden Canyon. The commission received the range lands to the north, along with the mountains on the western side of the post, extending to the south and southeast, essentially enclosing on three sides the post's built-up area. The Artillery Range and built-up portion remained outside this deed. The 32,752.56 acres of land was supplemented with 18 buildings "and certain water rights" (the AG&FC was to be supplied with water from the post system at no charge). The deed specified that if the area was not used as a wildlife refuge, ownership would revert to the US.[36] Official transfer took place at midnight February 15, 1949.[37]

The National Guard's deed was delayed at its own request. The guard wanted time to take a careful inventory of property, make changes in personnel, survey boundaries, and complete plans for the state takeover. It also wanted to provide for adequate fire and police protection for the post.[38]

By March 2, 1949, the US and State of Arizona signed the deed transferring the remainder of the post -- the "old post" area plus the artillery range -- to the Arizona National Guard. It included the Fort Huachuca Artillery Range; the remaining buildings; utilities; the spring water system that had been specifically excepted from the deed to the state on behalf of the AG&FC; all wells and water pipes, in Areas 1-6, 7, 10, 13, 14; water pipe lines in Areas 8, 9, 11, 12 "necessary to active service with the water system"; and all wells in Areas 12 and 14, with pumps, chlorinators, and connecting services. The deed also contained seven stipulations: 1) that for 20 years the area be used for no other

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[36]Quitclaim Deed, US to Arizona, 1-14-1949. USCoE Phoenix, Real Estate Office, ~~0007.~~ 15/0059

[37]US, acting through WAA, to AG&FC, 2-15-1949. Governor's Papers, Box 77, folder 2, ASA, 30-0057.

[38] Col. Frank Fraser to General Tuthill, 1-15-1949. Governor's Papers, Box 99, ASA, 30-0052.

purpose than to train civilian components of the armed forces; 2) that the state could not sell, lease, or otherwise dispose of the premises described in the deeds (except for some livestock leases) without federal approval; 3) that the state could abrogate conditions and covenants with specified payments and approvals; 4) that the US could reacquire full possession "during the existence of any national emergency" declared by the president or congress, at federal cost, and that the federal government would pay rent for use of facilities erected during state possession; 5) that if conditions stipulated were not met by the state, the federal government could immediately take possession; 6) if so taken, Arizona would take action to return the premises to the federal government; and 7) that the Arizona National Guard would furnish AG&FC the necessary utilities to their 18 buildings, with water to be provided free.[39]

The Period of State Ownership and Control, 1949-1951

The transfer of the National Guard portion of the post to the state was done with the aim of providing the state adequate facilities for its state military units, which the Army had wanted to do before the WAA got the task of handling its disposal. The deed attached strings to assure continued military use of the area transferred at least for 20 years. This was done partly to assure that, should the post later be reacquired for federal use, it would be in a ready condition. General federal military policy also played a role. As noted earlier, with the mass demobilization that followed WWII the army decided to increase the National Guard to levels higher than those of the pre-war period. The troops would need proper places to train, and surplus military posts like Fort Huachuca

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[39]Deed between US and Arizona, 3-2-1949. USCoE Phoenix, Real Estate Office, ~~0008;~~ 3-2-1949 Bill of sale, US to Arizona, for Ft. Huachuca. On April 9, 1949, Robert O. Kelly advised Clarence Hull, regional counsel of the WAA in San Francisco, that the quitclaim deeds conveying portions of Fort Huachuca to the state were filed on March 31, 1949 at 9:00 am, Docket Number 22, pages 422-426, and 427-456 (in Cochise County). Bill of Sale filed on pages 457-466. Kelly to Hull, 4-9-1949. Governor's Papers, Box 82, folder 2, ASA, 30-0195.

would serve admirably. One string attached in the deed specified that if the National Guard were to lease building space, or sell surplus buildings or other equipment, all income derived was to be deposited with the state National Guard fund and limited to use for maintenance of Fort Huachuca. Furthermore, the federal government would provide some money each year for repairs and maintenance, for "opening and closing costs" associated with annual training activities.[40]

Potential problems began to arise with the deeds soon after they were filed. In mid-April 1949 State Surplus Property Purchasing agent Kelly asked the Corps of Engineers Phoenix District Real Estate Field Office chief Ed Atkinson if some of the lands in the Fort Huachuca Artillery Range and Auxiliary Air Fields had been exchanged with the Department of the Interior. Kelly wanted to know if the exchange would have an effect on the state's recently received deeds.[41] Atkinson observed that the

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[40]Weighly, ~~*History of the United States Army*~~, 486; Col. Frank E. Fraser, ANG, to members of the Arizona State Senate, 3-12-1949. Governor's Papers, Box 99, ASA, 30-0053. For example, soon after receiving the deed for its area, the Arizona National Guard invited bids and specifications for sale for railroad track and water pipe of various kinds and sizes "now installed at Fort Huachuca ... and surplus to the needs of the National Guard of Arizona." Pipe included 11,000 ft. of 12 in. cast iron; 7,000 ft. of 10 in. cast iron; about 6,000 ft. 8 in. cast iron; 5,400 ft. 6 in. cast iron; "residual small water pipe in same areas; transit pipe 12 in. and 6 in. in Area 8, and "2 steel water tanks on steel frames 500,000 gallons each." Virtually all of the pipe was in areas 8, 9, 10, 12, and 14, and in major streets. Arizona National Guard, invitation for bids and specifications, 4-20-1949. Governor's Papers, ASA, 0067. The Arizona National Guard's Col. Fraser explained that Areas 1 to 6 were essentially the old post area; 7 to 14 were "the built up areas sometimes referred to as the New Cantonment Area or the Cantonment Area, except for permanent fixtures as wells, pumping plants, sewage disposal plants. Practically all of the construction is frame in the Areas 7 to 14 inclusive." The water, electrical and sewer system were transferred in the deed to the guard. The buildings sold were in Areas 8, 9, 11, and 12, except for those reserved for use by Game and Fish; the guard got all of the water pipelines in areas 1-14. Col. Fraser, to Governor (?), 6-23-1949. Governor's Papers, Box 82, folder 2, ASA, 30-0171.

[41]Robert O. Kelly to Corps of Engineers Phoenix Real Estate Field Office, Ed Atkinson, 4-18-1949. Governor's Papers, Box 82, folder 2, ASA,

WAA did not have authority to include public domain lands loaned to the Army in the artillery range in title documents with the transfer to the state.[42] Governor Garvey asked Hayden to urge the Department of Interior, Army, and WAA to meet to straighten out the title problems with lands in the artillery range that were only loaned to the fort during the war (plus 6 months) from the public domain, and which were later transferred to the state with the rest of Fort Huachuca. He worried that title problems would begin to cause trouble as troops arrived for training, the planning for which (and expenditures for which) were underway.[43]

The title problems affected both the National Guard and AG&FC areas. At the end of May, Atkinson warned the AG&FC and Guard that there were irregularities with the deeds granted for Fort Huachuca; most important, both deeds specified the same areas. Atkinson offered his office's help in resolving the matter.[44] Soon thereafter Governor Garvey told Hayden that "it is vitally necessary that this land (the artillery range) be returned to the National Guard for use in their maneuvers at the Fort."[45] If the built-up area of the post were the only portion available to the National Guard, their training maneuvers would be too restricted.

30-0263.

[42]Atkinson to Kelly, 4-21-1949. Governor's Papers, Box 82, folder 2, ASA, 30-0264; Atkinson also wrote to the LAD Engineer, Real Estate Division. Hayden Collection 35:35, Arizona Collection, ASU, 20-0168.

[43]Garvey to Hayden, 5-6-1949. Governor's Papers, Box 82, folder 2, ASA, 30-0164; see also Hayden Collection 35:35, Arizona Collection, ASU, 20-0166; Fraser to Garvey, 5-19-1949. Governor's Papers, Box 82, folder 2, ASA, 30-0168.

[44]Ed Atkinson to AG&FC and National Guard, 5-31-1949. Governor's Papers, Box 82, folder 2, ASA, 30-0194.

[45]Garvey to Hayden, 6-1-1949. Governor's Papers, Box 82, folder 10, ASA, 30-0112.

The apparent confusion over land titles to the artillery range was not a major concern to the Department of the Interior. In July, 1949, Assistant Secretary Davidson informed Kelly that title to lands taken out of the public domain for the army and later declared surplus and transferred to the guard "would not be affected by the provisions in the public land orders for the return of jurisdiction to the Department of the Interior at the end of the sixth months' [sic] period following the termination of the unlimited National Emergency." That same day Admiral Paul Mather, Liquidator of War Assets, advised Hayden that a correction deed would straighten out all confusion regarding the artillery range; the federal government never took title or made exchanges for state land, so 14,000 acres of the range remained in state title; the rest were validly transferred by the deed. Mather suggested that a correction deed be made to release the federal government's possessory title, if any, in the state lands within the artillery range. Hayden sent the letter on to Garvey on July 8, 1949.[46]

Between mid-July and mid-August 1949 a series of letters passed between Governor Garvey, the Corps real estate official Atkinson, and the BLM, regarding public lands within the artillery range. Garvey told Atkinson that some 4000 acres of public land withdrawn for the Army's use in the artillery range "constitutes a hazard to the permanent use of the artillery range by the Arizona National Guard." He wanted Public Land Orders Numbers 16 and 251 revoked since "the Army has abandoned this Fort area." The guard would want the same area for its own use as an artillery range, and Garvey asked that Atkinson make requests to "proper Federal authorities." Atkinson agreed. Later, in August, Garvey asked the BLM to grant authority for the guard to enter the public domain scattered within the artillery range; they were then on maneuvers and the blocks curtailed

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[46]C. Girard Davidson to Kelly, 7-5-1949. Hayden Collection 35:35, Arizona Collection, ASU, 20-0172; Adm. Paul Mather, Liquidator of War Assets, to Hayden, 7-5-1949. Hayden Collection 35:35, Arizona Collection, ASU, 20-~~0167.~~
0182

their actions. Garvey also asked the BLM to withhold applications for use of the land until state could file its own application. BLM director Roscoe Bell advised Garvey that he was unaware of public domain lands in the artillery range so the governor sent him a list of the lands in question. The BLM then sent the state special use permits for land in the artillery range.[47]

The interested parties -- WAA, and the governor, land commissioner, and attorney general of Arizona -- conferred about land title problems at Fort Huachuca in late August. Jess Larson, administrator of the General Services Administration/War Assets, later advised Hayden that issuing a correction deed regarding land titles in the artillery range was an acceptable solution, and Larson sent this request to Secretary of Defense Louis Johnson, noting that besides the problems in the artillery range, "it further appears that in connection with a portion of the Military Reservation which was intended to be conveyed, some errors in description occurred with the result that no portion of the lands within the Military Reservation was effectively conveyed to the State of Arizona." Larson asked Johnson to order issuance of a correction deed to clear up the title confusion.[48]

As noted earlier, the Arizona National Guard was concerned about how it might raise sufficient funds to maintain and operate its new facility. The confused title did not help. In November, 1949, Maj. Gen. A. M. Tuthill reported to Governor Garvey on the situation at Fort Huachuca:

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[47]Garvey to Atkinson, 7-19-1949. Governor's Papers, Box 82, folder 10, ASA, 30-0092; Atkinson to Garvey, 7-20-1949. Governor's Papers, ASA, Box 82, folder 10, ASA, 30-0092; Garvey to Director of the BLM, 8-12-1949. Governor's Papers, Box 82, folder 10, Box 42, folder 38, ASA, 30-0041; BLM director Roscoe Bell to Garvey, 8-15-1949. Governor's Papers, ASA, Box 82, folder 10, ASA 30-0091; Mr. Falck, acting director of the BLM, to Garvey, 8-25-1948. Governor's Papers, Box 82, folder 10, ASA, 30-0094.

[48]Jess Larson to Hayden, 9-2-1949. Governor's Papers, Box 82, folder 2, ASA, 30-0176; see Hayden Collection 35:35, Arizona Collection, ASU, 20-0174; Larson to Secretary of Defense Louis A. Johnson, 9-2-1949. Hayden Collection 35:35, Arizona Collection, ASU, 20-0175.

> It would be inappropriate not to mention briefly Fort Huachuca, Arizona, the area assigned as a training area for the National Guard of Arizona Army Forces. The federal government has indicated that they cannot maintain the operation of Fort Huachuca, however, certain funds are available for the opening and closing of the Camps held there during the period the National Guard of Arizona is in training. Repairs and maintenance of warehouses, mess halls, bath houses, and similar facilities will to a certain extent be maintained by the federal government, but barracks and quarters will not be. At present under the provisions of Chapter 57, there is insufficient money allocated to repair or maintain this large installation. Every effort is being expended by this office to maintain careful supervision over the property in question, and to spread each dollar as thinly as possible in maintenance.[49]

Soon thereafter Tuthill asked Atkinson to try to expedite issuance of the corrected deed, as all required actions seemed to have been taken in Washington. Lacking a deed and title surety, he complained, held up planning and expenditures of state National Guard funds earmarked to protect the fort.[50]

The uncertain situation persisted into 1950. In January, Thomas L. Kimball, director of the AG&FC discussed with Governor Garvey the "discrepancy in the deeds to Fort Huachuca relative to the division of land between the Arizona Game and Fish Commission and the Arizona National Guard." Kimball wanted the governor to have the guard take into account the work that the commission had done in what they thought was their area -- expensive fencing in particular. Two days later the state Guard General Staff reported to Garvey that "the status of Fort Huachuca be clarified with the least possible delay and if necessary, the Adjutant General is hereby authorized to take such steps as he may deem necessary to expedite

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[49]Maj. Gen. A. M. Tuthill to Governor Garvey, report for 7-1-1946 through 6-30-1949, 11-4-1949. Governor's Papers, Box 99, ASA, 30-0049.

[50]Tuthill to Atkinson, 11-21-1949. Governor's Papers, Box 82, folder 2, ASA, 30-0184.

the completion of the deed that now disputes the title of Fort Huachuca to the National Guard of Arizona." Also, the adjutant general was to make every effort to have the legislature and governor amend Chapter 67, Laws of 1949, "better known as the 'Fort Huachuca Bill'" to allow for better maintenance of principal installations at the fort so that it can be used "for the purpose for which Fort Huachuca was transferred to the State of Arizona." They also approved a request from the adjutant general to ask federal permission to sell Areas 10 and 13, "comprising what is known as the artillery area [not to be confused with the Artillery Range] and the hospital area." The proceeds would be used to rehabilitate and modify "that much of the built up area in Fort Huachuca that may be necessary for the housing and storing of the equipment" of the Arizona National Guard.[51] By January 27, 1950, Garvey advised AG&FC director Kimball that corrected deeds were being prepared; he hoped there would be no further arguments. "We have had enough trouble with these deeds," stated the governor, who urged that the AG&FC and the guard should come to a working relationship.[52]

At the same time the state continued efforts to lease and sell areas of buildings within the post to raise money for the guard. In April Lyndon L. Hargrave of the Benson Chamber of Commerce wrote to Garvey to express his support of a proposed lease between the state and Fort Huachuca [Enterprises] Inc., a non-profit corporation "for the dual purpose of maintaining the installation and furnishing low-rental housing to disabled veterans, health seekrs [sic] and others in need of such housing."[53] Also in early April a meeting of the Arizona National Guard General Staff

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[51]Thomas L. Kimball to Governor Garvey, 1-9-1950. Governor's Papers, Box 77, folder 2, ASA, 30-0079; Arizona National Guard General Staff to Garvey, 1-11-1950. Governor's Papers, Box 99, ASA, 30-0051.

[52]Garvey to Kimball, 1-27-1950. Governor's Papers, Box 77, folder 2, ASA, 30-0078.

[53]Lyndon L. Hargrave to Garvey, 4-7-1950. Governor's Papers, Box 87, folder 4, ASA, 30-0250.

(among whom were Tuthill and Barry Goldwater) discussed the proposed sale of Area 10 and 13, with all improvements. The Army had advised that if the state wanted to sell portions of Ft. Huachuca, they would have to submit a written request and "recommend to the Governor that he make formal request to the Federal agency for the sale of the areas and to justify and explain how the money will be used." The General Staff explained, "it is necessary to sell facilities in Areas 10 and 13 to maintain and repair Fort Huachuca, such as warehouses, motor pumps, tanks, quartermaster depot, ice plant and others ... as things are now going to rack and ruin."[54]

The state kept trying to find a commercial or industrial enterprise to lease the fort, especially as unemployment in the area was increasing. One fell through in July 1949. In mid-April the state found a tenant for the "Old Post" portion of Fort Huachuca. On April 11, 1950, Governor Garvey signed a lease for a portion of the post with John Pintek's Fort Huachuca Enterprises, Inc. The lease included use of certain buildings (listed in appendix A) in Areas 1-6. It ran for 10 years at $1.00/yr., plus 35% of gross income once $5000 had been earned. Pintek's group had an option to renew for another 10 years. Fort Huachuca patrons and guests could have the run of the reservation, subject to areas warned as dangerous; the state was to be held harmless. Tuthill had earlier informed Garvey that he and his staff had looked over the lease and approved.[55]

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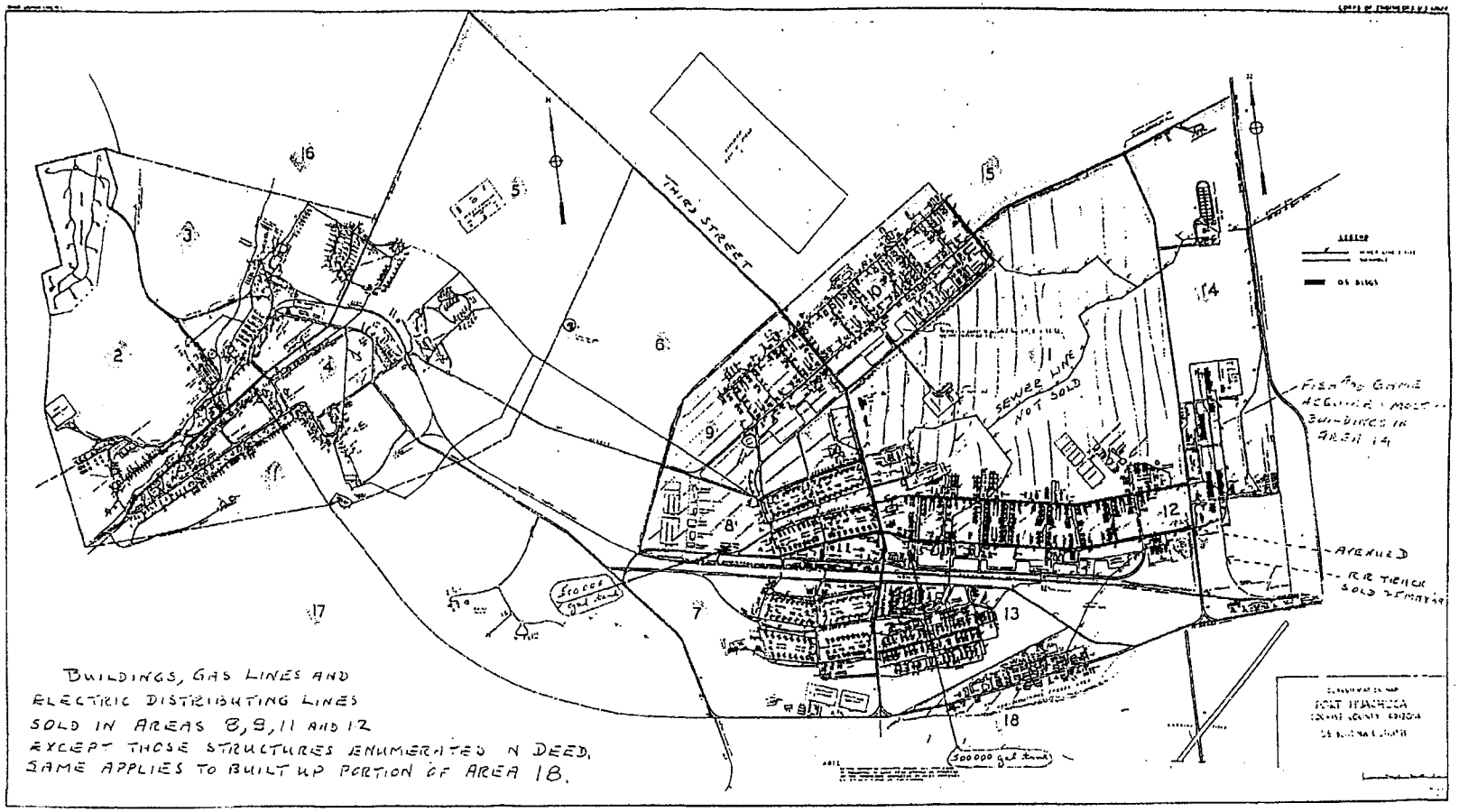
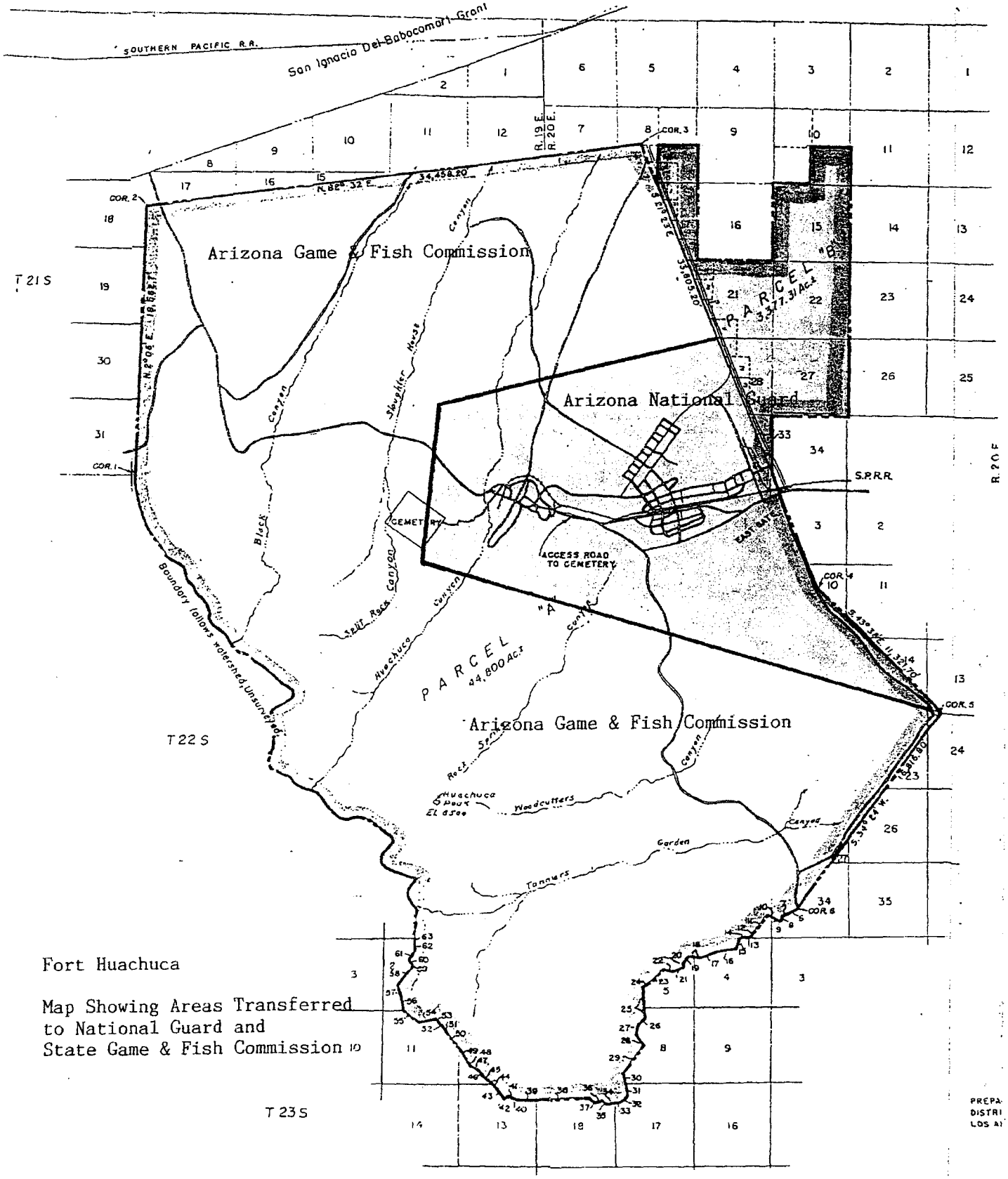
[54]Meeting of the Arizona National Guard General Staff, 4-8-1950. Governor's Papers, Box 99 ASA, 30-0050.

[55]Garvey to Tombstone Chamber of Commerce, 7-13-1949. Governor's Papers, Box 42, folder 38, ASA, 30-0039; Garvey to Fred Wilson, 5-30-1949. Governor's Papers, Box 82, folder 2, ASA, 30-0191; Garvey to Hon. David J. Marks of Bisbee, 6-13-1949. Governor's Papers, Box 42, folder 38, ASA, 30-0044; Garvey to the business men of Bisbee, DATE? Governor's Papers, Box 42, folder 38, ASA, 30-0046; Governor Garvey, lease for a portion of Ft. Huachuca with John Pintek's Fort Huachuca Enterprises, Inc., 4-11-1950. Governor's Papers, Box 87, folder 4, 30-0260 and 30-0261. Fort Huachuca Enterprises, Inc., a non-profit organization directed by Pintek and other southeastern Arizonans, was described in glowing terms in a January 1951 article published in *Arizona Highways*. The article pointed out that the National Guard used the post for two weeks each



Areas 1 - 18, Fort Huachuca; note at left refers to sales by WAA and State of Arizona.



Fort Huachuca

Map Showing Areas Transferred to National Guard and State Game & Fish Commission

On April 18, 1950, the US issued a correction deed to the State of Arizona. It remedied some of the ambiguities and other problems found in the deed of March 2, 1949 to the state for the National Guard area. It reaffirmed the grant to the National Guard of the water system; it also specified land, "together with those developed springs and the water rights appertaining thereto, known as Garden Canyon and Huachuca Canyon ... heretofore conveyed ... for the use and benefit of [the Arizona] State Game and Fish Commission by deed dated January 14, 1949." The deed restated the seven stipulations listed in the guard's previous deed.[56]

With the deed in hand Governor Garvey sent a request to GSA director Larson that the guard be allowed to sell buildings and improvements in Areas 10 and 13, and the income used for "maintaining the portions of the old post and that of the cantonment area necessary for the housing and training of the Arizona National Guard."[57]

The Korean War and Reacquisition, 1950-53

The uneasy calm existing after WWII in international affairs was broken with the outbreak of war on the Korean Peninsula. After June 1950

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summer "for intensive maneuvers." Officers' quarters and enlisted barracks were now to serve as residences or meeting halls; light industrial concerns were hoped to take root in industrial quarters. The post was equipped with facilities like pools and stables, and with a powerhouse to provide supplemental electricity. "An adequate water supply, cause of worry in other parts of Arizona, is assured the residents of the Post. During the last war, with its heavy population, the largest single-day water consumption was 3,900,000 gallons -- well below the 5,400,000 gallon capacity of the Fort's wells and natural springs." Dick Stitt, "Fort Huachuca Enterprises." *Arizona Highways*, January 1951, 28-33.

[56]Correction Deed, US to AZ, 4-18-1950. USCoE Phoenix, Real Estate Office, ~~15-0010.~~ On June 8, 1950 Atkinson sends to Governor Garvey an official copy of the correction deed, for which were required state seals and official signatures. Atkinson to Garvey, 6-8-1950. Governor's Papers, Box 82, folder 2, ASA, 30-0185.

[57]Garvey to Hayden, 5-10-1950. Hayden Collection 35:35, Arizona Collection, ASU, 20-0179.

the nation found itself drawn into a widening war in Asia, a conflict that caused the Army to expand, at the war's height, to more than 2.8 million men. Some of the additional troops were federalized National Guard units from California and Oklahoma, others were regular army troops; all were augmented by extension of Selective Service. The initial invasion of North Korean troops pushed an unprepared South Korean force nearly off the peninsula; troops rushed from the US and under the United Nations forced the North Koreans back deep into their territory. However, in late November 1950 the Chinese Army launched 300,000 men into North Korea to defend their ally and push Allied forces away from their borders. After the Chinese attack, and the resulting withdrawal of Allied troops to the south, the war settled into a costly stalemate.[58] The needs of the war played a role in the reactivation, and eventual reacquisition, of Fort Huachuca by the federal government.

Soon after the initial invasion by the North Koreans, the Bisbee Chamber of Commerce urged Hayden to have the military look into reactivating Fort Huachuca. They cited the "Korean situation," which "makes urgently necessary the training of ground troops." They pointed out that the fort had "all facilities available for two or more divisions ... [and an] abundance of water ..." Hayden and the rest of the delegation responded soon thereafter [date?] noting that at that time the military did not see a need to reacquire the fort from the state.[59]

In October, while the UN troops were pushing north into North Korea, the army decided not to approve sale of improvements in Areas 10 and 13. It had underway a review of facilities, like Fort Huachuca, that had been disposed of but were subject to recapture in a national emergency. The Department of the Army advised Arizona Senator McFarland that "at such time as it is determined that Fort Huachuca will not be required in the

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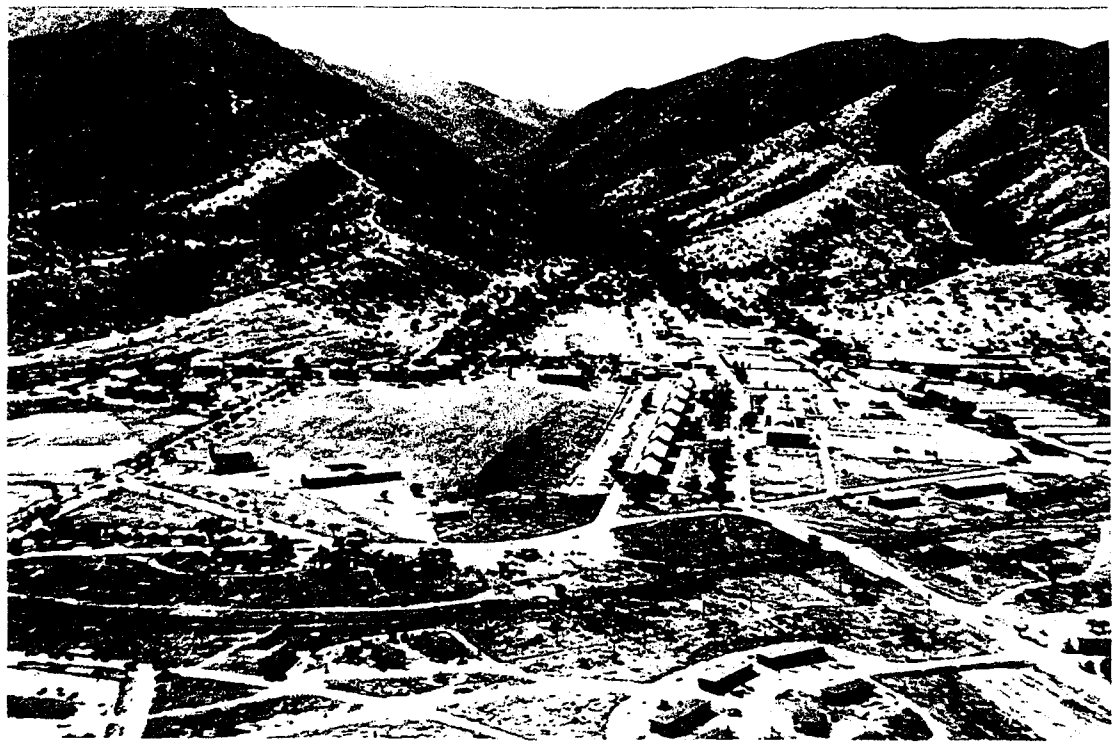
[58]Weighly, ~~*History of the Army*~~ AGF, 506-526.

[59]Bisbee Chamber of Commerce to Hayden, 7-14-1950. Hayden Collection 176:31, Arizona Collection, ASU, 20-0079; Hayden to Bisbee Chamber of Commerce, n.d. Hayden Collection 176:31, Arizona Collection, ASU, 20-0080.

Old Post Reservoir, 1943. WPA installed stone masonry arch during the 1930s.



Aerial view of Old Post area, 1950.

present emergency, the request for permission to sell the improvements in Cantonment Areas Nos. 10 and 13 will be further considered."[60]

As the war grew the military began to grow more interested in reacquisition of the fort. The military held this information, apparently, in confidence. In late November, 1950, the Department of the Air Force requested that the Chief of Engineers prepare a "Lease Planning Report" for the post. "It has been determined that a military requirement exists for the former post and cantonment of Fort Huachuca," wrote the Department of the Air Force real estate representative, "plus approximately 4,000 acres of additional unimproved adjacent land to be used for training purposes." The USAF requested the Corps to have a representative meet with state officials to prepare the report, and assure that the USAF would have the right to construct additional facilities it might require. This request flowed down the chain of command to the Corps Real Estate Field Office in Phoenix.[61]

Ed Atkinson, Chief of the Phoenix Real Estate Field Office, prepared a report on reacquisition of Fort Huachuca and airmailed it to the LAD District Engineer on December 18th. He pointed out that a lease might not be the best avenue for reacquisition. The deed given the state for the AG&FC area had a clear recapture clause, allowing the federal government to reacquire the post by command. The deed for the National Guard area, however, was less certain as to recapture. He reported:

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[60]He also noted that the deed of 3-2-1949 did not clearly define all rights and responsibilities of parties; he cited as an example that the deed "does not specifically set forth the obligation of the State of Arizona in respect to maintenance of the property." Department of the Army to Senator Ernest McFarland (the senator sent a copy to Gov. Garvey), 10-24-1950. Governor's Papers, Box 87, folder 2, ASA, 30-0331; letter to the same effect sent to Hayden, see Hayden Collection 35:35, Arizona Collection, ASU, 20-0177.

[61]Col. C. F. Dreyer, USAF, to Chief of Engineers, 11-27-1950; Chief of Engineers to Division Engineer, SPD, 11-30-1950; LAD to Chief, Phoenix Real Estate Field Office, 12-14-1950. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, .

15-0053
15-0054
15-0055

> There apparently is, strictly speaking, no recapture clause as to the title, as in the deed to the State for the Game and Fish Commission. Paragraph 4, however, provides that the United States shall have the right during the existence of a declared national emergency to unrestricted possession, control and use of the property without charge, with the duty to maintain the premises and to pay a fair rental for any structures added without Federal aid.

Reacquisition would encounter the customary difficulties attendant upon any fee transfer; "a deed would have to be secured from the State of Arizona on the National Guard property." Taking additional federal lands (in the artillery range) would be relatively easy, but acquiring state lands would be "a lengthy procedure." Removing those renting buildings through Fort Huachuca Enterprises would be easy, and some of the service establishments then on the post could be retained under lease.

Atkinson did not believe that a lease would work for the AG&FC area, given that it would require game to be removed, so "leasing precluding use by wild life would appear to cause reversion." However, the National Guard could lease the cantonment to the federal government "with the consent of the Secretary of Defense." He described the guard's use:

> The National Guard has been directed to hold a weekend training program, beginning the 1st of January, 1951, and two weeks encampment in the last half of August, 1951. A heavy weapon company, located at Warren, having 76 men, also uses the range intermittently. The Guard has considerable equipment, including tanks, located on the reservation, this being the concentration center for its equipment in Arizona. The Guard earnestly requests consideration that it be permitted exclusive use of the buildings in Area 7, weekend use of the ranges, and training areas, subject to the approval of the Commanding Officer, and use of the same facilities during the last half of August, 1951 ... The above requests by the Army National Guard are, of course, based on the assumption that the Army National Guard is not inducted.

Atkinson discussed the situation with both the AG&FC and National Guard. Both wanted to have the military use the post by lease, given the trouble they went through to get title under the WAA.[62] In his lease planning report he recommended that the federal government seek a 25 year lease and allowing both agencies use of the reservation if the military did not require exclusive use. Atkinson closed by adding, "it is noted in the morning paper that the President of Fort Huachuca Enterprises, Inc., lessee from the National Guard of buildings in Areas 1 to 6, inclusive, of the reservation, has recommended to Secretary of Defense, that Fort Huachuca be reactivated."[63]

At the same time the Los Angeles District, as ordered by the South Pacific Division engineer, prepared an assessment on "Rehabilitation of Fort Huachuca." The district estimated that it would take 45 days to prepare the post for 5,000 troops to a level of "benefical occupancy," and 180 days for 25,000 troops. Existing facilities would allow for 10,300 troops, so space for another 15,000 would have to be built. In describing the "status of real property," the district interpreted the situation regarding the National Guard area somewhat differently than had Atkinson: "25,472 acres deeded to the State for National Guard use; recommend exercise of recapture clause by letter of notification to the Governor." The AG&FC area could be reacquired the same way, in such a way that the letter to the governor could simply be recorded as proof of recapture. The district engineer also pointed out that the post was supplied by an abundant water supply. "There is sufficient water available from five wells and eight springs to supply normal needs of 60,000 population. However, water service lines and elevated tanks have been disposed of." He

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[62]Ed Atkinson to Los Angeles District Engineer, 12-18-1950. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-00 86

[63]Ed Atkinson, "Lease Planning Report on Fort Huachuca Military Reservation and Portion of Artillery Range," 12-20-1950. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, .

15-00

estimated that it would cost $200,000 to rebuild and install the tanks, and another $30,000 to run new water lines.[64]

The word leaked out about the return of the military to the fort soon thereafter. In late December 1950 Senator Hayden's friend and regular correspondent, newspaper editor Folsom Moore of Bisbee, wrote to report that he had learned from Governor Garvey that the army had reactivation of Ft. Huachuca under consideration. Moore knew that the Sixth Army had some officers at the fort two weeks earlier. "The water supply is ample," he remarked, and other facilities were in place or easily installed. Moore urged that if the post were to be reactivated, all improvements should be permanent and Fort Huachuca set up as a permanent facility.[65]

Within a few weeks the military acted to reacquire Fort Huachuca. On January 18, 1951, John McCone, Acting Secretary of the Air Force, advised Arizona's new governor, Howard Pyle, that the military needed lands covered under the deed dated January 14, 1949 (the AG&FC area).[66] Governor Pyle asked the state National Guard to comment on the McCone letter. Fraser observed that the AG&FC should be advised, and suggested that the state attorney general be contacted regarding compensation or reimbursement for expenditures at the fort since February 14, 1949, and

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[64]Los Angeles District, "Rehabilitation of Fort Huachuca," 12-20-1950. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, . The tanks were saved by reactivation. During state tenure they were sold to Mr. Carl Deckert, who in January, 1951 was in the process of dismantling them. Deckert also had 10,000 feet of 12' and 6,600 feet of 10' pipe and valves and other fittings "piled on the post" that he was taking away. Corps representatives asked that he stop removing the salvage until the government determined if they needed it. Lloyd H. Fitts, memorandum for the record, 1-19-1951. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0091

[65]Folsom Moore to Hayden, 12-23-1950. Hayden Collection 176:31, Arizona Collection, ASU, 20-0081.

[66]Acting Secretary of the Air Force John McCone to Gov. Howard Pyle, 1-18-1951. USCoE Phoenix, Real Estate Office, 0009.

10-0089

regarding disposition of state and personal property at the fort.[67] Soon thereafter Chief Assistant State Attorney General Perry M. Ling warned Pyle that while the deed for Fort Huachuca called for reversion to the US in the event of a national emergency called by congress or the president, he knew of no such announcement. He did not believe that Pyle should voluntarily relinquish all claims to the fort, or state in a letter to the Secretary of the Air Force that "we admit the reversion of the lands to the Federal Government has already taken place."[68]

With Ling's advice at hand Pyle wired McCone, acknowledging McCone's letter and observing that "since our deed specifies reversion to Secretary of Army would like waiver or consent from Army for transfer to Air Force." Pyle asked that McCone have an official from the USAF confer in his office on January 29th or 30th to work out details regarding wildlife and non-military families resident on the post. He also reiterated his desire for cooperation to "facilitate appropriate use these facilities." These meetings were held on January 28th and 29th, and included representatives of the governor, Los Angeles District of the Corps of Engineers, and others.[69]

Secretary McCone wired Pyle the on the last day of the conferences, asking for a letter granting right of immediate entry to Fort Huachuca. He hoped they could work out problems with wildlife soon, and that that issue would not hold up the process. He reiterated the Air Force's desire to be cooperative. Pyle granted the USAF right of entry. By making this grant Pyle did not acquiesce to a transfer of title. "It is our understanding from you and verified by Colonel Fred C. Green of the Office of the Under

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[67]Col. Frank Fraser to Governor Pyle, 1-24-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0295.

[68]Perry M. Ling to Pyle, 1-24-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0304.

[69]Pyle to McCone, 1-25-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0305; Conferences in Governor Pyle's office, see letter of 2-2-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0269.

Secretary of the Army," he reminded McCone, "that the right of entry does not disturb the status of titles of the Fort Huachuca facilities involved. It is understood to imply exclusive use." Pyle hoped that careful consideration be given the AG&FC's request to make arrangements that would avoid having to move the buffalo herd then confined in a remote corner of the reservation. Residents on the post, he added, would have 30 days to move.[70]

The AG&FC was opposed to reacquisition by the military. On January 29th AG&FC director Kimball urged Governor Pyle instead that the state provide the Air Force a lease. Kimball noted that the commission had made expensive improvements, including fencing, corrals, and watering devices, and if title was to revert to the federal government the commission would present an itemized list for payment. They wanted to preserve the buffalo and antelope ranges in particular. Kimball also noted that senators Hayden and McFarland "saw no reason" why the Air Force could not get what it wanted through a lease. Pyle was non-committal in his reply.[71]

The military, however, did not intend to simply lease the post back from the state, and various branches of the military cooperated on the effort to reacquire the fort. McCone's letter was followed by word from Under Secretary of the Army Archibald S. Alexander, who advised Pyle:

> at the request of the Air Force the Department of the Army has agreed to the Air Force securing an immediate right of entry and to temporary occupancy of Fort Huachuca. This does not mean able [sic] transfer of title at this time. The Department of Army will also have able [sic] requirement for Fort Huachuca in the near future and therefore

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[70]McCone to Pyle and Pyle to McCone, 1-29-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0292; Pyle to McCone also in SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0093

[71]J. V. Hulse to Kimball, 12-29-1950. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0090; Kimball to Pyle, 1-29-1951, Pyle to Kimball 2-2-1951. Governor's Papers, Box 77, folder 2, ASA, 30-0081.

> the ultimate use of the installation and which service will acquire title will be worked out between the Army and the Air Force at an early date.[72]

Nevertheless, Pyle continued to press for a lease rather than reversion of title. After receiving Alexander's letter Pyle told Col. James Barnett, USAF Liaison Officer to the Southern Pacific Division, US Corps of Engineers in San Francisco, that the state wanted a lease to speed the fort's return to the state after the war. "It would be our desire that the lease stipulate automatic return to the state and its subdivisions once the emergency is declared at an end and Armed Forces emergency use of the facilities is terminated." Barnett was sympathetic and urged his superiors to lease the fort. He noted that there is "evidence, on the part of the state, [of] reluctance to accept title revestment, and, on the part of the United States, no firm or final determination to seize title. On the other hand, the fully cooperative spirit and attitude of the State of Arizona is apparent." Barnett reported the state would lease the fort back to the federal government, a tactic that might solve the problem and be a public relations coup for the military. Barnett informally advised Pyle that the USAF had decided to lease rather than recapture the post.[73]

The AG&FC was faced with the problem of relocating herds of buffalo and antelope, and decided to request a lease from the army of 13,000 acres

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[72]Under Secretary A. S. Alexander to Pyle, 1-30-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0267.

[73]Pyle to Col. Barnett, 1-31-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0303; Barnett to USAF Director of Installations, Deputy Chief of Staff, HQ, Washington DC, Chief Liaison Officer, Col. Ralph O. Brownfield, 2-2-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0269; Barnett to Pyle, n.d. Governor's Papers, Box 82, folder 2, ASA, 30-0269. At the same time, Col. Frank Fraser of the Arizona National Guard advised John Pintek, president of Fort Huachuca Enterprises, that the governor had granted the USAF, as of 2-1-1951, right of entry to the post. He advised that military authorities wanted the premises vacated by February 28th. Fraser to Pintek, SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0094

on the northwest side of the post.[74] This became more pressing when the state failed to get the army and Air Force to use Fort Huachuca as it wished. On March 5, 1951, Under Secretary of the Army Alexander advised Pyle that the army had decided to reacquire title and reoccupy Fort Huachuca. "This will be done in such a manner," assured Alexander, "as to cause a minimum of disruption to the activities now conducted by the State of Arizona."[75] Similarly, Col. Francis Shearer of the National Guard Bureau advised the Arizona National Guard Adjutant General, Frank Fraser, that the Air Force planned to turn the post over to the army. This decision arose out of a meeting between the army, Air Force, and the vice chairman of the Munitions Board on March 2nd. The Air Force would vacate Fort Huachuca no later than May 15, and "the Department of the Army would acquire and reactivate the installation."[76]

Governor Pyle suggested three alternative ways of dealing with the commission's activities on the post with army's plans to reacquire and reoccupy. First, Pyle asked that the army requisition the area held by AG&FC under a lease to allow an isolated portion of the post to be used by the buffalo herd. When the army left Fort Huachuca it could automatically

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[74]AG&FC to Secretary of the Army, 2-14-1951. Governor's Papers. Box 77, folder 2, 30-0059; see letter Yoder to Dunn, 5-26-1953. In June of 1951 the AG&FC reported to the governor on "Fort Huachuca Wildlife Area Investigations." This report summarized work done since 1949, which focused on a floral and faunal inventory, reintroduction of species, etc. With the reactivation of the fort the program was curtailed, but the the commission believed that the command at the fort recognized the value of wildlife studies. "Some of the program is being continued, and the originally planned investigation can be readily reactivated when the area is no longer required for military purposes." Charles O. Wallmo, Wildlife Restoration Division, Arizona Game and Fish Commission. Fort Huachuca Wildlife Area Investigations. June 30, 1951, forward.

[75]Alexander to Pyle, 3-5-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0277.

[76]Col. Francis B. Shearer, NGB, to Col. F. Fraser, Arizona National Guard, 3-6-1951. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office,

15-0098

be returned to the state or AG&FC without prolonged negotiations. Second, if the first option was not possible, Pyle asked that the army leave the state in possession of the buffalo area while the army took the rest. Third, if neither were possible he wanted Alexander to explain "what you mean in your telegram when you say 'this will be done in such a manner as to cause a minimum disruption to the activities now conducted by the State of Arizona.'" Pyle observed that the buffalo and antelope were in a remote location and likely would have to be slaughtered on the spot. However, he reiterated the state's desire to help. "Arizona is looking forward to the Army's return to Fort Huachuca. You will find us ready and willing to do everything possible to facilitate your reactivation of this historic, old post."[77]

Officials of the state were confused as to exactly when the title for Fort Huachuca passed from the state to the federal government. Pyle asked Hayden to get an explanation from the army: did it all revert as of the date McCone wrote his letter? McCone told Pyle (in response to Pyle's letter of January 29, 1951) that title to that portion under the deed dated January 14, 1949 reverted to the government by virtue of his letter of January 18, 1951; the army had the right to unrestricted use of the remainder, as specified in the deed dated April 18, 1950 (the corrected deed).[78] The Sixth Army, through General Order No. 62, designated the fort a Class I military installation effective April 20, 1951. The USAF turned the post over to the army in March.[79]

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[77]Pyle to Alexander (based largely on a letter from AG&FC director Kimball, dated 3-14-1951) ~~3-7-1951.~~ Governor's Papers, Box 82, folder 2, ASA, 30-0273; no formal version is in the file, so it is not certain he sent this letter.

[78]Pyle to Hayden, 3-16-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0282; McCone to Pyle, 3-27-1951. Governor's Papers, Box 82, folder 2, ASA, 30-0285.

[79]Col. W. W. Ragland, Executive Officer, LAD, to Commanding General, Sixth Army, 5-11-1951. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office,

15-0102

In June the William M. Curran, an attorney in the Acquisition Section of the Corps Real Estate Division, explained to the district engineer the status of land at Fort Huachuca. Curran agreed that the AG&FC area had reverted to the government by virtue of McCone's letter of January 18th. However, like Atkinson had earlier, Curran stated that the cantonment area was "recaptured for use only by the Government," and that "title remains in the State of Arizona." Other lands, like the cemetery, stayed in the hands of the state, but the artillery range reverted for military purposes to the federal government.[80] Three days later Fred Johnston, chief of the Acquisitions Branch, Real Estate Division, advised the Phoenix Real Estate Field Office that while title had reverted by McCone's letter, the cantonment and other areas were controlled for use only. He pointed out that Multiple Letter of 4 May 1951, ENGIS 601.53 (General) provided guidance as to form of deeds from former owners to the federal government. Johnston was mostly concerned with buildings that the army was using but for which title remained with the state.[81]

The army at this time would still have been satisfied with a lease to the cantonment area. On June 19th, William Cupples, Chief of the Los Angeles District Real Estate Branch, advised the Chief of Engineers that "pursuant to prior instructions of your office, steps are being taken by the Los Angeles District Engineer to secure a quitclaim deed from the State of Arizona covering that portion of the installation recaptured in fee, and negotiations are in progress for the purpose of formalizing a leasing agreement with the State of Arizona covering that portion of the

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[80]William M. Curran, Jr., to District Engineer, "Acquisition of State Lands at Fort Huachuca," 6-5-1951. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, .15-0107

[81]Fred H. Johnston to Chief, Phoenix Real Estate Field Office, 6-8-1951. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, .
15-0108

reservation wherein the use and possession only was recaptured."[82] However, the situation changed in August, 1951. The Los Angeles District had requested a status report on the lease; Ed Atkinson of the Phoenix office reported that the state was leaning toward deeding the entire fort back to the federal government. The governor told him that, in his opinion, "all action toward execution of such an agreement would be deferred until the meeting of the Legislature, at which time the matter of deeding the entire installation, Ft. Huachuca Military Reservation and Artillery Range, will be taken under consideration by the Legislature." Atkinson's report was sent on to the Commanding General of the Sixth Army as well.[83]

Atkinson's intelligence about the state's position was correct. Col. David Dunne, CE, commander at Fort Huachuca, informed the Commanding General, Sixth Army, that following an appearance by two of his officers before an interim committee of the state legislature, that committee voted unanimously to recommend that the next session pass enabling legislation to affect a transfer of lands held by the military for use but in which the state held title.[84] The state acted quickly, passing Chapter 44, House Bill 170 (by Mr. Morris of Cochise County) and signed by the governor on March 13, 1953. By this act the legislature authorized the governor to "convey to the United States for the use and benefit of the army, title to all real and personal property comprising Fort Huachuca,

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[82]William E. Cupples to Chief of Engineers, 6-19-1951. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0109

[83]Ed Atkinson, acting Chief, Phoenix Real Estate Field Office, to LAD District Engineer, 8-1-1951; Col. W. W. Ragland to Commanding General, Sixth Army, 8-9-1951. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0110, 15-0113

[84]Col. David Dunne, CE, to Commanding General, Sixth Army, 1-14-1952. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0121

including the artillery range."[85]

Harold E. Spikard, Chief of the LAD Real Estate Division advised the division engineer that with the passage of HB 170, the state had the power to deed back the post, but he did not known what action the governor would take. The Corps had sufficient authority to recapture the AG&FC portion, and to work out an agreement with the state for the remainder that it controlled by right of entry. However, Spikard recommended that, given the large amount of money spent by the government at the post since 1951, that his office be authorized to negotiate for acquisition of all real estate and personal state-owned property "required for the reactivation of Fort Huachuca which has not been acquired by the Government under the provisions of the deed of 14 January 1949."[86]

The AG&FC continued its application for a lease to a portion of the post as soon as it learned that the military planned to reoccupy the area. By October 1951 it had gotten approval from the Arizona Attorney General as to the form of a lease between the US and the commission for 13,120 acres of Fort Huachuca, for five years use as a "Wildlife Refuge." The lease included specific land use provisions. Among these were specifications for pothole water developments for animal watering. Attached to the lease was a diagram showing a pothole capable of holding 90,000 gallons when leveled two feet below adjacent stream bed. Slotted pipes were to take flows to the pothole, each about 20' x 30' x 10' deep. High flows during flood would be captured in an open ditch.[87] However, state

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[85]State of Arizona, House of Representatives, 20th Legislature, 2nd Regular Session, H.B. 170; 1st Lt. J. F. Kaylor, Adjutant, Fort Huachuca, to Phoenix Real Estate Field Office, 5-26-1952. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0123

[86]Harold E. Spikard to Division Engineer, South Pacific Division, 5-27-1952. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0124

[87]Attorney General's Office to Governor, 10-23-1951. Governor's Papers, Box 82, folder 9, ASA, 30-0203.

authorities advised the Secretary of the Army that they signed "under protest" and suggested amending the lease to "provide for an indefinite period of occupancy to continue until such time as the wildlife thereon is found entirely incompatible with military operations." The state based its protest on six specific reasons, including the assertion that the AG&FC "formally acquired title to Fort Huachuca Military Reservation in 1945 under the terms of Public Law 537, and has occupied the reservation since that time for the purpose of restoring, propagating and conducting research projects on the various Arizona wildlife species, until recapture of the title by the Army." They also noted that the state spent over $25,000 on development and maintenance, another $13,600 for research, surveys, investigation projects, and $15,500 for "water developments and buffalo corral."[88]

Active or inactive, the post was firmly in federal hands, so the AG&FC pressed its efforts to continue projects begun in 1949. In May 1953 Director A. W. Yoder of the AG&FC asked Col. D. M. Dunn for a lease on a 22,000 acre area of the post south of the commission's pending requested lease of the northwest corner. Most of the land was mountainous, with 7,000 acres of grasslands. Yoder noted that "during the two year tenure of the Fort by the Arizona Game and Fish Commission [1949-1951] considerable land improvement work was accomplished in the form of completely fencing the reservation, over half with page wire, additional watering facilities, cross fences, pastures, large corrals and the repair and maintenance of five dwellings subsequently used by military personnel." The commission was ready to initiate additional improvements "such as wells, earthen tanks, fencing and any other developments where needed."[89]

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[88]AG&FC to Secretary of the Army, Governor's Papers, Box 82, folder 9, ASA, 30-0204; Governor Pyle signed the protest letter on 12-3-1951. Governor's Papers, Box 76, ASA, 30-0209.

[89]A. W. Yoder to Col. D. M. Dunn, 5-26-1953. Governor's Papers, Box 77, folder 2, ASA, 30-0059. Yoder's successor, John M. Hall, made similar comments in a letter to S. C. Farrington on 2-4-1954, as the Army began the process of reacquiring the remainder of the post. See Hall to Farrington, 2-4-1954, 601.1 Fort Huachuca, AZ. RE-D 6752, USAEPG Additional Lands, Box 21. Corps of Engineers, Arizona Real Estate Office,

15-0145

In August 1954, AG&FC Director Yoder sent Pyle the "long awaited lease on the 13,120 acres of Ft. Huachuca for buffalo range." The lease ran for 25 years but was revocable by the army at will. It covered the northwestern corner (13,120) acres of the fort. The army inserted a number of specific conditions. Condition 21 reserved to the US the right to construct or have constructed facilities for utilities, including water supply. The lease also included land use provisions, of which #8 stated "it shall be the privilege of the lessee to drill and improve wells, and to improve any springs or washes so as to make additional water available for fire fighting and grazing purposes." Provision #9b (1) through (5) specified range improvements, including drilling two wells, fencing all completed water facilities, constructing not less than two "pot hole" water developments, maintaining or enlarging and repairing nine reservoirs (No. 1 at Kino Springs, No. 2 at Sycamore Gulch, and No. 3 High Line Tank, No. 4 Toboma Wash, No. 5 Blacktail Wash, No. 6 and No. 8 Gravel Pit Wash and North Gate Tank, No. 7 Northeast Tank, and No. 9 Laundry Ridge Tank).[90]

During the Korean War the army used the post to train aviation engineer units for duties in and around airfields, but by August 1952 the need for such units declined. Fort Huachuca headquarters complained to the Phoenix Real Estate Field Office that nothing had been done to "expedite the reconveyance of the Fort Huachuca Military Reservation to the United States for use of the Army." They demanded an explanation, noting that it seemed that no agency of the federal government had expressed any interest since the passage of HB 170. Fort Huachuca asked the commanding general of

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[90]Yoder to Pyle, 8-13-1954. Governor's Papers, Box 77, folder 2, ASA, 30-0061. The state attorney general's office found the lease correct as to form on 8-31-53. A copy of the lease is included [30-0062].

the Sixth Army to push the Phoenix Office.[91] The decrease in activity worried Hayden, who asked the Secretary of the Army to explain the army's plans for the post. On August 26, 1952, Karl R. Bendetsen, Acting Secretary of the Army, explained that reduced demand for engineer units would mean that as the last one was shipped out, the fort would not be required. The army, however, would evaluate it in light of potential uses by other units. "As a result of the Korean situation, which necessitated the reactivation of Fort Huachuca, some 48,800 acres of land [of the 76,500 acres used during WWII] were recaptured from the State of Arizona. Some $5,900,000 were expended for the rehabilitation of this facility." Bendetsen assured the senator that the army was well aware of the post's value; "therefore, there is no plan to declare this facility surplus to the requirements of the Army, and it will be retained for possible future use."[92]

Soon thereafter Governor Pyle pressed General Maxwell Taylor as to the future of Fort Huachuca. "It is rumored here and not exactly without foundation," Pyle noted, "that the Department of the Army intends to put this installation on an inactive status sometime around January 1st." He extolled its location and history, and added that when the army transferred it to Arizona, the state did its best to "convert it to general usefulness by a variety of means."

> In the course of this interlude, the facilities were to a very large extent pretty much dismantled on the assumption that in all probability it would never again be activated. Then all of a sudden, we were requested to surrender title, and the Army proceeded to invest more than eleven million dollars in completely rehabilitating the plant. The idea behind the effort was to restore it to more or less complete usefulness.

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[91]Floyd Curry, acting adjutant, to Phoenix Real Estate Field Office, 8-7-1952. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, . 15-0125

[92]Karl R. Bendetsen to Hayden, 8-26-1952. Hayden Collection 176:31, Arizona Collection, ASU, 20-0086.

With the rumors of the fort being returned to an inactive condition, the state did not know what to do. "We would like to see the installation continue to be active ... At the moment, no one seems to be able to figure out what comes next, if anything."[93] General Taylor told the governor that the army had Fort Huachuca's future under study; but the units that had been trained at the post were no longer required. "I know you will realize that requirements for installations do not always remain constant," and that the army sought most economical and efficient use of its facilities. "If you find out a single thing that might be useful to us here," Pyle asked General Taylor, "please wire me as quickly as possible. Our southern Arizona counties are tremendously upset over the possibility that Huachuca may be abandoned for a second time."[94]

Like Pyle, Senator Hayden questioned Frank Pace, Secretary of the Army for information regarding Fort Huachuca's future. Hayden mentioned Bendetsen's letter of August 26th, but also noted that he and Senator McFarland had been "greatly embarrassed by statements given the Arizona newspapers by the Governor of our State to the effect that the Department of the Army does not intend to arrange for training any kind of troops at Fort Huachuca after the last of the aviation engineer units have departed. We are therefore anxiously awaiting word from you that a way has been found to at least fully utilize the existing facilities at that place for training purposes." Pace assured Hayden that the department realized that Ft. Huachuca was a splendid investment, and that they had underway studies related to its future use. Consideration would be given "all factors which

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[93]Pyle to General Maxwell Taylor, 9-2-1952. Governor's Papers, Box 82, folder 2, ASA, 30-0288.

[94]Taylor to Pyle, 9-13-1952, 9-22-1952, Governor's Papers, Box 82, folder 2, ASA, 30-0287, 30-0286.

may have a bearing on the future use of Fort Huachuca."[95]

While the senator and governor corresponded with army leaders, at the state level more prosaic actions were underway. On October 2, 1952, S. C. Farrington of the Phoenix Area Real Estate Office, LAD, informed Pyle that the office was in the middle of producing a planning report for Fort Huachuca. Farrington noted that under HB 170 Pyle was given authority to transfer Ft. Huachuca back to the US. "In order to have full information for this Planning Report, it is requested that, if possible, you state whether or not you can make a commitment to be included in the Planning Report that you will execute a Quit Claim Deed to the United States, if so requested by the Department of Defense." He later repeated his request, asking for a quick response because their report had a upcoming deadline. Pyle informed Farrington on October 22, 1952, that the State would execute a quitclaim deed for the fort "providing the United States of America, desires the retaining of Fort Huachuca, Arizona, as an active installation."[96]

At the end of October, 1952, it seemed the state would obtain the assurances that the post would be retained as an active facility. General Taylor sent Pyle copies of a telegram sent to senators Hayden and McFarland by Frank Pace, Jr., Secretary of the Army, stating: "After careful consideration of the facilities generally available to the Army, it has been determined that Fort Huachuca will be maintained on an active status."[97] Nevertheless, its future remained uncertain, and as the Eisenhower Administration took office the political landscape in

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[95]Hayden to Frank Pace, Secretary of the Army, 9-22-1952. Hayden Collection 176:31, Arizona Collection, ASU, 20-0087; Pace to Hayden, 10-15-1952. Hayden Collection 176:31, Arizona Collection, ASU, 20-0096.

[96]S. C. Farrington, Phoenix Area Real Estate Office, LAD, to Governor Pyle, 10-2-1952, 10-17-1952. Governor's Papers, Box 77, folder 2, ASA, 30-0073; Pyle to Farrington, 10-22-1952. USCoE Phoenix, Real Estate Office, ~~0021;~~ see also Governor's Papers, Box 77, folder 2, ASA, 30-0071.
15-00260

[97]General Taylor to Pyle, 10-28-1952. Governor's Papers, Box 82, folder 2, ASA, 30-0291.

Washington changed as well. At the same time, Arizonans replaced Senator McFarland with Barry Goldwater, whose views on Fort Huachuca were not as positive as his predecessor's. In February 1953, T. A. Young, special assistant to the secretary of the army, advised Senator Goldwater that the army had not yet taken a position on Fort Huachuca's future, as the army still was studying post war needs. He noted that the army had an authorized strength of 1.6 million (down 1.2 million from its Korean War peak), so the need for training facilities had decreased. He assured the new senator he would be contacted as soon as a decision was reached.[98]

In March news began to leak out of Washington that the post would be put into inactive status. Brig. Gen. Frank Fraser of the Arizona National Guard advised Senator Goldwater that he believed a conference should be held between the army, the state, and other interested agencies to straighten out the matter. Since hearing that the post might be deactivated the governor, Goldwater, and others had been inundated with petitions, delegations and complaints from citizens, particularly those in southeastern Arizona, who had counted on it remaining active. Despite enabling legislation passed by the state, it seemed to Fraser that the Defense Department or its agencies had made no effort to accept Fort Huachuca. "The non-acceptance, perhaps, is one of the reasons why Fort Huachuca, Arizona, is not set up as a continuing active military installation."[99] The *Tucson Citizen* announced that the army planned to put Fort Huachuca in stand-by status on June 1st. It was not being abandoned, and would be returned to service if needed. Representatives of the army met with the Arizona congressional delegation in Hayden's office. "The Arizona delegation said it had no plans to oppose the closing," reported the *Citizen*, "because the army had explained the six posts affected are

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[98]T. A. Young to Senator Barry Goldwater, 2-18-1953. Hayden Collection 176:31, Arizona Collection, ASU, 20-0097.

[99]BG Frank Fraser, Az NG, to Senator Barry M. Goldwater, 3-2-1953 SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, . 15-0127

the least essential to its current mobilization program."[100] Still, the vision of it standing idle was disagreeable to the state legislature. The state senate passed a memorial on March 25th urging the president and congress to take whatever action necessary to retain Fort Huachuca in active status. The senators pointed out the uneconomical nature of rehabilitating and then abandoning "one of the best in the Nation." Why spend millions on training facilities elsewhere, they wondered, when a fine one existed in southern Arizona?[101]

Maj. Gen. Miles Reber explained to Hayden why the fort was being placed in an inactive status. It was not then needed for training, and army budgets for operation and maintenance had received a 10% cut. "Fort Huachuca would be reactivated only in the event of increased troop strength or the redeployment of our present strength which would result in a substantial increase in the number of personnel stationed in the continental United States."[102] Nevertheless, Hayden sought some means to keep the post open and was heartened to hear later in April that the Signal Corps was interested in Fort Huachuca, news confirmed to him by a source in the Pentagon.[103] Hayden learned that in the last two months

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[100] *Tucson Citizen*, 3-18-1953. Hayden Collection 176:31, Arizona Collection, ASU, 20-0089.

[101] Arizona State Senate Memorial No. 4, 3-25-1953. Hayden Collection 176:31, Arizona Collection, ASU, 20-0101.

[102] Maj. Gen. Miles Reber to Hayden, 4-1-1953. Hayden Collection 176:31, Arizona Collection, ASU, 20-0102.

[103] Hayden to Folsom Moore, 4-9-1953, Moore to Hayden 4-9-1953. Hayden Collection 176:31, Arizona Collection, ASU, 20-0103-0104. Moore sent Hayden a clipping, and copy of a letter written by Barry Goldwater that indicated Goldwater believed the fort to have been reactivated in 1951 "in an effort to same a certain candidate's [McFarland?] political life." Goldwater believed its inactivation in 1953 was justified under budget restraints. At the time, however, Goldwater was a junior senator, while Hayden was one of the Senate's most influential members. The *New York Herald Tribune* judged in 1960 that "Sen. Hayden's power in the Senate vis a vis Sen. Goldwater's is as a hydrogen bomb's to a water pistols." Quoted in Charles C. Colley, "A Study of Power Carl Hayden and the

officers of the Signal Corps had thoroughly assessed its facilities. "I am told from a most reliable source," wrote Folsom Moore, "that they want to make Huachuca a Class II installation which will take it out of the jurisdiction of the 6th Army and make it directly under the Chief Signal Officer." Moore added, "Please do whatever you can. This seems the best opportunity we have ever seen come our way."[104]

The interest of Signal Corps was not enough, at least in 1953, to keep the post on the active list, and on June 1, 1953, the army announced that Fort Huachuca had been placed on a stand-by status. Hayden was disappointed. Special Assistant to the Secretary of the Army T. A. Young told Hayden that the Signal Corps already had three major installations, so "no current requirement exists for the establishment of Fort Huachuca for Signal Corps activities." Young added, "Fort Huachuca will be maintained on a standby basis for possible future use by the Department of the Army and will be utilized for civilian component training as required." This was reiterated by Lt. Gen. Joseph W. Swing, commanding officer of the Sixth Army, who denied that the army "has any intention of abandoning Ft. Huachuca or disposing of its land or facilities," rather, the army had plans "to maintain the property so that it could be rapidly reactivated should conditions so require."[105]

Development of Southwestern Agriculture, 1912-1968," in *Southwestern Agriculture, Pre-Columbian to Modern*, Henry C. Dethloff and Irwin M. May, ed. (College Station, Texas: University of Texas Press, 1982), p. 245.

[104]Moore to Hayden, 4-12-1953. Hayden Collection 176:31, Arizona Collection, ASU, 20-0107.

[105]T. A. Young to Hayden, 6-18-1953. Hayden Collection 176:31, Arizona Collection, ASU, 20-0109; Lt. Gen. Joseph W. Swing to Hayden, 8-15-1953. Hayden Collection 176:30, Arizona Collection, ASU, 20-0069, 20-0070; *Douglas Daily Dispatch*. Swing said, "its actual use when reactivated would depend on the circumstances existing at the time, but full use would unquestionably be made of the splendid training afforded by the varied terrain and mild climate."

Despite the army's reoccupation and control of the fort in 1951, by fall of 1953 the state still had not quitclaimed title back to the federal government for the entire fort as it was in WWII. The Headquarters of the Sixth Army requested action from the South Pacific Division engineer, noting that the fort was deactivated but still in the army's long-range plans. This request flowed down the chain of command to the Phoenix Real Estate Field Office. Real Estate officer S. C. Farrington again wrote Governor Pyle regarding the state's position on transferring the fort back to the US. He reviewed their correspondence of October 1952, adding:

> During the interim while a study has been progressing on the situation at Fort Huachuca, Fort Huachuca has been declared inactive because of the current world situation rather than being declared surplus. Various approvals have been secured to the United States taking this land assuming the State of Arizona is willing to donate the same and the correspondence has been returned to our San Francisco office for forwarding to our Office of Chief of Engineers in Washington.

The Sixth Army, he advised, made Fort Huachuca inactive, but included it the army's Installation Program "with a long range mission." Farrington wished to know if Pyle could make the same commitment regarding the quitclaim given that now "the fort is in an inactive status and its future use not presently foreseeable."[106] Pyle asked his aides to comment. Arizona National Guard Adjutant General Frank Fraser was concerned about the changes mentioned in Farrington's letter -- that the fort was inactive, its future use unforeseeable, but within some unspecified long range mission; and he wondered whose approvals had been secured. "I would not change your letter of 22 October 1952," advised Fraser, "unless it

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[106] L. M. Shaw, Asst. AG, Sixth Army, to South Pacific Division Engineer, 9-26-1953; F. D. Duncan, Acting Chief, Real Estate Division, SPD, to District Engineer, LAD, 9-30-1953; L. B. Otterness, Chief, Appraisal Branch, Real Estate Division, LAD, to Chief, Phoenix Real Estate Office, 10-2-1953; all in SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, ; S. C. Farrington to Governor Pyle, 10-6-1953.

(15-0128, 15-0129, 15-0130)

would be to add the words 'or inactive' after the word active, so it would read 'active or inactive installation.'"[107]

Permanent Reactivation, 1954-1957

Despite earlier word that the Signal Corps was not going to get Fort Huachuca, on January 7, 1954 the Department of Defense announced that the post had been designated the U.S. Army Electronic Proving Ground (USAEPG). The post would provide the Signal Corps with more space for tests and aviation activities. The post was selected "as the only suitable and economical site of the many studied."[108]

The news spread quickly. The *Phoenix Gazette* announced that Ft. Huachuca would be reactivated on February 1, 1954. The paper noted that the post had been on stand-by with a few officers and less than 100 civilians as caretakers. Hayden took little credit for the announcement. "Sen. Carl Hayden (D-Ariz) said the Arizona delegation has been seeking some way to retain use of Fort Huachuca by the army," but that "today's announcement was 'a surprise to all of us.'"[109]

Southeastern Arizona's other papers published accounts of the fort's reopening in the days that followed, and provided more detail on the army's plans. The *Bisbee Daily Review* announced that the fort would employ at first 7500 military personnel and 1000 civilians. The move of the USAEPG from Fort Monmouth, NJ to Ft. Huachuca was the result of long study by the army, which looked for an area free of electronic interference and with available space and facilities. The *Douglas Daily*

Governor's Papers, Box 77, folder 2, ASA, 30-0070.

[107]Pyle to Arizona NG Adjutant General Frank Fraser, 12-11-1953. Governor's Papers, Box 77, folder 2, ASA, 30-0068.

[108]Press release from the Department of Defense, 1-7-1954. Hayden Collection 176:30, Arizona Collection, ASU, 20-0115.

[109]*Phoenix Gazette*, 1-7-1954. Hayden Collection 176:30, Arizona Collection, ASU, 20-0065.

Dispatch published several articles that noted cooperation between Arizona leaders at state and federal level that led to reactivation, and rejoiced at the prospect of resuming commercial ties with the fort. It also noted that at the time only 51 persons were on duty, of which only two were officers; but the fort was in good condition and ready to receive troops. The military had restored water lines and other utilities to "former operating efficiency, when they served more than 20,000 troops" durng WWII. The *Southwest Veteran* (an American Legion newspaper) quoted Governor Pyle: "this is the culmination of a tremendous amount of work on the part of Arizona's entire congressional delegation, state and civic officials." At the time there were 1156 buildings on the post; the paper reminded its readers that in 1931 Fort Huachuca was considered one of the most modern posts in the country.[110]

Perhaps with the news that the fort would provide a home for the USAEPG, the state and the army acted to finally clear up ownership questions regarding the cantonment area. On January 24, 1954, Governor Pyle held a conference in his office, attended by Col. Arthur Frye, LAD engneer, Harold Spikard, a representative of the Signal Corps, and a member of the Phoenix Real Estate Field Office. Representing the state, besides Pyle, were Fraser, Robert Pickerell (assistant to the Attorney General), and two members of the AG&FC. Their aim was to hammer out what was required to transfer the real and personal property at the post to the army. Pyle stated that he was ready to sign a quit claim deed; but wanted assurances regarding future use by the Arizona National Guard, and continued use of a portion of the post for the AG&FC's buffalo. Transfer of the cemetery was of no controversy. The army maintained that the buffalo could stay in a remote portion of the post, and that the National Guard could be

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[110] *Bisbee Daily Review*, 1-8-1954. Hayden Collection 176:30, Arizona Collection, ASU, 20-0053; *Douglas Daily Dispatch*, 1-8-1954. Hayden Collection 176:30, Arizona Collection, ASU, 20-0068, 20-0069, 20-0070; *Southwest Veteran*, 1-14-1954. Hayden Collection 176:30, Arizona Collection, ASU, 20-0066.

accommodated as well.[111] Upon receiving records of the conference, the South Pacific Division advised the Chief of Engineers that real property at Fort Huachuca would be transferred by a quitclaim deed; personal property might be best transferred by a bill of sale. Furthermore, the state seemed willing to work out an equitable solution regarding the state lands in the artillery range.[112]

Fort Huachuca became a "Class II permanent installation" when the army designated it the Army Electronic Proving Ground, rather than a Class I post under the command of the Sixth Army. Brig. Gen. R. S. Moore, special assistant to the Secretary of Defense, advised Hayden that although the fort was not yet a permanent post, "immediate steps are now being taken to so designate it. Personnel are being assigned to Fort Huachuca to carry out the new missions." The army specified that "the mission of the Proving Ground at Fort Huachuca is to provide facilities for developing operational doctrine, procedures and techniques for communication systems and equipment, and to serve as a testing ground for the army's electronic warfare and battlefield surveillance techniques and equipment. It also conducts combat operations research in communications, and Signal Corps aviation activities."[113]

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[111]Herman C. Autenrieth, "Memorandum Report of Conference Held in the Office of the Governor of the State of Arizona, Subject: Reacquisition of Title to Fort Huachuca, Arizona." 1-29-54. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, 15-0131 . In fact, the governor called this conference only after receiving a hand-carried copy of a newspaper item announcing the establishment of the USAEPG. S. C. Farrington to Los Angeles District Engineer, 2-2-1954. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, . 150132

[112]Col. Lionel R. Ingram, Executive Officer, LAD, to Chief of Engineers, 2-8-1954. SPL 601.1 Fort Huachuca, AZ. Correspondence - General, Reactivation 1950-53, Box 61. Corps of Engineers, Arizona Real Estate Office, . 15-0134

[113]The USAEPG will be discussed further in the final chapter of this report. "Fort Huachuca, Arizona," n.a., fact sheet ca. 6-30-1956. Hayden

With the fort reactivated and in the process of being repopulated, new housing came under consideration. In April 1954 Brig. Gen. T. A. Carter, Chief, Service Division, advised Brig. Gen. Moore that the General Staff was "currently processing a request to establish Fort Huachuca as a permanent Class II installation under the jurisdiction of the Chief Signal Officer." Until this occured it would not be possible to get housing projects under the Wherry Act, which provided funds for military housing units (known as "Wherry Units").[114]

The army moved to acquire the title for the central, built-up portion of the post. In May 1954 Col. Robert J. Kasper, Chief, Services Branch, wrote the Chief of Engineers to report that, based on recommendations of Chief of Staff and his aides, a military necessity existed for permanent acquisition of lands required for reactivation of Fort Huachuca and for the USAEPG. The army wanted 14,978.12 acres, including in addition to the Old Post all of sections 15, 16, 22 and 27, and portions of sections 8, 9, 10, 17, 20, 21, 28, and 33, in T21/R20 GSRM, and portions of unsurveyed townships 21 and 22, ranges 19 and 20 east GSRM. Of this land, 13,858.72 to be acquired fee-simple from state by donation; 960 from public domain; and 160 acres exchanged for state school lands.[115]

By the end of May a seemingly exasperated Governor Pyle demanded an explanation from the GSA's Robert Bradford -- why the state had not received documents placing the federal government in complete control of Fort Huachuca? Pyle had been promised these documents at the end of January. He noted that the state had "completely disavowed interest in retention of any portion of the property and most positively want it to be

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Collection 563:10, Arizona Collection, ASU, 20-0030; BG R. S. Moore to Hayden, 4-23-1954. Hayden Collection 176:30, Arizona Collection, ASU, 20-0058.

[114]BG T. A. Carter to BG R. S. Moore, 4-26-1954. Hayden Collection 176:30, Arizona Collection, ASU, 20-0057.

[115]Col. Robert J. Kasper to Chief of Engineers, USA, 5-24-1954. USCoE Phoenix, Real Estate Office, ~~0022.~~

11-0026

fully in military use and control."[116] By this time it was out of Bradford's hands; the Phoenix Corps office was in charge.[117]

However, straightening out the transfer took time. On June 22nd, S. C. Farrington of the Corps Phoenix Real Estate Office wrote Pyle that his office had received a directive (RE-D 5885) on June 15th "directing that this office acquire by donation from the State of Arizona approximately 13,858.72 acres of land comprising the building area on the main post and approximately 3,375.31 acres directly east of the main post in the western part of the old artillery range." The Corps discovered that the actual acreage was 13,918.11. Farrington wanted Pyle to designate someone in his office with whom to coordinate.[118] Farrington circulated a draft of the proposed quitclaim deed in late July, noting that "it is the opinion of General Fraser that deed should specifically include the provision 'Land together with all improvements thereon' in order that title to the 1,164 buildings, water sewer, electric and other facilities, as conveyed to the State of Arizona by deed dated 2 March 1949 and correction deed dated 18 April 1950, be revested in the United States."[119]

On September 9, 1954, the state signed a quitclaim deed for a portion of the fort. The deed set forth the area affected by describing the borders of the May 14, 1883 Executive Order reservation, then excepting all lands north, west, and south of the built-up portion of the post (see map). It also granted a portion of the East Range in T21S/R20E, G&SRB&M. The state acted under provision of Chapter 44, House Bill No. 170,

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[116]Pyle to Robert Bradford, 5-26-1954. Governor's Papers, Box 82, folder 2, ASA, 30-0298.

[117]Bradford to Pyle, 5-26?-1954. Governor's Papers, Box 82, folder 2, ASA, 30-0298.

[118]S. C. Farrington to Gov. Pyle, 6-22-1954. Governor's Papers, Box 82, folder 2, ASA, 30-0297.

[119]S. C. Farrington to District Engineer, LAD, 7-22-1954. 601.1 Fort Huachuca, AZ. RE-D 6752, USAEPG Additional Lands, Box 21. Corps of Engineers, Arizona Real Estate Office,

15-0148

effective March 13, 1952, and gave to the US "all its rights, titles and interest, claim and demand" for described portion of fort.[120] The governor signed the deed on September 9th, but it was not submitted to the Secretary of State until the 14th.[121]

With the development of the USAEPG underway and the US again in possession of the fort, army requirements led to acquisition of additional land. In December 1955, S. C. Farrington of the Phoenix Corps office wrote Governor McFarland to advise that the army would need more of the old WWII artillery range for its operations. The army wanted the remaining portion of the range, only the western-most side of which was reacquired in 1954. Farrington was in the middle of preparing a planning report for acquisition of the additional lands, and asked Governor McFarland if he would commit to execution of a quitclaim deed for that portion of the artillery range in state hands and deeded to the state when the fort became surplus.[122] The negotiations regarding transfer of the

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[120]Quitclaim deed, Arizona to US, for a portion of Ft. Huachuca as set forward in EO of May 14, 1883, plus a portion of the East Range, 9-9-1954. USCoE Phoenix, Real Estate Office, ~~0011~~; see also 11-0019, from the DEH - Real Estate, Fort Huachuca. 15-0014

[121]S. C. Farrington to District Engineer, LAD, 9-14-1954. 601.1 Fort Huachuca, AZ. RE-D 6752, USAEPG Additional Lands, Box 21. Corps of Engineers, Arizona Real Estate Office, . 15-0150

[122]Lt. Col. William G. Skinner, Jr., Signal Corps, to Chief of Engineers, 10-19-1955. 601.1 Fort Huachuca, AZ. RE-D 6752, USAEPG Additional Lands, Box 21. Corps of Engineers, Arizona Real Estate Office, 15-0154; S. C. Farrington to Governor Ernest McFarland, through the Adj. Gen., State of Arizona Military Department, 12-23-1955. USCoE Phoenix, Real Estate Office, 0023. In March 1956 Wilber M. Brucker, Secretary of the Army, advised Gov. McFarland that the federal government had assumed jurisdiction over the 48,177 acres comprising Ft. Huachuca "acquired by the United States for military purposes." The declaration cleared up questions regarding police and other function at the post and in the surrounding area. Wilber M. Brucker, Secretary of the Army, to Gov. Ernest McFarland, 3-8-1956. USCoE Phoenix, Real Estate Office, materials sent to REO by Ft.H DEH, ~~0051~~ 11-0036 Attached is a "Perimeter Description for Federal Jurisdiction" that takes in both the entire old fort and "Parcel B," 3377.31 acres of the East Range adjoining the post.

11-0036, 15-0062

remainder of the artillery range continued into the summer of 1956, and in August the state and army met to work out details. Col. Frank Fraser of the National Guard reported on one meeting to Major General Walter J. Muller, Deputy Commander, Sixth Army. He noted that Governor McFarland would do what he could to expedite the transfer back to the army of the Artillery Range, but that the state wanted provisions in the transfer to allow for continued use of the fort's training facilities by the Guard and other reserve units. Headquarters at Fort Huachuca voiced no objection to such a clause.[123] In March 1957, the Phoenix Real Estate Field Office received a draft of a quitclaim deed for 10,200.4 acres, patterned after the deed dated September 9, 1954. Other than some additional required language for existing easements and roads, it was satisfactory.[124]

By mid-April, 1957, the transfer was ready. The state's major concern was that it be allowed to continue use of the artillery range and other areas for annual training exercises. Col. Fraser and the governor agreed that it should go forward, but wanted a provision allowing for continued training of Guard troops. Fraser asked if Hayden could help. He also sent a letter outlining this request to Secretary of the Army Wilber M. Brucker the same day, in which he noted favorable responses from the Sixth Army and Signal Corps. However, Fraser noted that the Corps of Engineers was reluctant to include language that would not allow successor officers to rescind permission for such use. "Apparently only you, Mr. Secretary," said Fraser, "can issue an order or directive that will establish a policy whereby the National Guard of Arizona (Army) will be assured of Fort Huachuca remaining as its permanent field training site."[125] By May

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[123]Col. Frank Fraser to MG Walter J. Muller, Deputy CO Sixth Army, 8-25-1956. Hayden Collection 563:10, Arizona Collection, ASU, 20-0033.

[124]William M. Curran, Jr., Chief, Acquisition Branch, Real Estate Division, LAD, to Area Engineer, Arizona Area Office, CofE, 3-6-1957. USCoE Phoenix, Real Estate Office, ~~0037~~. 15-0043

[125]Frank E. Fraser to Senator Hayden, 4-16-1957. Hayden Collection 563:10, Arizona Collection, ASU, 20-0031; Fraser to Secretary of the Army

2, 1957, a quitclaim deed from Arizona to the federal government was ready and signed, transferring to the US tracts 103, 104, 105, 106, and 107, which added to Fort Huachuca the majority of what is now called the East Range. Consolidation of federal public lands and state lands for which the federal government acquired title was made through Public Land Order 1471, August 22, 1957. Much of this land was previously in the WWII-era artillery range, and was withdrawn for use of the army in conjunction with the USAEPG.[126]. State National Guard units still use the fort for training and annual manuevers.

Conclusion

The state's issuance of the quitclaim for the remainder of the East Range and the withdrawal of federal public land for the use of the USAEPG in 1957 completed a long process of deactivation, disposal, reactivation and reacquisition begun in 1946. The fort, considered unnecessary in 1946, became established as a permanent and important installation of the Signal Corps after 1954. The needs of the military in 1951 during the Korean War were the reasons for its recapture under provisions of the deeds to the state in 1949. During the period of state control, January 1949 through January 1951, the cantonment (built-up) portion of the fort was under the control of the Arizona National Guard, as specified in the deed that it be used for "military purposes" for the first 20 years. While portions of the post were leased -- particularly residences or other buildings -- and other items were sold (buildings and equipment), all proceeds went into the National Guard fund for use at the fort. At least for the National Guard portion of the post, military use has been constant.

Wilber M. Brucker, 4-16-1957. Hayden Collection 563:10, Arizona Collection, ASU, 20-0032.

[126]Quitclaim deed from AZ to US, 5-2-1957. USCoE Phoenix, Real Estate Office, ~~0012.~~ The state acted under provision of Chapter 44, House Bill No. 170, of copy of which is attached to this deed. The purpose of the state statute was to clear title to lands that the US had repossessed under clauses in original transfers to state. Approved by Governor March 13, 1952, filed with Secretary of State of Arizona 3-13-1952; Public Land Order 1471, "Withdrawing Public Lands in Arizona for Use of Department of the Army, in Conjunction with Electronic Proving Ground, Fort Huachuca, Arizona," published in the *Federal Register*, 28 August 1957, Vol. 22, No. 167, pp. 6916-6917.

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CONSTRUCTION AND WATER DEVELOPMENT SINCE REACQUISITION, 1954.

Introduction.

Fort Huachuca's reactivation and eventual reacquisition by the Army between 1951 and 1954 has led to its permanent use. The long garrison period between WWI and WWII was replaced by training and other activities during WWII. Following the state's acquisition and dedication of the area as a game preserve and National Guard training area, its use during the Korean War revolved primarily around training aviation engineer units. However, location of the US Army Electronic Proving Ground (USAEPG) at Fort Huachuca in 1954 heralded a shift at the fort to an emphasis on development and testing of electronic devices to be used in the national defense; although training soldiers in their maintenance and use in a variety of conditions has continued to play an important role. The electronic warfare age replaced garrison life, mobilization and combat training troops experienced at the fort between 1919 and 1945. Further, with the arrival of the USAEPG came changes in the physical plant. Besides field testing requirements, the USAEPG also needed large barracks, offices, classrooms, and laboratory complexes. As other new tenant units arrived, post planners built the additional structures needed; Greely Hall is one obvious example. Further, longer-term assignments during peacetime resulted in the need for housing for both military and civilian personnel and their families. Sierra Vista grew with the influx of civilian workers; so too grew the number of housing units on post. These changes were among those that led to recurring concern over the adequacy of the post's water supply.

This chapter will discuss three major topics: the growth and evolution of important tenant units; the mission of important tenant units; and its response, both in buildings and resulting requirements for an increased water supply. It will not provide a building-by-building or unit-by-unit discussion, focusing instead on a more broad evaluation of development and construction, and key events during the post-1954 period.

The USAEPG Period, 1954-1967.

The US Army Electronic Proving Ground (USAEPG) was the first unit to occupy the post upon its permanent reactivation in February 1954. The USAEPG was an arm of the Signal Corps, which up to that time operated primarily from Fort Monmouth, New Jersey. As noted earlier Fort Huachuca's remote location made it a better area than New Jersey for testing military electronic devices, as is was free from other signal interference and was far enough away from major cities not to disrupt civilian radio and television signals. By July two units, the 1st and 505th Signal Groups arrived. The Army assigned the USAEPG to Fort Huachuca for the purpose of testing and evaluating military electronic equipment developed for the Army, and to assess the performance and dependability of electronic devices relied on and utilized in combat. These include a wide array of items used by soldiers for surveillance, communications, avionics, automatic data processing, meteorology, and electronic warfare. The USAEPG concentrated on testing communication equipment, such as radios, digital data transmission systems, aircraft surveillance systems, among others, as part of the Army's Test and Evaluation Command, a branch of the U.S. Army Material Command. The USAEPG was the main headquarters at the post until the arrival of STRATCOM in July 1967.[1]

The arrival of the USAEPG resulted in a building boom both on and off the post. There was an immediate need for all types of buildings on the post -- technical facilities, barracks, messes, warehouses, shops, and family housing for both military and civilian personnel. The USAEPG used existing structures, particularly WWII era mobilization buildings, to fill immediate needs upon arrival. Folsom Moore, Senator Carl Hayden's long-time friend and political ally from Bisbee, advised him that during a visit to the fort post commander General Emil Lenzner had described needed additional buildings, including recreational facilities, industrial and testing centers, and "Wherry housing." The general saw housing as particularly important. Moore noted, "he says that he simply must have

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[1]Headquarters, US Army Garrison, Fort Huachuca, Arizona, "Fact Sheet," October 1968. Arizona Collection, HM-60 Fact Sheet, ASU, 20-0136.

housing to obtain the civilian assistance absolutely necessary for the full activation of the Fort." General Lenzner requested $11 million to cover the necessary construction.[2] Hayden learned from the Secretary of Defense that until Fort Huachuca became a Class II installation (permanent and under the Chief Signal Officer rather than Sixth Army) it would not be eligible for Wherry housing; the other items were in the budget process and would depend on congressional action.[3]

Once Fort Huachuca was declared a Class II installation (by General Order No. 2, 14 January 1954) the Secretary of Defense approved a 500 unit project at the fort on October 8, 1954. The army began processing the project soon therafter. News that it would get Wherry units caused some cheer at the post, although the houses might address only a quarter of the overall need. General Lenzner advised the *Phoenix Star* that he was concerned that he would be unable to get the civilian staff he needed without adequate housing. Fort authorities estimated that 2,000 families, both military and civilian, lived off post, some commuting from Tucson and Benson on army-supplied buses. Many of the officers whose families were unable to join them were living in bachelors quarters. Planned growth was rapid: from a skeleton staff of less than 100 in January, by September 1954 there were 945 civilian employees, along with 3,600 enlisted men and 407 officers. The army planned to have 7,200 enlisted men and 800 officers stationed by January 1955; 9,500 military and civilian personnel would be at the post by mid-1955, with an unknown number of dependents.[4]

The housing boom also spilled outside the fort's boundaries. On October 15, 1954, the *Tucson Citizen* announced that Busby & Carroll Construction Company, local builders, had plans to build 100 houses at

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[2]Folsom Moore to Carl Hayden, 3-22-1954. Hayden Collection, 176/30, Arizona Collection, ASU, 20-0054.

[3]BG T. A. Carter, GS, Chief, Service Division, to BG R. S. Moore, Special Assistant to Secretary of Defense, 4-26-1954. Hayden Collection, 176/30, Arizona Collection, ASU, 20-0057.

[4]Office of the Chief of Legislative Liason, Department of the Army, "Wherry Housing -- Fort Huachuca, Arizona," 10-11-1954. Hayden Collection 176/30, Arizona Collection, ASU, 20-0060; *Phoenix Star*, 10-15-1954.

Fry, just outside the fort's main gate. General Lenzner estimated that the town would need 1,000 housing units as the post grew over the next few years; the civilian housing director put the figure at 1,500. Busby wanted to establish a community, donating land for a school and money to start a volunteer fire department. The company also got the franchise for water service in the town, and began drilling a well as a part of a $50,000 water system. They also had plans for another 450 houses, with room for 1,500 in all. Other developers had two other projects underway, one near Bisbee and the other about 4.5 miles from the post's main gate.[5]

The army tried to address housing needs in its annual requests for military construction funds. In February 1955 the District Engineer, San Francisco District, Corps of Engineers, announced that the 500 family units of Wherry Housing slated for the post were to be ready for bid in May or June. For Fort Huachuca the army planned 100 three bedroom, 300 two bedroom, and 100 duplex one bedroom quarters. By March 21, 1955, the fort planners presented construction project justification data to the Department of the Army for a variety of additional structures and facilities on the post. Among these were the 450 additional family units, a large warehouse, airfield facilities (e.g., control tower, hangar, additional apron area, fuel tanks), a field house with swimming pool, bachelor officer quarters, and other buildings. The airfield was without permanent utilities; water was piped in through an above-ground "invasion type casing" line. This would be remedied by extension of utilities to the airfield.[6]

Senator Hayden asked the Secretary of the Army about rehabilitation of family housing at Fort Huachuca in March, 1955. The secretary's legislative liason, Major Guy McConnell, advised Hayden that 74 units of permanent quarters were to be rehabilitated, along with 379 units of temporary

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[5]*Tucson Citizen*, 10-15-1954.

[6]District Engineer, San Francisco District, USCOE, Press Release, 2-24-1955. Hayden Collection, 176-30, Arizona Collection, ASU, 20-0062; Department of the Army Construction Project Justification Data FY 1956, 3-21-55. Hayden Collection, 176-30, Arizona Collection, ASU, 20-0063.

quarters, besides the 450 new units planned by the fort.[7]

Development on the post continued into the next year, and Congress and the army responded by approving another 575 units of Capehart housing.[8] In November, General Lenzner described the building program and housing situation for Hayden. For officers there were 571 family units either existing, being built or programmed; for NCOs, 802 units existing, being built or planned. The new housing was a mixture of Wherry and Capehart program funds. "It should be noted that these figures do not include any quarters which now exist and are of a temporary nature," added Lenzner. "I am vacating as promptly as possible undesirable family quarters in East Apache now occupied by NCO's and will, as promptly as possible, convert those into efficiency apartments for single civilians, particularly women." Another 75 temporary units in the area known as Bonnie Blink were to be sold to make room for the Capeharts.[9]

At the end of the year Moore visited General Lenzner and asked that he send a prioritized list of desired construction to Hayden. General Lenzner sent his list on December 28, 1956. It contained 16 items, the first being a battalion headquarters building, followed by recreational facilities for the barracks area, motor park and shops, two classroom buildings, roads and utilities, two enlisted barracks without mess, a four-company mess hall, 60 man BOQ, two civilian dormatories, and a variety of other buildings. Also underway was planning for a large "Technical Building" which

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[7]Major Guy McConnell to Senator Carl Hayden, 4-5-1955. Hayden Collection, 564:3, Arizona Collection, ASU, 20-0026.

[8]"Units of Capehart Housing Approved by Department of Defense for Installations Being Served by Existing Wherry Housing, as of February 13, 1956." Hayden Collection, 564:3, Arizona Collection, ASU, 20-0027. "Wherry" and "Capehart" refer to housing produced under different acts authored by Representatives Wherry and Capehart, and are different styles of housing on the post. Wherry units are the older of the two; Capeharts are the flat roofed units seen west of Myers School.

[9]General Lenzner to Carl Hayden, 11-5-1956. Hayden Collection, 563:10, Arizona Collection, ASU, 20-0029.

has since become known as Greely Hall.[10]

General Lenzner described the post's growth in a presentation before the Third Arizona Industrial Development Conference in March, 1957. He sent Hayden an advance copy of his speech, in which he outlined construction to date and plans for the next years. "Of the hundreds of military establishments operated by our national defense less than twenty-five fall into the pattern of Fort Huachuca," wrote Lenzner. "Certainly, the direction, control and operation is exercised by personnel in army uniform but in every other respect Fort Huachuca is not unlike a multi-million dollar industrial organization." Limited construction in FY 1955 gave way to $12 million in FY 1956; for FY 1957 expenditures would range near $16 million. He hoped that over the five year period starting with FY 1956 to invest $50 million in the fort, in particular for "1600 family homes, troop barracks and a technical engineering building." Rehabilitation of existing facilities, including buildings and utilities, had run to as much as $6 million; "we feel that this activity will be stabilized at an amount of six to seven million dollars annually." The post was staffed to capacity by nearly 7,000 troops (90% enlisted, 10% officers) but was at less than full strength given that additional barracks would not be available for several years; 1800 civilians were also on staff.[11] Moore visited the post in May and reported to Hayden that "progress in the building program is astounding." Within the year the post should be completely staffed and planning for the "Technical Building" was well underway. Additional barracks were still needed, however. The Field House (recreational facility) was under construction, as was the BOQ building. Post planners also had negotiations underway for "the final increment of Capehart housing -- the 297 houses for civilian employes."[12]

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[10]General Emil Lenzner to Carl Hayden, 12-28-1956. Hayden Collection, 563/8 #3, Arizona Collection, ASU, 20-0117.

[11]General Emil Lenzner to Carl Hayden, 3-8-1957, enclosing "Looking Forward with Fort Huachuca." Hayden Collection, 563/8 #3, Arizona Collection, ASU, 20-0018.

[12]Folsom Moore to Carly Hayden, May 8, 1957. Hayden Collection, 563/8

The new family housing caused a need to adjust and augment the water system. In 1956 the post installed a 1,500 gpm booster station to support the needs of the 500 Wherry units. Three 500 gpm pumps drew on the 3 million gallon tank (installed in 1942), feeding a 10,000 gallon pressure tank that supplied the Wherry distribution system.[13]

Overall, for FYs 1956 and 1957 the Army planned 1,275 units of family housing. In August, 1957, Frank Dryden of the Senate Committee on Appropriations, informed Hayden (the committee chairman) that some $2.703 million in supplemental appropriations for Fort Huachuca were before President Eisenhower for his signature. The projects included two 326-man barracks, a battalion mess and administration and supply building, plus a hangar and shops. "Indications from the Army are that these items will be placed under contract during the year." Dryden said that the Army was uncertain about "future plans," but noted that "long-range plans for Fort Huachuca are such as to safely anticipate that construction will continue for several years, current world situations remaining unchanged."[14] The post continued to develop. On December 1, 1957, the US Army Combat Surveillance and Target Acquisition Training Command was activated at the fort. Its mission was "to train selected individuals in the utilization, operation, amintenance and repair of ground or airborne combat surveillance, and target acquisition equipment."[15]

#3, Arizona Collection, ASU, 20-0119.

[13]"Military Construction Line Item Data," January 1963, prepared by Col. T. J. Seigler, "Supplemental Data, History of Development of Post Water Supply." Hayden Collection, 275/118 #4, Arizona Collection, ASU, 20-0130.

[14]"Fort Huachuca, Arizona," (general fact sheet, ca. 1957). Hayden Collection, 563:10, Arizona Collection, ASU, 20-0030; Franklin B. Dryden to Carl Hayden, 8-27-1957. Hayden Collection, 563:10, Arizona Collection, ASU, 20-0035.

[15]"Fact Sheet," Department of the Army, US Army Combat Surveillance School, Fort Huachuca, Arizona, 7-12-1965. Hayden Collection, 275:119, Arizona Collection, ASU, 20-0023. By 1965 this command had 357 officers,

In fact, the building program at Fort Huachuca was extensive. MCA Construction summaries presented to Senator Hayden in January 1958 showed plans for FY 1956 through 1964:

FY	Amount	Comments
1956	$6,488,200	11 projects including 200 housing units and extension of utilities; all completed or under construction.
1957	$17,575,100	11 projects including 615 housing units and work on roads and utilities, and $3.932 million for the first increment of the USAEPG Technical Building.
1958	$2,249,965	Proposed program for 8 projects, among which were barracks, mess, testing and laboratory buildings.
1959	$3,738,000	Proposed program for 8 projects, including battalion Hq building, 3 barracks, technical facilities, shops.
1960-64	$36,079,000	Proposed program for 89 projects, including final increments of the Technical Building, 200 family housing units, a 72 unit trailer court, 6 barracks (of which four were 326 man), 2 civilian dormatories, a 250-bed hospital, BOQs, and a variety of technical, maintenance, and testing facilities. (Averaged $7.2 million per year.)

The *Tucson Daily Citizen* announced in May that there were about 11,000 adults and children on the post, and that the "building boom expected to last for years."[16]

The continuing expansion of the fort family housing supply led to increased pressure on the water system. The post took two actions to ameliorate the situation. One was construction of a 1.5 million gallon concrete tank/reservoir at the base of Reservoir Hill west of the

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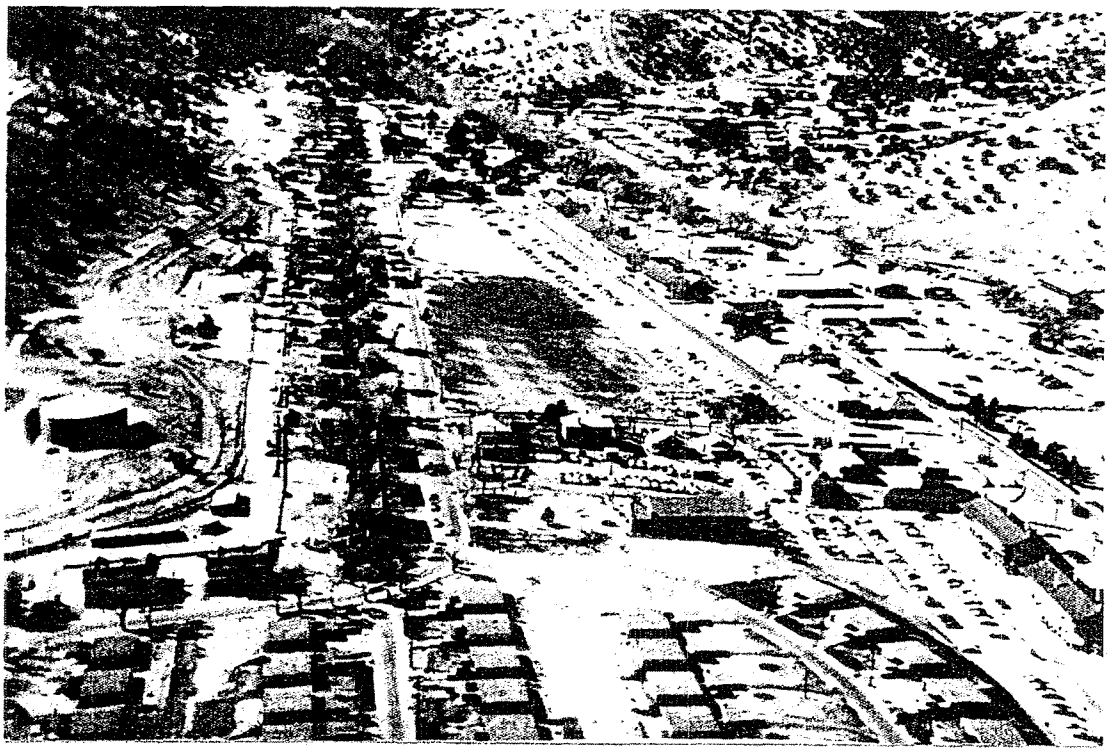
enlisted personnel, and civilian staff. The command noted that its strength had increased 37% over the last two years.

[16]"MCA Construction." Hand dated 1-6-1958. Hayden Collection, 563:10, Arizona Collection, ASU, 20-0036; *Tucson Daily Citizen*, 5-22-58.



Aerial view of Old Post area ca. 1958. Wherry housing units have filled the lower parade ground. The 1.5 million gallon reservoir is visible on left.

Fort Huachuca Capehart housing, 1958.

Officers' Club. It was "at an intermediate elevation between the 3 million gallon reservoir and the 450,000 gallon reservoirs" located at the top of the hill. "This reservoir was constructed to provide additional storage in support of 575 units of Capehart Housing as well as MCA construction projects." The 10,000 gallon pressure tank was taken off line and the three booster pumps both used to feed the new reservoir and pump directly into the system. The second action was installation of Well No. 6, located west of and between wells 3 and 4. The well was drilled under the direction of the USGS, and could produce 750 gpm. (It was not connected to the system until 1960, when a pump and surge tank were added. It fed into the 3 million gallon reservoir.)[17]

At the end of 1959 the water distribution system still had problems. Major General R. T. Nelson, the Chief Signal Officer, advised Senator Hayden that the Secretary of the Army had "concurred in the improvement of the Water Distribution System at Fort Huachuca as an urgent-type project which qualified for inclusion in the FY 60 Military Construction, Army program in the amount of $165,000." Fort Huachuca's commanding officer was to provide detailed design and justifications, and Moore anticipated that funds would be available within six months. At the same time, Nelson noted that additional housing was also planned, including 200 units of Capeharts for FY 60 (project to be under contract within six months); another 344 units of Capeharts were requested for FY 61, but only 100 were included in the Department of Defense's requirement in that year's construction budget.[18]

The fort provided a summary of "Water Problems at Fort Huachuca" to Senator Hayden in 1959. The post got by using groundwater, pumped from the five wells previously mentioned, providing 3,350 gpm or 4.82 mgd when pumped around the clock. Well No. 6 had been drilled and cased, but had no

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[17]"Military Construction Line Item Data," January 1963, prepared by Col. T. J. Seigler, "Supplemental Data, History of Development of Post Water Supply." Hayden Collection, 275/118 #4, Arizona Collection, ASU, 20-0130.

[18]Maj. Gen. R. T. Nelson to Carl Hayden, 12-3-1959. Hayden Collection, 403:9, Arizona Collection, ASU, 20-0003.

pumps or related equipment. Post planners optimistically believed that if it were added they would have available 5.9 mgd on a 24 hour pumping schedule, "which will suffice for all forseeable future needs." Storage in post reservoirs supplied various zones on the post. The upper reservoirs (450,000 gallons) supplied the old post area; the 1.5 million gallon reservoir supplied the Wherry Housing, all MCA areas, and a portion of the Capehart Housing area. The 3 million gallon concrete reservoir, and a 500,000 gallon tower tank supplied the "old mobilization areas" (i.e., the WWII construction). Another 500,000 gallon tank had been disconnected by the WAA; the post proposed that it used be for fire fighting in the hospital area.[19]

Even with the addition of Well No. 6, the water supply system needed improvement. The post's FY 60 MCA minor new construction program included items to accomplish this need. Wells No. 1 and 2 supplied the old post reservoirs through a 10 inch main, so supply was cut off if a pump broke down or the main broke. Further, one half of the Old Post's reservoir storage was held for fire reserve. Planners suggested changes in the supply system to allow better shifting of water among the reservoirs so that all wells could provide water to all storage, and requested funds to connect the 10 inch line to the old post reservoirs to a line to the 3 million gallon reservoir; installation of a 750 gpm booster pump to help feed the 1.5 million gallon reservoir, and another 1500 gpm booster station to feed the old post reservoirs ($47,500); reconnect the old 500,000 gallon tower tank (as mentioned above); and connect Well No. 6 into the system ($89,000). This work would total $172,900. The need for these improvements was made clear by the fact that on May 13, 1959 water consumption reached 3.54 million gallons; the post command ordered a "more stringent watering schedule" for fire protection. "If this had not been done, water consumption would have reached approximately 4,000,000 gallons per day which is beyond the capability of the post supply system."[20]

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[19]Fort Huachuca [?], "Water Problems at Fort Huachuca," ca. 1959-60. Hayden Collection, 563:9, Arizona Collection, ASU, 20-0041.

[20]Fort Huachuca [?], "Water Problems at Fort Huachuca," ca. 1959-60.

By March of 1960, the USAEPG Technical Building's first increment was completed and the second increment had construction underway. Other projects completed included three additional barracks, extension of utilities, and a variety shops and technical buildings; those underway included another barracks, shop facilities, and test units. The House authorized funds for another 100 units of Capehart family housing on March 6, but had not yet been enacted by the Senate nor signed into law.[21]

Growth forced the fort, as noted above, to continue development of its water system, and in June 1960 the House passed $84,000 for expansion of the water distribution system. Congress had earlier allotted $165,000 under "Urgent Minor New Construction -- FY 60" and the fort had the project advertised. At the same time the post had received a bid (considered unresponsive and readvertised) for 200 Capehart family housing units. Another 100 units were under FY 61 funding. At the end of the year the Capehart Program on the post featured 575 units completed, another 60 under construction, with 300 "in process. In May, 1961, the USAEPG estimated that, once construction on the additional Capehart units was finished, the post would have 1,968 sets of family quarters.[22] In 1961 a booster pumping station with three 500 gpm pumps was installed at the base of the 1.5 million gallon reservoir to feed the small "Old Post" reservoirs at the top of the hill. An additional 500 gpm pump was also added to the Wherry booster pumping station, so that it could handle 2000

Hayden Collection, 563:9, Arizona Collection, ASU, 20-0041.

[21]Lt. Col. M. C. Harrison to Leonard Edwards, Military Construction Subcommittee, Senate Appropriations Committee, 3-18-1960. Hayden Collection, 403:9, Arizona Collection, ASU, 20-0006.

[22]Paul R. Eaton to Carl Hayden, memorandum, 6-13-1960. Hayden Collection, 403:9, Arizona Collection, ASU, 20-0007; "MCA Construction Program - FY 60 (and prior) [date?]. Hayden Collection, 403:9, Arizona Collection, ASU, 20-0008; Office of the Assistant Secretary of Defense (Properties and Installations), "Status of Title VIII (Capehart) Housing Program as of December 31, 1960." Hayden Collection, 403:9, Arizona Collection, ASU, 20-0009; USAEPG, "Status of Construction (MCA and Capehart) as of May 1st, 1961, Ft. Huachuca, Arizona." Hayden Collection,

gpm.[23]

Part of the pressure for growth probably came from the arrival in 1960 of an additional unit to Fort Huachuca, the US Army Security Agency Test and Evaluation Center (USASATEC). USASATEC was responsible for testing the effectiveness and dependability of equipment produced by research and development of the U.S. Army Security Agency. USASATEC used Fort Huachuca's varied terrain as a test environment to evaluate newly developed systems and equipment, both offensive to defensive systems.[24]

As mentioned above, in 1958 the post installed Well No. 6. It was drilled to a depth of 1,230 feet and given a 16 inch in diameter casing to 803 feet, which then descended open another 12 feet, followed by an 8 inch uncased shaft to 1,230.[25] Well No. 6 was fitted with pumps and other equipment in 1960 and attached to the system. Post planners believed before it was connected that it would provide an answer to the installation's water problems; however, they also were aware that the aquifer was a finite resource. Beginning in the fall of 1959 the USGS Ground Water Branch, at the request of Fort Huachuca and at Department of the Army expense, studied water resources available to the post. General Urhrane advised Senator Hayden that the USGS recommended "maximum utilization of the spring water [in Huachuca and Garden Canyons] for recharging the underground water supply which is being depleted at an ever-increasing rate due to heavy pumping both on the installation and in surrounding

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403:9, Arizona Collection, ASU, 20-0010.

[23]"Military Construction Line Item Data," January 1963, prepared by Col. T. J. Seigler, "Supplemental Data, History of Development of Post Water Supply." Hayden Collection, 275/118 #4, Arizona Collection, ASU, 20-0130.

[24]Fort Huachuca, Arizona: History 1974, p. 13. 10-0153

[25]S. G. Brown, E. S. Davidson, L. R. Kister, and B. W. Thomsen, *Water Resources of Fort Huachuca Military Reservation, Southeastern Arizona.* Water Supply Paper 1819-D. Prepared in cooperation with the U.S. Army Electronic Proving Ground Fort Huachuca, Arizona. (Washington: GPO, 1966), p. D-26. Hereafter cited *Water Resources of Fort Huachuca,*

Brown et al 1966

communities."[26]

The USGS Study, 1959-1964

General Urhrane based this comment on the USGS study, which ran from 1959 to June 1963 and examined wells, aquifers, surface flows and spring flows in and around Fort Huachuca. Its aim was to "locate additional water supplies and evaluate existing sources." The scientists inventoried wells in the study area and fitted three with recording gages, examined all springs and gaged those with substantial flows, and gaged surface flows in Garden and Huachuca canyons. The authors noted that "the flow from springs generally is not used by the fort, but it is sufficient to supply the entire water demand during some periods." In addition, "spring flow, if used to supplement the ground-water supply, will decrease the draft on the ground-water reservoir in the two basin-fill units; or it could be used for artificial recharge to these aquifers." Finally, the authors noted that if a second well field were developed near North Gate-Libby Field, it "would partly accomplish the same result by decreasing the heavily concentrated draft on the ground water reservoir of the Fort Huachuca well field, and by utilizing ground water that now moves unused northeastward to the San Pedro River."[27]

The post's only supply was from wells and springs, surface water flowed to the San Pedro and Babocomari rivers only at times of prolonged precipitation or torrential downpour. Only a small portion of water precipitated ever reached the aquifer, the great bulk of it lost to evapotranspiration. Of the springs, only those in Garden and Huachuca canyons were sufficiently large to be useful to the fort. As to the aquifer, the researchers noted that not all of the decline in the aquifer around the fort and Sierra Vista was caused by their well fields, but the fact that

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1966.

[26]Major General F. F. Uhrhane to Carl Hayden, 2-28-1963. Hayden Collection, 275/118 #4, Arizona Collection, ASU, 20-0128.

[27]*Water Resources of Fort Huachuca*, 1966. pp. D-1 - D-3.

the wells in Fort Huachuca and Sierra Vista experienced a greater rate of decline than other wells scattered in the region indicated that the difference was caused by the influence of heavy pumping.[28]

Garden Canyon's recharge under natural conditions could be as high as 1 mgd, but only when flows were high and evapotranspiration was negligible. Heavy summer rains, they noted, evaporated almost immediately. Further, an underlying (below ground surface) ridge separated the aquifer feeding the fort wells from that fed by Garden Canyon. Fort Huachuca's main wells produced a total of 1,514.65 million gallons between October 1959 and June 1961; the maximum month was May 1960, when 104.2 million gallons was pumped, for an average of 3.36 mgd; the minimum month was November 1959, when 43.69 million gallons was pumped, averaging only 1.45 mgd.[29] Pumping had a substantial effect on aquifer draw down, the authors noting that if wells No. 1 through 5 were pumped at 600, 600, 500, 600, and 500 gpm respectively for a year, water levels in Well No. 6 would be drawn down 15.8 feet. If operated at this level 18 hours a day, however, the drawdown was three feet.[30]

Springs in Garden and Huachuca canyon might provide substantial flows if collected. The average spring flow in Garden Canyon between October 1959 and June 1963 was 413 gpm, or .059 mgd. Total surface flows in Garden Canyon during this period was 3,040 acre-feet, or 994 mg, and averaged about 503 gpm. Huachuca Canyon's geological structure was less conducive to springs, so runoff tended to be higher and spring flows lower. However, Huachuca Canyon had an "underflow" between October and November 1959 of 200 to 300 gpm.[31]

The USGS wanted to judge how runoff in Garden Canyon compared to the fort's well field production. They noted that there were only two instances during their study where runoff exceeded pumping: January to

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[28] *Water Resources of Fort Huachuca*, 1966, pp. D-20 - 21.

[29] *Water Resources of Fort Huachuca*, 1966, pp. D-24-26.

[30] *Water Resources of Fort Huachuca*, 1966, pp. D-31-32.

[31] *Water Resources of Fort Huachuca*, 1966, pp. D-37, D-42.

June 1960, and December 1961 through May 1962. However, runoff would supply a substantial percentage of the fort's needs -- approximately 30% during the period of the study. "For protracted periods, however, the flow of Garden Canyon Creek was less than 10 million gallons per month," and during the period of study Huachuca Canyon's runoff was one tenth that of Garden Canyon.[32]

The point of the USGS study was to evaluate additional sources of supply. They suggested 1) collecting and diverting to the fort spring flows in Garden Canyon, and 2) using any "excess water" for recharge in the well field aquifer. In summary, "from October 1959 to June 1963, more than 1 billion gallons of spring flow and runoff was measured at the gaging stations in Garden Canyon, and more than 3.2 billion gallons was pumped from the Fort Huachuca well field. Therefore, the spring flow can significantly add to the fort's water supply." Because these flows came at times when pumping needs were low, storage in a surface reservoir or by recharge would be necessary. This would relieve to a degree the "cone of depression" caused by Fort Huachuca and Sierra Vista well fields. Water level in Well No. 6 dropped an average of three feet per year from November 1959 through May 1961, "caused by pumping of the fort well field and interference from the Sierra Vista well field."[33]

The USGS report formed the basis for suggested improvements to the water supply system at the fort in the years that followed. Post engineers designed plans to implement the spring collection and recharge system; and later plans added the use of reclaimed waste water for irrigation. As noted above, the post began examining use of the springs even during the USGS field work. Post planners estimated that if troops performed rehabilitation and construction on the Huachuca Canyon and Garden Canyon pipelines the project the total cost would be $387,700; if done by outside contractor it might reach $858,935. In both instances rehabilitation entailed replacement of water lines; work in Huachuca Canyon included construction

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[32] *Water Resources of Fort Huachuca*, 1966, pp. D-43.

[33] *Water Resources of Fort Huachuca*, 1966, pp. D-53-56.

of dikes, while in Garden Canyon the requirement was for dams to collect spring water.[34]

In January 1963 Fort Huachuca requested $1.197 million to develop the spring water supply in Huachuca and Garden canyons. The post made the application before the USGS report was published. Deputy Post Commander Col. T. J. Seigler prepared an application for a project that would implement most of the recommendations made by the USGS. The project entailed salvage of existing pipelines, excavation and construction of dikes and infiltration galleries to collect spring water, lay pipes, install chlorination equipment, and drill required wells for testing and recharging the aquifer. The USGS would supervise construction of recharging wells and collection works.[35]

Col. Seigler explained that pumping had, between 1954 and 1963, lowered the groundwater level 18 feet. "The demand for water on the Installation as well as surrounding communities," he advised, "has increased over the past 8 years from approximately 1,140,000 gallons per day to 6,600,000 gallons per day." The post hoped to supplement that supply -- a draw of 4 million gallons per day during the peak months of March-June -- by fully using water available in the canyons. According to Seigler, the USGS estimated an average monthly flow of 30.25 million gallons, the bulk of which was lost to evaporation and transpiration. During the wet winter months (December - March), water collected in the canyon system would replace groundwater and any surpluses would be pumped into the aquifer; in the summer it would augment supplies pumped from the wells. They estimated that the spring system would produce 350 million gallons per year (average flow), "of which it is estimated that 250,000,000 gallons can be utilized directly to provide a portion of the Post domestic water supply." Besides saving $35,000 annually it would also conserve a "critical natural

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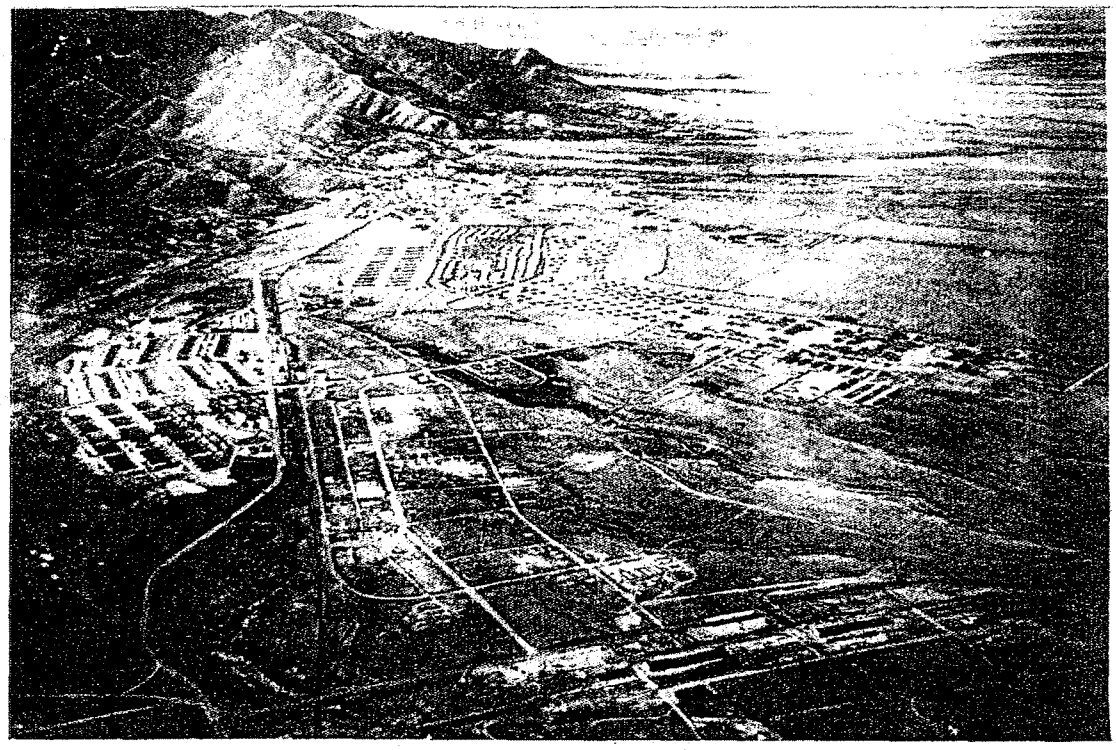
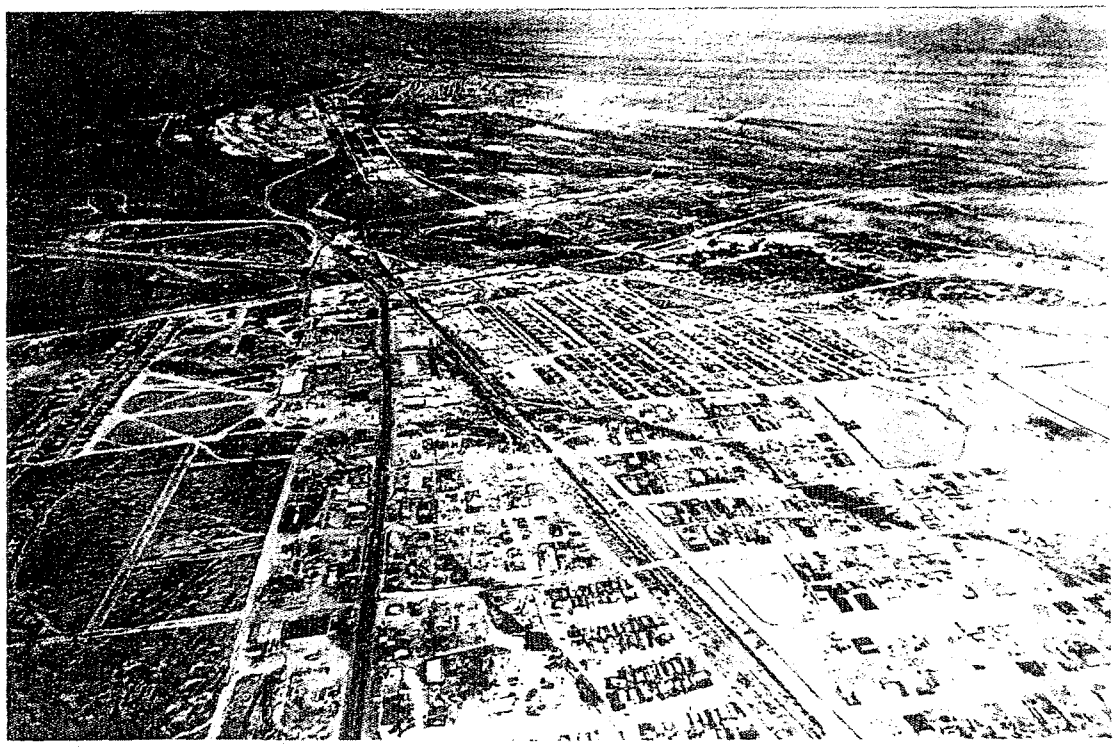
[34]"Engineer Troop Construction and Maintenance Projects, EETF Facility Requirements -- FY 62 and Development of Fort Huachuca Water Resources." [1961?]. Hayden Collection, 403:9, Arizona Collection, ASU, 20-0012.

[35]"Military Construction Line Item Data," January 1963, "Supplemental Data, History of Development of Post Water Supply," prepared by Col. T. J. Seigler. Hayden Collection, 275/118 #4, Arizona Collection, ASU, 20-0130.



Aerial view of WW II cantonment area, 1959. The WAA and State of Arizona sold a large number of buildings, the streets surrounding which are visible in the center.



Aerial view of Sierra Vista and Fort Huachuca, 1960. Sierra Vista is in the foreground.

resource which is being depleted," the USGS showing an annual decline in the water table of 2.4 feet. "Furthermore, the rate of this depletion is continually increasing as more and more new wells are drilled adjacent to this Installation by the City of Sierra Vista and Fry." Sierra Vista pumped 1.4 million gallons per day.[36]

The existing system of wells, booster pumps and reservoirs produced a maximum output of 4.2 million gallons per day with all wells and pumps working around the clock, "as compared to a peak consumption of 4,461,000 gallons per day." The excess consumption of 300,000 gallons was handled by post storage facilities. Col. Seigler feared that an extended period of over-draft on storage would jeopardize the post's ability to fight fire.[37]

Col. Seigler also evaluated alternatives. The post's wells were already as deep as the entire existing aquifer, so making them deeper would not likely produce additional supply; plus, water pumped from such deep wells would be expensive. Drilling additional wells would produce immediate relief but would also increase over-all depletion of the aquifer.[38] Despite the application and the sense of impending shortages it imparted, the project was not immediately approved. It appeared in later requests, along with requests for additional barracks, BOQs, and office and administrative buildings.[39]

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[36]"Military Construction Line Item Data," January 1963, "Supplemental Data, History of Development of Post Water Supply," p. 5. Hayden Collection, 275/118 #4, Arizona Collection, ASU, 20-0130.

[37]"Military Construction Line Item Data," January 1963, prepared by Col. T. J. Seigler. Hayden Collection, 275/118 #4, Arizona Collection, ASU, 20-0130.

[38]"Military Construction Line Item Data," January 1963, "Supplemental Data, History of Development of Post Water Supply," p. 5. Hayden Collection, 275/118 #4, Arizona Collection, ASU, 20-0130.

[39]Mike Rexroad to Carl Hayden, Memorandum, "Ft. Huachuca Arizona fiscal year 1966 military construction program," 4-30-1965. Hayden Collection, 275-119, Arizona Collection, ASU, 20-0021.

Rodney Roeske of the USGS prepared an internal, administrative report on streamflow and spring discharge in August, 1964, that covered October 1959 through April 1964. Roeske's summary of flows from the mountain springs and streams supported the concept delineated earlier by the USGS and Col. Seigler. He reported that during the period studied some 4,900 acre-feet (or 1.6 billion gallons) came from Garden Canyon; Huachuca Canyon contributed about 490 acre-feet. Roeske noted that the "major springs in Garden Canyon are Spring 2, Spring 1, and Picnic Spring." Spring 2 had a continuous flow averaging 237 gpm; Spring 1 had a continuous flow averaging 208 gpm. Maximum streamflows occured near the gaging station in Garden Canyon, past which during the four years between October 1959 through September 1963 flowed the equivalent of 44% of the fort's needs during that period.[40]

Continuing Growth, 1964-67

The post continued to grow in the 1960s, though not perhaps at the hectic pace of the period between 1954 and 1960. The fort's commander, Maj. Gen. B. H. Pochyla, described the post population to Congressman Morris Udall in May 1965. The total daytime population was about 13,100, while at night this dropped to 10,400. He noted that since July 1960, 3000 military personnel had been withdrawn from the post for other duties around the world, only partially balanced by the arrival of 1000 troops from other forts. Maj. Gen. Pochyla also listed the major units on the post and their "working strength" (see table following). The USAEPG and 160th Signal Group were the largest two commands, accounting for more than three-quarters of the total working strength at the post.[41]

In May 1965 the Army proposed shifting some personnel from Fort Huachuca to Fort Monmouth. This led Senator Hayden to express concern over decreasing use of the fort to Secretary of the Army Stephen Ailes. Ailes

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[40]Rodney H. Roeske, USGS, "Streamflow and spring discharge in Garden and Huachuca Canyons, Fort Huachuca Military Reservation, Arizona." Prepared in cooperation with the US Army Electronic Proving Ground. Labeled: "Administrative report for U.S. Government Use Only." Tucson, Arizona, August 1964, p. 26. Hayden Collection, 275:121, Arizona Collection, ASU, 20-0002.

[41]Maj. Gen. B. H. Pochyla to Morris K. Udall, 5-6-1965. Hayden Collection, 275:119, Arizona Collection, ASU, 20-0022.

UNIT WORKING STRENGTHS

Unit	Total (mil. and civ.)
USAEPG	4474
Sixth US Army Support Element	43
US Army Hospital	246
160th Signal Group	1987
US Army Electronic Research and Development Activity, Arizona	263
US Army Combat Development Command Communications-Electronic Agency	94
Command Control Information System, Systems Design and Engineering Division	378
US Army Combat Development Command, Command Control Information System Group	48
52nd US Army Security Agency Special Operations Command	499
US Army Combat Surveillance School	340
Total	8372

soothed Hayden's concerns by pointing out the relatively small numbers in the proposed transfer, and by sending Hayden a confidential extract from the army's five year construction plan that showed proposed development at the fort. A $4.6 million army hospital was planned for FY65, BOQs for FY66 and 67, a telephone exchange for FY68, and medical barracks, water supply development ($1.197 million, the same figure proposed by Col. Seigler), commissary and street extension in FY 1969, and two barracks complexes ($3 and $6.5 million respectively) and another street extension for FY69 and 70.[42]

Hayden's worries must have been further assuaged by the army's decision to send the 11th Signal Group to Fort Huachuca in 1966, from Fort Lewis, Washington. The 11th formed an integral part of Fort Huachuca's communications network. It is responsible for initiating and operating emergency communications systems and has provided rapid mobile communi-

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[42]Secretary of the Army Stephen Ailes to Carl Hayden, 5-28-1965. Hayden Collection, 275:119, Arizona Collection, ASU, 20-0024.

cation networks in emergency situations.[43] The group was instrumental in installing and maintaining disaster relief area communications networks. Senator Hayden announced in April that the 3,500 man combat training brigade would begin arriving in September, "at the rate of 450 per week and continue up to the 3,500 capacity. Along with the troops some 1400 administrative and training personnel will also arrive." The brigade was to train in combat support services, "such as the clerical, mechanical, and vehicular operation fields."[44] Also in that year the Army established its Electronic Warfare School at the fort as a part of the Combat Surveillance School. This school presents courses in operation and maintenance of "electronic warfare equipment." It, like the Combat Surveillance School and other smaller units on the post, was a unit of the Sixth Army. Other Sixth Army units included the Raymond Bliss Army Hospital. In addition, the army assigned units such as Meteorological Support Activity, US Army Security Agency Test and Evlauation Command, and Area Frequency Coordinator under the Chief of Communications-Electronics to the fort.[45]

The post renewed its request for funds to tap Garden and Huachuca canyons spring supplies in September, 1966. In fact, the post commander, Major General B. H. Pochyla, had two Military Construction Line Item Data sheets prepared. One suggested essentially the same project as had Col. Seigler in 1963, and at the same cost ($1.197 million); the second added additional sewage treatment and pumping facilities to enable the post to use treated effluent water for irrigation, at a cost of $1.754 million. Major General Pochyla's requests drew heavily on the language and statistics presented earlier by Col. Seigler.[46]

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[43]Fort Huachuca, Arizona: History, 1974, p. 10. 10-0153

[44]Press Release, US Senate Committee on Appropriations, 4-13-1966. Hayden Collection, 275:119, Arizona Collection, ASU, 20-0025.

[45]Headquarters, US Army Garrison, Fort Huachuca, Arizona, "Fact Sheet," 10-1968. Arizona Collection, HM-60, ASU, 20-0136.

[46]"Military Construction Line Item Data," two sets, both dated 9-15-1966, prepared by Major General B. H. Pochyla. Hayden Collection,

Senator Hayden's staffer, Roy Elson, met with Sam Sage, deputy post engineer and two officials of the Army Material Command about the fort's water development plan in March 1967. Sage and the two officials believed that the program would be in upcoming plans and at a high priority. "Sage further remarked that when the project was first proposed in 1965 [actually 1963, see above], it was estimated that Ft. Huachuca would face a critical water shortage by 1970. Ft. Huachuca has experienced a buildup not foreseen in 1965, especially with the 6,000 new troops added last year and and with the transfer of the Strategic Communications Command this year." Sage believed that it was crucial, given the increased demand, to get the project underway.[47] In June Hayden was informed that the water development project would "definitely" be in FY 1969 Military Construction Authorization. It was not in FY 1968 because the Corps of Engineers had not developed plans for the project.[48]

STRATCOM Arrives, 1967

The Army moved a major new unit into the post in April 1967. This was USA Strategic Communications Command (STRATCOM), which took command of the fort from the USAEPG that July. The USAEPG then became a tenant unit under STRATCOM. STRATCOM as a command answered directly to the Army Chief of Staff, on the same level as other major field commands such as the Continental Army Command or Army Material Command. The 11th Signal Group also came under STRATCOM's command, providing "transportable communications facilities for quick installation in emergency anywhere in the world." It was also at this time that the US Army Garrison Fort Huachuca was created as a subcommand of STRATCOM to handle the day-to-day operations at the fort, including police and fire protection, food services, maintenance,

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306:20, Arizona Collection, ASU, 20-0013 and 20-0014.

[47]JAF to Carl Hayden, 3-28-1967, "Memorandum for Senator Hayden re: Water Development Program for Ft. Huachuca." Hayden Collection, 306:20, Arizona Collection, ASU, 20-0017.

[48]JAF to files, 6-26-1967, "Re: Ft. Huachuca Water Development." Hayden Collection, 306:20, Arizona Collection, ASU, 20-0018.

and providing 3 million gallons of water per day.[49]

Folsom Moore praised STRATCOM's arrival highly to Carl Hayden. He noted that "we are very much on the main line," and no longer downgraded as had been the case after Robert McNamara became secretary of defense. Moore saw the FY 69 military construction program, "which is now on the desk of the Chief of Engineers, and which will go to Congress before the first of January, 1968 ... Fort Huachuca has top priority; there is no question of its importance." He added that water development was first on the list of priorities, followed by a complex of five barracks, an academic building for the Combat Surveillance School, barracks for hospital enlisted personnel, and other facilities. "The Fort Huachuca items will be coming before Congress for the first time in many years," noted Moore, "without you having to ask for them."[50] In August the Phoenix press evaluated STRATCOM's impact on Sierra Vista, observing that its arrival in June stimulated construction of 200 new homes, new sewers, and public amenities like a public swimming pool and city park. New businesses also arose in the city. STRATCOM in 1967 added 900 to Fort Huachuca's population.[51]

The water supply problem continued to plague the post, made potentially worse with STRATCOM as a new tenant. As Folsom Moore noted, water development was a high priority item, the top on a revised list of MCA projects for FYs 1969-1973. The post commander, Col. N. C. Angel, submitted another "Military Construction Line Item Data" application for "Water Development Canyons and Water Conservation." Like General Pochyla's before him, this application borrowed heavily from language in the January

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[49]Hq, USA Garrison, Fort Huachuca, "Fact Sheet," October 1968. HM-60 Fact Sheet, Arizona Collection, ASU, 20-0136; Sierra Vista Printers, *Unofficial Guide to Fort Huachuca*, 1968, pp. 7-8. Arizona Collection, HM-63, ASU, 20-0139.

[50]Folsom Moore to Carl Hayden, 7-2-1967. Hayden Collection, 295/150 #8, Arizona Collection, ASU, 20-0131.

[51]*The Arizona Republic*, August 13, 1967, "STRATCOM Comes to Sierra Vista."

1963 application prepared by Col. Seigler, particularly in terms of statistics and description of the problem facing the post. However, it differed in several important aspects. First, Col. Angel proposed that treated sewage effluent be drawn from new oxidation ponds, delivered by a 1000 gpm pump, and used as irrigation water for the post lawns, landscaping and golf course. Second, Col. Angel's figures for current system capacity were different. In 1963, Seigler stated that the system could produce 4.2 million gallons per day (mgd); Angel stated that the system in 1967 could produce 5.6 mgd with all wells and booster pumps working around the clock. Both estimated that the springs in Garden and Huachuca canyons would provide about 1 mgd (Seigler thought a monthly average of 30.25 mg, Angel 1 mgd). Like Seigler, Angel noted that Sierra Vista pumped 1.4 mgd. The combination of increased pumping at the fort and in the adjacent town meant that "the installation is constantly drawing upon a steadily decreasing resource at a steadily increasing rate." In the end this would mean "complete depletion of a critical natural resource." However, by 1967 the cost of the project, with the additional feature of reclaimed water for landscape irrigation, rose to $1.754 million (up from $1.197 million in 1963). Col. Angel presented a table (see table next page) showing the previous eleven years' annual use, average daily use, and maximum daily use.[52]

The post MCA program shown Senator Hayden in July, 1967, ranged from $14.48 million in FY 1969, $1.8 million in FY 1970, $5 million in FY 1971, $3.45 million in FY 1972, and $3.74 million in FY 1973. Besides the water development and reclamation project mentioned above, plans called for, among other things, five additional barracks, a 40 man BOQ, a new commissary, enlisted men's service club, post library, a variety of shops and maintenance facilities, warehouses, road and street extensions, a baseball field and 2,000 seat stadium, and automatic irrigation systems at

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[52]"Military Construction Line Item Data," 4-24-1967, prepared by Col. N. C. Angel. Hayden Collection, 306/25 #9, Arizona Collection, ASU, 20-0126; "Military Construction Line Item Data," January 1963, Prepared by Col. T. J. Seigler. Hayden Collection, 275/118 #4, Arizona Collection, ASU, 20-0130.

a variety of places around the post.[53]

Water Consumption at Fort Huachuca, 1956-1966
[in millions of gallons][54]

Year:	*Average Day*	*Maximum Day*	*Year Total*	*Population**
1956	1.226	2.622	447.005	7,086
1957	1.524	3.207	556.121	8,800
1958	1.874	3.460	683.968	11,000
1959	2.055	3.540	750.228	
1960	2.200	4.205	802.806	13,117
1961	2.250	3.990	821.217	13,296
1962	2.476	4.461	903.730	11,326
1963	2.187	4.416	798.217	12,000
1964	2.115	4.020	771.858	
1965	2.530	3.580	912.366	
1966	2.398	4.464	863.532	

*[Population statistics were derived from available estimates, letters, fact sheets, reports, and other sources taken at different times of the year, independent of water consumption figures, and are included for comparison only.]

What was requested and what was eventually authorized and for which funds were appropriated were often not the same. In March 1968, Folsom Moore, tireless promoter of the fort, devoted three separate letters on the same day to Hayden on three important subjects. First, he advised Senator Hayden that what he had hoped would be an eight-barrack complex had been reduced to three, and he hoped that with Hayden's influence they might be able to raise the project to five barracks. Troops were being housed in 1942 mobilization barracks because of a lack of modern quarters. "The five Barrack complex will go a long way to providing adequate housing for permanent personnel at Fort Huachuca. It leaves some seven or eight

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[53]"Revised FY 1969 - 1973 Fort Huachuca MCA Program," 7-19-1967. Hayden Collection, 306/25 #9, Arizona Collection, ASU, 20-0125.

[54]Fort Huachuca, "Water Development Canyons and Water Conservation," Military Contruction Line Item Data, 4-24-1967, section C.1. Hayden Collection, 306/25 #9, Arizona Collection, ASU, 20-0126. This project line item was for $1.754 million.

other Barrack buildings for future construction, but only three of these are for the present permanent personnel." To Moore, the more permanent developments could be built on post, the less likely that the Defense Department would deactivate or close the post. Closure would be economically devastating to southeastern Arizona.[55]

Moore's second letter stressed the need for water development -- "at Fort Huachuca it is of supreme importance." By 1968 the post had a population of 20,000, "and it is growing." Moore noted that the USGS had made an "exhaustive survey," but he placed more faith in the comments of local well drillers who believed that wells near the North Gate in the Babocomari Valley "will provide all the water that may be needed at Fort Huachuca." The USGS's proposed dams collecting spring water in the canyons were alright, Moore said, "but I want a permanent water supply."[56] His last letter urged Hayden to support a 40 man BOQ for the fort. "There is an immediate need at Fort Huachuca for six BOQs; there are two." Most of the single officers lived off post. He urged that money be added to an FY 1966 appropriation allowing for a 24 man BOQ (yet unbuilt) so that it could be increased to 40.[57] However, later that year the commander of STRATCOM stressed the need for the canyon system and sewage lagoons, advising senators Hayden and Fannon that it was "the first priority item." In his notes the commander stated:

> The dollar value of this project is $1,750,000. It consists essentially of the construction of cut-off dams with infiltration galleries and collection piping. The dams are essentially below the surface, extending from the stream bed level in both Huachuca and Garden canyons down to bedrock. This item is essential to provide additional water resources for domestic and irrigational use at Ft. Huachuca. The conservation and utilization of the water resources of these two canyons will

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[55]Folsom Moore to Carl Hayden, 3-14-1968. Hayden Collection, 306/#23, Arizona Collection, ASU, 20-0121.

[56]Folsom Moore to Carl Hayden, 3-14-1968. Hayden Collection, 306/#23, Arizona Collection, ASU, 20-0122.

[57]Folsom Moore to Carl Hayden, 3-14-1968. Hayden Collection, 306/#23, Arizona Collection, ASU, 20-0123.

> reduce the amount of water withdrawn from the diminishing underground water basin. This conservation not only effects Ft. Huachuca but has a corresponding impact on the surrounding communities in that the water resources of Sierra Vista and Huachuca City are supplied from generally the same underground basin. Since 1959 the static level of the water basin has lowered some 19 feet and the rate of annual fall is increasing.[58]

The spring water collection project went forward in 1969. Zurn Engineers oversaw construction, which took place between July 21, 1969 and June 12, 1970. The project called for a 12 inch steel line from the Garden Canyon springs to the 1.5 million gallon reservoir; an 8 inch line conducted water from Huachuca Canyon springs to the Old Post reservoirs. At the same time, the post replaced the old line running from wells No. 1 and No. 2 with a new, slightly larger 12 inch line connecting to the Garden Canyon system. The old line was left to connect only the 1.5 million gallon reservoir with the Old Post reservoirs.[59]

The water situation was put under further pressure between 1969 and 1971 with the arrival or creation of five major units: Safeguard Communications Agency (SAFCA, 1969); US Army Communications-Electronics Engineering Installation Agency (CEEIA) (1970); US Army Combat Surveillance and Electronic Warfare School (1970); and most important, the US Army Intelligence Center and School (USAICS) (1971, transferred to Fort Huachuca from Fort Holabird, Maryland)

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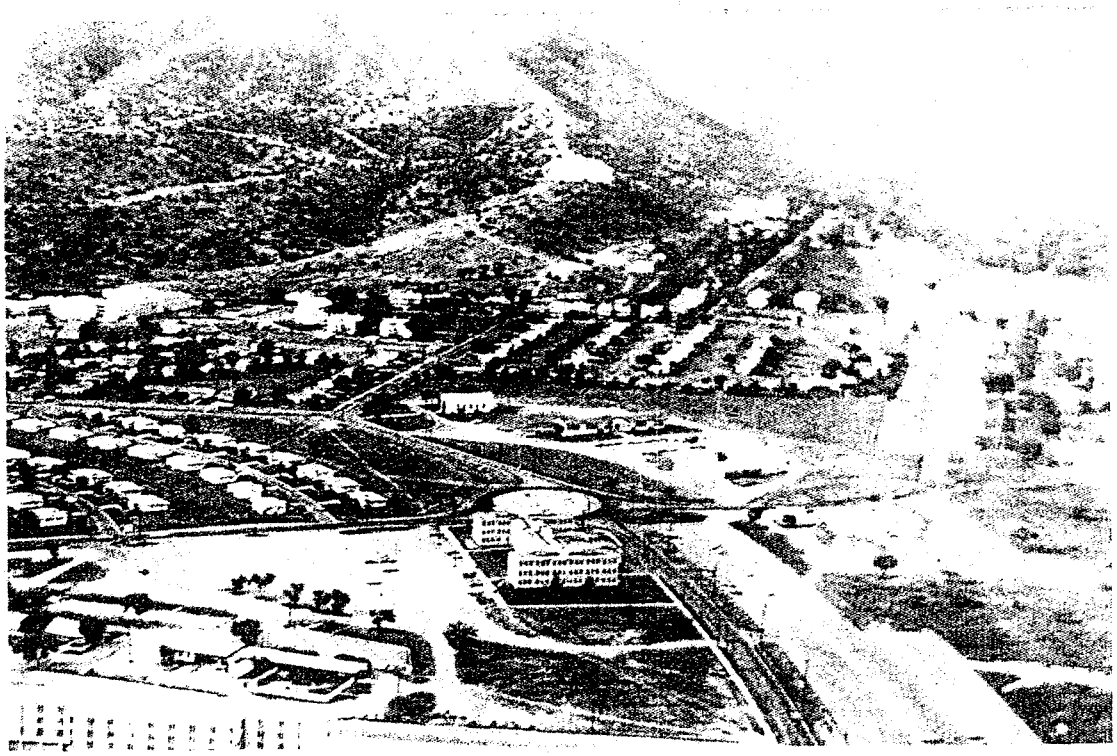
[58]STRATCOM Command [?], "Fort Huachuca 5-Year MCA Program," ca. 1967. Hayden Collection, 306/#23 MCA Req, Arizona Collection, ASU, 20-0124.

[59]Robert L. Hansen, project engineer, Daily Construction Log, July 21, 1969 to June 12, 1970. Construction Records, Fort Huachuca. FARC Los Angeles, Accession Number 73-1067, 06-0001; Blanton & Co., Architects and Engineers, Tucson. "Investigation and Recommendations for Upgrading the Water System at Fort Huachuca, Arizona." Part II. Prepared for the Corps of Engineers, Sacramento District, February 1973. Appendix 3 in US Army Corps of Engineers, *Report on Water Supply, For Huachuca and Vicinity, Arizona, Appendixes.* March 29, 1974. Fort Huacchuca DEH, pp. 3-II-3 and 3-II-4.



Aerial view of Old Post area, 1970. New housing units and USAEPG buildings visible in foreground.

SAFCA was responsible for developing and maintaining the communications system for the SAFEGUARD missile system. It was reorganized and renamed the Ballistic Missile Defense Communications Activity (BMDCA) in July of 1975.[60] The BMDCA oversaw the installation and operation of intrasite and intersite communication systems for support of ballistic missile projects. BMDCA was also responsible for testing the resilience of their systems.[61]

Communications-Electronics Engineering Agency (CEEIA) was responsible for the engineering development of communications systems and communications safeguards. This involved the development of new communications systems utilizing radio, telephone, and television media, and both electronic and physical safeguards for communications systems used by the armed forces.[62] CEEIA directed operations for research and development of satellite and microwave communications systems, airfield navigation systems, construction of protective devices for communications systems, and radio, telephone, and television transmission and reception systems. Together with this research and development, CEEIA supervised installation, maintenance, and management of communications systems around the world.[63]

The U.S. Army Intelligence Center and School (USAICS) moved to Fort Huachuca in 1971.[64] In 1973 USAICS merged with the Combat Developments Command Intelligence Agency, the Combat Surveillance and Electronic Warfare School, and the Sixth Army Training Aids Center, combining various functions of the component agencies under one command.[65] The duties of USAICS were divided into two functions. The first, Combat and Training

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[60]Headquarters, Fort Huachuca: 1975 History, p. 8. 10-0154

[61]Fort Huachuca, Arizona: History 1974, p. 9. 10-0157

[62]Fort Huachuca, Arizona: History, 1974, p. 9. 10-0157

[63]Fort Huachuca, Arizona: History 1974, p. 9. 10-0157

[64]Fort Huachuca, Arizona: History 1974, p. 10. 10-0157

[65]Fort Huachuca, Arizona: Histroy 1974, p. 10. 10-0157

Developments, is determination of future requirements for combat and specialist intelligence systems in support of the army in the field. Six combat development programs within this function included Organization, Training Literature, Management Information Systems, Studies, User Experiments and Tests, and Material Requirements. The second, Training and Education, developed, implemented, directed, and managed USAICS training programs of determined intelligence requirements. Academic training was offered to military personnel in the fields of Combat, Intelligence, Strategic Intelligence, Counterintelligence, and Combat Surveillance. USAICS offered basic and advanced training for officers in Intelligence and Aerial Surveillance (radar, navigation, etc.). USAICS also offered basic courses to non-commissioned officers, as well as a Training Support Program designed for the National Guard and Army Reserve. USAICS was not only responsible for training the U.S. Army, but also instructed personnel from the Department of Defense and selected civilian and military personnel from foreign nations in four resident programs: Tactical Intelligence and Military Science, Exploitation and Counterintelligence, Aerial Surveillance, and Ground Sensors.[66]

The Annual Historical Review for Fort Huachuca for 1971 referred to the arrival of the USAICS and US Army Combat Development Command Intelligence Agency from Fort Holabird as "a major event of the past year." The move added 3,000 to the post population as compared to the previous December. "This population increase plus the construction of permanent type buildings was evidence of the increased importance of Fort Huachuca." It also pressed available facilities. "At year's end, important problems affecting the fort's future included a serious housing shortage, and concern about the water supply," observed the annual review. "The Facilities Engineer reported adequate water for current needs, but recommended continued emphasis on water conservation programs." The water system had to handle the new population, and feed new sets of housing and facilties, including 100 units of four bedroom housing and a new laundry and dry cleaning plant. Additional projects started in 1971 included another 100

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[66]Fort Huachuca, Arizona: History 1974, p. 11. 10-0173

units of three and four bedroom housing, a new service club, a religious education center, and new troops billet complex.[67]

The fort's wells produced water to supply the system. In 1971 the existing well production was:

Existing Well Production

Well #	Nameplate (in gpm)	1971 Observed (in gpm)
1	500	593
2	750	615
3	700	760
4	700	611
5	450 (throttled)	575
6	750	601
Total	3850	3162

In a 16 hour average day the wells pumped 3,035,520 gallons; on a 24 hour peak day they pumped 4,552,280.[68]

In April, 1972, Lt. Col. McK. Roper, Jr., LAD Engineer, with his legal staff, met with representatives of STRATCOM's commanding general and the post commander to discuss provisions of Arizona's groundwater code hand how they might affect the fort. In Roper's report to the division engineer on the meeting, he noted that because Fort Huachuca's wells produced domestic water, they were exempt from regulation by the state "under the administration of critical ground water areas established by the state. The rights of Fort Huachuca to the water produced on its wells [sic] are the rights in land of an owner thereof, and are not rights acquired by appropriation." He added,

> The water report recently prepared by the Sacramento District concludes that the existing supply of water at Fort Huachuca is sufficient for approximately 60 years based upon present population of the base or for 30 years based upon

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[67]Fort Huachuca Post Museum, "History, 1971," p. 1, 7. Fort Huachuca Post Museum, History Binder 1970-71, 10-0150.

[68]USAED Sacramento, Corps of Engineers, "Fort Huachuca, Arizona, Water Production Facilities, Final Analysis of Design," 24 July 1978, Part II, computation sheets, page 1 of 30. DEH Fort Huachuca.

> doubling existing population. This report further covers a recommendation for monitoring the water by the Army as to its own uses of water at Fort Huachuca and further recommends that any monitoring by local or state agencies of water uses outside of Fort Huachuca will be noted and considered in connection with the monitoring done by the fort.

The conferees agreed that the fort should not join in any joint regulatory system with local agencies as to production or monitoring of the wells, "in view of the Army's ownership of the water underlying Fort Huachuca." Neither the fort nor Sierra Vista were in a critical water area, nor were their wells used for irrigation.[69]

Between 1972 and 1974 the fort, in conjunction with the Los Angeles District, Sacramento District, Arizona Water Commission, and outside contractors, undertook an evaluation of its groundwater resources. Blanton & Co., architects and engineers from Tucson, prepared two reports on the fort for the Sacramento District. The first was "Investigation and Recommendations for Upgrading the Water System at Fort Huachuca, Arizona," submitted in February 1973. Blanton started with several assumptions, the first being that the post's population would remain stable. They noted that during the previous year a test well (Test Well #5) in the East Range could produce 1.44 mgd on a 16 hour schedule. They also noted that the new system to use treated effluent for irrigation on the post golf course and Chaffee Parade Ground would be helpful in easing irrigation demand; potable water would continued to be used on the 90 acres of public grounds and 150 acres of private landscaped grounds, accounting for an increase of 2.0 mgd during the irrigation season in May and June. June 30, 1972, was the maximum day recorded, with a demand of 5.34 mg. While water from the canyon springs would be helpful, they would not solve the problem. Additional storage and other efforts would help, but not solve, the water problem at the fort. "The deficit on the basis of 16 hour pumping of wells is 5.0 mgd - 3.49 mgd = 1.51 mgd. Additional sources of water therefore

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[69]Lt. Col. McK. Roper Jr., to South Pacific Division Engineer, 4-24-1972. 1502-13 Fort Huachuca, AZ, General Correspondence, Box 61. Corps of Engineers, Arizona Real Estate Office, .

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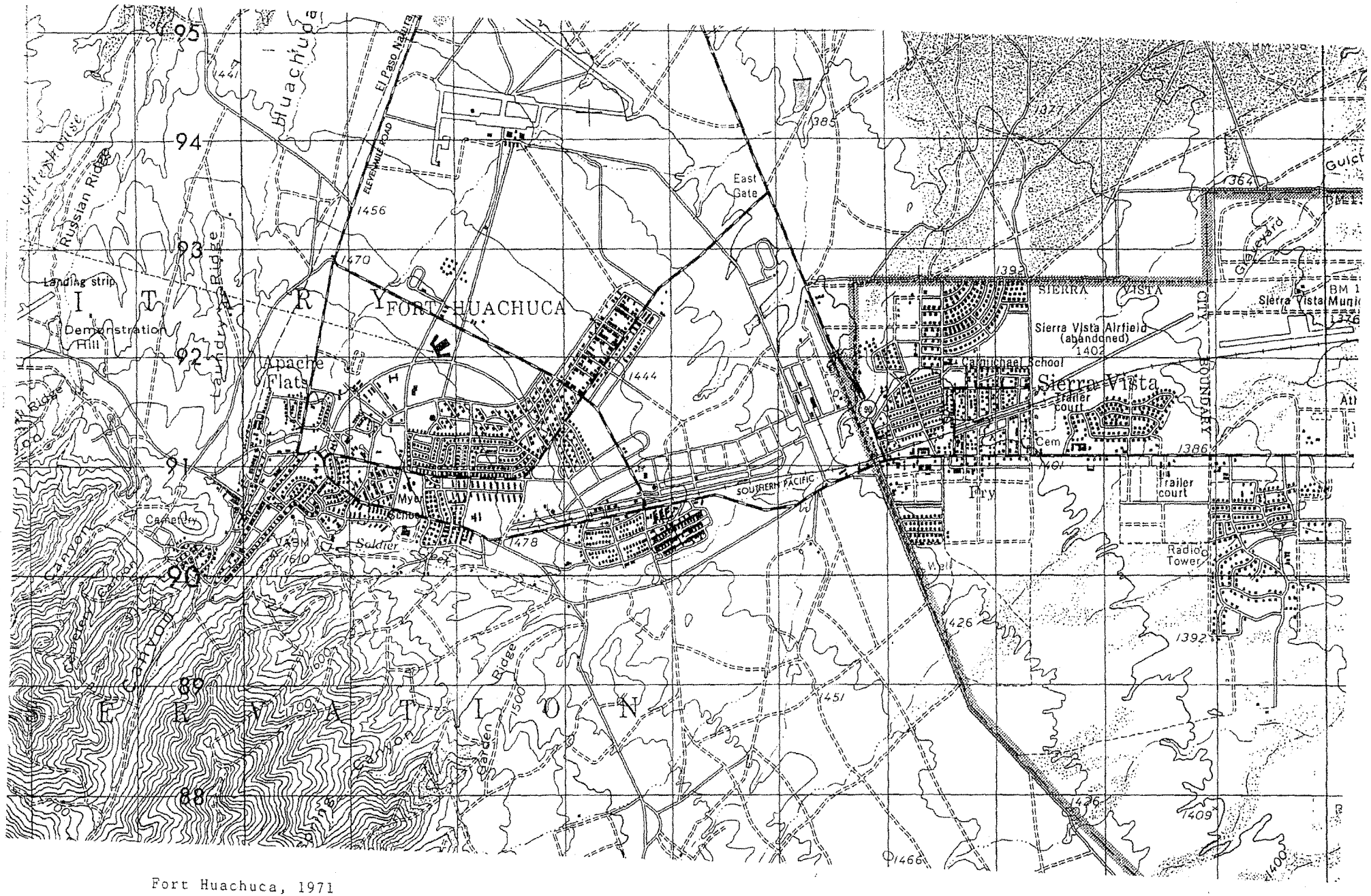

Fort Huachuca, 1971

USFH-00002718

need to be introduced as soon as practicable."[70]

Blanton submitted this report as an addendum to a "Concept Design Report for Proposed Water System Expansion Fort Huachuca, Arizona," in January 1974. They reported that post normal daily per capita use was 220 gpd, 330 gpd in maximum months. "This figure is higher than is usually thought to be normal," a more common level being 200 gpd per capita. Existing wells could deliver 3090 gpm, but "this is not sufficient to deliver the 4.613 million gallons per day presently used during the month of May even when pumping is continuous for the enitre 24 hours." Blanton noted that proposed wells in the East Range had a capacity of 11,500 gpm.[71]

During that same year the Sacramento District prepared a report on test wells and hydrolgeological conditions at the post, particularly in the East Range. The report represented part of an on-going study begun in 1970, done in conjunction with the agencies mentioned earlier. The test wells drilled during the study showed that the East Range aquifer was flat. Of the four areas with potential groundwater supplies to tap, only that in the East Range was worth consideration. The others (north of Libby Field, the existing well field, or between the well field and Garden Canyon) were either too far away or too likely to be impacted by other development. The study suggested that a well field in the East Range could supply a post population of 50,000. The need for new wells was increased because post well No. 5 was deteriorating and perhaps beginning to fail, and that wells No. 1 and 2 were becoming of questional reliability. The report recommended that the post place Test Well #5 into production, and

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[70]Blanton & Co., "Investigation and Recommendations for Upgrading the Water System at Fort Huachuca, Arizona, Part II," February 1973, pp. 1-11, 41, 60. Appendix 3 in "Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Appendixes, USA LAD 3-29-1974.

[71]Blanton & Co., "Concept Design Report for Proposed Water System Expansion Fort Huachuca, Arizona, Part I," January 1974, pp. 1-5. Appendix 3 in "Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Appendixes, USA LAD 3-29-1974.

gradually phase out use of present post wells No. 2 and 5.[72]

The Arizona Water Commission also prepared a report on the fort's water supply. The commission noted that as of 1940 the inflow and outflow of the aquifer was roughly equal, but that in the years since pumping had increased. Between 1960 and 1967 the post pumped 2600 acre feet per year [af/y]; 1967-1973 this rose to 3300 af/y. At the same time, off-post puming had risen from 300 af/y between 1954 and 1960, to 900 af/y between 1960 and 1968, to 1200 af/y between 1968 and 1973. On the post, between 1940 and 1973, the commission estimated that 34,000 af had been pumped, lowering the aquifer 60 feet.[73]

In 1974 one of the two 500,000 gallon steel water tank towers was sold and demolished. It had stood near the corner of North Railroad Avenue and Irwin Street.[74] The post had plans for additional construction projects, continuing work on an another 100 units (20 two bedroom, 80 four bedroom of company and NCO grade) of housing, as well as barracks modernization and existing housing rehabilitation in 1975.[75]

During these years the army established two new organizations at the post, and redesignated STRATCOM as US Army Communications Command (USACC). The two new units were US Army Commercial Communications Office (USARCCO) and US Army Communications Management Information Systems Activity

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[72]Corps of Engineers, Sacramento District, "Fort Huachuca, Arizona, Supplemental Report: Test Well Drilling and Study of Hydogeological Conditions," January 1974, pp. 1-15. Appendix 4 in "Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Appendixes, USA LAD 3-29-1974.

[73]Arizona Water Commission, "Status Report of a Study of the Adequacy of the Water Supply of the Fort Huachuca Area, Arizona," March 18, 1974, pp. 1-2, 4, 18-20. Appendix 2 in "Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Appendixes, USA LAD 3-29-1974.

[74]Fort Huachuca Post Museum, "Fort Huachuca, Arizona, History, 1974," p. 41. Fort Huachuca Post Museum, History Binder 1974, 10-0153. This tower may not have been operative for some time before its demolition. A schematic of the water system ca. 1966 showed only one 500,000 gallon tank in use.

[75]Fort Huachuca Post Museum, "Headquarters Fort Huachuca 1975 History," p. 34. Fort Huachuca Post Museum, History Binder 1975, 10-0154.

(USACOMISA). The army established USARCCO to administer leasing commercial communications systems and facilities to augment its own systems. The unit was provisionally initiated in November of 1974 as a USACC Headquarters field operating activity, and became an active unit in February 1975.[76] The army assigned USARCCO what had been the function of Telecommunications Certification Office, including ensuring that specific telecommunication services and facilities leased from commercial carriers were true, secure, and suitable for use by the Army. UASRRCO also administered contracts for leased services and facilities, and certified to the Defense Communications Agency leasing department that the U.S. Army would adhere to contract payment schedules. The office also provided management and policy procedure regarding the Army's global leased communications system's rules, regulations, and standards.[77] USACOMISA was a branch of USACC established in February of 1975 as a USACC field operation. Supervised by the Management Information Systems Office, USACOMISA provided centralized automatic data processing support at Fort Huachuca. USACOMISA activities included systems analysis, design, and development and operation of Management Information Systems. Thus by January 1976 the USACC had under its command USARCCO, USACOMISA, the BMDCA (descendent of SAFCA), 11th Signal Group, CEEIA, and several other smaller commands, with a total authorized stength of 3,673. The various offices of the Fort Huachuca Garrison Headquarters had an authorized strength of 2,107, and the various tenant elements (USAEPG, USAICS, hospital and dental services, and other smaller units) contributed to the post total an authorized strength of 2,816. Another 6,139 dependents lived on post. The total post population was 16,625.[78]

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[76]Headquarters, Fort Huachuca, Arizona, 1977, p. 14. 10-0156

[77]Headquarters, Fort Huachuca, Arizona, 1977, p. 14.

[78]Fort Huachuca Post Museum, "Headquarters Fort Huachuca: 1976 History," post population appendix, 31 Jan 76. Fort Huachuca Post Museum, History Binder 1976, 10-0155.

In 1977 the post engineers undertook several water system repairs. In the late spring the 1.5 million gallon reservoir was "structurally repaired." During the work Grierson Swimming Pool was employed as a makeshift surge tank for the system. The water system was also affected by the failure of pumps at Wells No. 5 and No. 6 "for most of the irrigation season." The garrison command ordered watering schedules restricted during the period the wells were out of service. Well No. 6 came back on line in mid-July and Well No. 5 in early September. In early October the water collection systems tapping springs and streamflows in Garden and Huachuca canyons were damaged by flood flows. By the end of 1977 the collection lines were still out of service, although Facilities Engineering anticipated they would be operable in January 1978.[80]

Conclusion

Fort Huachuca undertook consideration of several means to adjust its water supply system to the growth experienced between its reactivation in 1954 and 1978. These adjustments took the form of additional development of the Garden Canyon and Huachuca Canyon springs and the installation of new wells in the East Range. During this period the number of dwellings on the post grew dramatically, as did housing in barracks and BOQs, so the kind of domestic water use changed at the same time the numbers of those making use of post supplies grew. In its application of treated effluent for golf course and parade ground irrigation the fort demonstrated wise use of an available resource. It also was faced with replacing or refurbishing wells supplying potable water. Consequently, there were times during which the post restricted use, particularly for outside watering.

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[80]Fort Huachuca Post Museum, "Headquarters Fort Huachuca Arizona 1977," pp. 50-51. Fort Huachuca Post Museum, History Binder 1977, 10-0156.

APPENDICES

Water Consumption, Fort Huachuca
[in gallons per day]

Month	Year	Maximum	Minimum	Average	Ave/Capita	Sources
DEC	1942	2,603,000	1,119,000	2,124,500	103	Sp. & W1 thru 3
JAN	1943	2,126,900	n.a.	2,364,435	90	Sp. & W1 thru 4
FEB	1943					Sp. & W1 thru 3
MAR	1943					Sp. & W1 thru 4
APR	1943	2,554,000		1,681,000	141	Sp. & W1 thru 4
MAY	1943	2,989,000	1,441,000	2,322,000	103	Sp. & W1 thru 5*
JUN	1943	3,200,000	1,800,000	2,600,000	110	Sp. & W1 thru 5
JUL	1943	3,400,000	1,900,000	2,600,000	114	Sp. & W1 thru 5
AUG	1943	3,500,000	1,600,000	2,600,000	122	Sp. & W1 thru 5
SEP	1943	2,900,000	1,900,000	2,500,000	116	Sp. & W1 thru 5
OCT	1943	3,700,000	2,000,000	2,500,000	122	Sp. & W1 thru 5
NOV	1943	2,900,000	1,700,000	2,400,000	116	Sp. & W1 thru 5
DEC	1943	2,400,000	1,000,000	1,600,000	115	Sp. & W1 thru 5
JAN**	1944	2,702,000	608,000	1,815,000	88	Sp. & W1 thru 5
FEB	1944	1,312,073	637,073	883,553	144	Sp. & W1 thru 5
MAR	1944	1,612,503	651,503	922,903	138	Sp. & W1 thru 5
APR	1944	2,787,670	1,057,670	1,851,870	111	Sp. & W1 thru 5
MAY	1944	3,454,000	2,158,000	2,822,800	118	Sp. & W1 thru 5
JUN	1944	3,666,280	2,439,280	3,132,610	144	Sp. & W1 thru 5
JUL	1944	3,182,333	1,706,333	2,599,333	137	Sp. & W1 thru 5
AUG	1944	3,901,867	2,043,867	2,876,867	162	Sp. & W1 thru 5
SEP	1944	2,829,000	1,083,000	1,856,800	168	Sp. & W1 thru 5
OCT	1944	1,358,467	558,467	1,033,137	272	Sp. & W1 thru 5
NOV	1944	1,617,333	864,333	1,160,033	284	Sp. & W1 thru 5
DEC	1944	1,571,000	831,000	1,253,000	173***	Sp. & W1 thru 5

Sources: 02-0016 through 02-0040

*Virtually the entire water supply was pumped from wells because continuing drought conditions reduced the flow from springs to a negligible amount.

**Beginning in January 1944 only daily averages are reported for spring production. Overall maximum and minimum consumption figures were computed by adding well production to average daily spring yield.

***Drop in per capita consumption explained by cold weather and repair of leaking fixtures. It is interesting to note the average per capita use in the Tucson urban area from 1950 to 1968 was 160 g.p.d. The City of Phoenix reported a higher use in 1968 of about 225 g.p.d. per capita. [Faculty of the University of Arizona, Department of Hydrology and Water Resources, *Arizona: its People and Resources* (Tucson: University of Arizona Press, 1972), p. 112.]

Water Consumption, Fort Huachuca, 1956-1972, 1982-1989
[in millions of gallons][1]

Year:	*Average Day*	*Maximum Day*	*Year Total*	*Population**
1956	1.226	2.622	447.005	7,086 (173 gpd/c)**
1957	1.524	3.207	556.121	8,800
1958	1.874	3.460	683.968	11,000
1959	2.055	3.540	750.228	
1960	2.200	4.205	802.806	13,117
1961	2.250	3.990	821.217	13,296 (169 gpd/c)
1962	2.476	4.461	903.730	11,326
1963	2.187	4.416	798.217	12,000
1964	2.115	4.020	771.858	
1965	2.530	3.580	912.366	13,000 (192 gpd/c)
1966	2.398	4.464	863.532	
1967	2.363	5.16	862.625	16,000
1968	2.837	5.00	1,032.022	
1969***	2.930	5.02	1,068.446	
1970	2.724	5.30	994.367	
1971	****	5.22	****	
1972	****	5.34	****	

1973-1981: no figures found.

1982	2.44	****	891.502	
1983	2.58	****	937.042	
1984	2.74	****	1,000.780	16,154 (Jan.) 179 gpd/c
1985	2.67	****	972.903	
1986	2.59	****	944.207	
1987	2.03	****	740.676	
1988	2.86	****	1,043.198	
1989	2.32	****	847.522	

* [Population statistics derived from estimates, letters, fact sheets, reports, and other sources taken at different times of the year, independent of water consumption figures, and are included for comparison only.]
** [Gpd/c = gallons per day per capita.]
*** [Consumption passes height 1944 level.]
**** [Figures unavailable.]

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[1]Fort Huachuca, "Water Development Canyons and Water Conservation," Military Contruction Line Item Data, 4-24-1967, section C.1. Hayden Collection, 306/25 #9, Arizona Collection, ASU, 20-0126. This project line item was for $1.754 million. Annual well production figures for 1982-1989 contributed by Ft. Huachuca DEH, February 1990. 11-0082.

Fort Huachuca Post Returns
1877-1916

Date	No. of Men	No. of Horses
1877	130	82[1]
1878	117	107[2]
1879	89	48
1880	93	52
1881	90	53
1882	161	71
1883	205	142
1884	213	135
1885	304	217
1886	321	172
1887	321	260
1888	316	259
1889	295	182
1890	331	188
1891	222	108
1892	383	98
1893	362	95
1894	385	106
1895	268	*
1896	332	83
1897	401	204
1898	388	188
1899	305	204
1900	222	175
1901	107	99
1902	129	107
1903	226	188
1904	289	253
1905	279	258
1906	319	249
1907	291	253
1908	345	238
1909	155	119
1910	155	130
1911	528	508
1912	594	480
1913	728	*
1914	578	*
1915	852	641
1916	1,035	864

* Indicates that no records were available for these statistics.

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[1]This average is based on post returns from March and June, 1877.

[2]All figures, unless otherwise noted, are based on an average of post returns from January and June.

Fort Huachuca
Population Statistics

YEAR	POPULATION	% +/-	SIGNIFICANT EVENTS
1916 -- 1927		750 -- 1200[1]	
1928 -- 1931		750 -- 2000[2]	
1932 -- 1939		750 -- 1200[3]	
1940	5,500		WW II draft
1941	5,500	no change	US entry, WW II
1942	40,500	+636	
1943	40,500	no change	
1944	40,500	no change	
1945	20,250	-50	
1947			FH deactivated
1951	10,300	-49	Korean Conflict; FH reactivated
1952	10,300	no change	
1953			FH deactivated
1954	3,132[4]	-69	FH reactivated. US Army EPG arrives at FH
1955	7,301	+133	
1956	7,086	-2	
1957	8,800	+19	
1958	11,000	+25	
1960	13,117	+19	USASATEC arrives at FH
1961	13,296	1	
1962	11,326	-15	
1963	12,000	+6	Viet Nam
1964			USASTATC established at FH
1966			11th Signal Group and USAEWS arrive at FH
1967			STRATCOM headquarters relocates to FH
1968	19,000	+58	
1969			SAFCA inaugurated at FH
1971	17,519		STRATCOM redesignated USAICS
1972	17,726 (Jul)	+1	
	17,617 (Dec)	-.6	
1973	18,309 (Jan)	+3	
	18,056 (Jun)	-1	40th Signal Battalion activated at FH

1974	17,046 (Jan)	-5	
	16,786 (Jun)	-1	USARCCO established at FH. Viet Nam period ends
1975			USACOMISA established at FH
1976	16,625 (Jan)	-.9	
	16,160 (Jun)	-2	
1977	16,612 (Jan)	+2	
	16,592 (Jun)	-.1	
1978	16,827 (Jan)	+1	
	16,849 (Jun)	+.1	
1979	16,548 (Jan)	-.1	
	16,266 (Jun)	-.1	
1980	15,603 (Jan)	-4	
	15,549 (Jun)	-.3	
1984	16,154 (Jan)	+3	
	15,789 (Jun)	-2	

Statistics for Fort Huachuca population estimates were compiled from a variety of sources. Population figures for the period of 1916-1939 (not inclusive) are estimates from the Secretary of War Annual Reports of actual population based on an average number of troops stationed at the post. Information as to who was stationed at the post at these times was found in Reports of the Secretary of War, but no precise population statistics were given. Population statistics for the period of 1940-1969 (not inclusive) were derived from fact sheets, annual reports, and histories of Fort Huachuca. Statistics from the period of 1971-1984 (not inclusive) were collected from Fort Huachuca annual reports.

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[1]During this period the Tenth Cavalry occupied Fort Huachuca. The Tenth Cavalry consisted of 12 companies at an authorized strength of 100 men per company, although it was unusual for a company to be at full strength. The average true strength of a company varied between 60 - 100. Also during this period the troops occupying Fort Huachuca spent much of their time away from the post patrolling the Mexican border, so that full

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Regiments were not at the post all at the same time.

[2]The Tenth Cavalry and the Twenty-Fifth Infantry occupied Fort Huachuca at this time. Troops from the post continued border patrols along the Mexican boundary. Regiments consisted of 10 - 12 companies at an authorized strength of 100 men, but this full strength was not often accomplished. The post did not host these troops all at once.

[3]At this time Fort Huachuca was host to the Twenty-Fifth Infantry Regiment, which was made up of 10 - 12 companies averaging 60 - 100 men per company. The Twenty-Fifth was the only occupant of the post. Troops from the post continued the Mexican border patrols during this time, therefore the post was not fully occupied at any one time.

[4]1954 -- 1957 figures indicate the population of military and civilian personnel only and do not include dependents.

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_____. Records of the Office of Quartermaster General; Record Group 92, National Archives Cartographic Section, Washington, DC.

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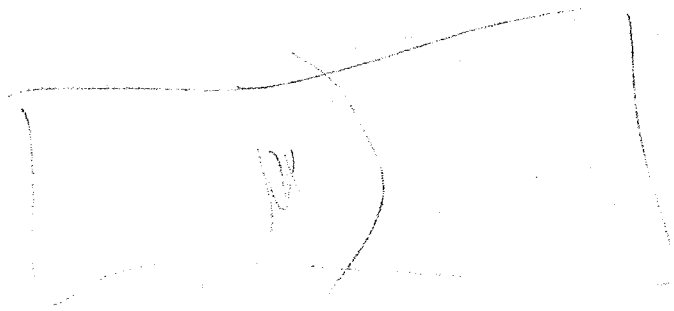
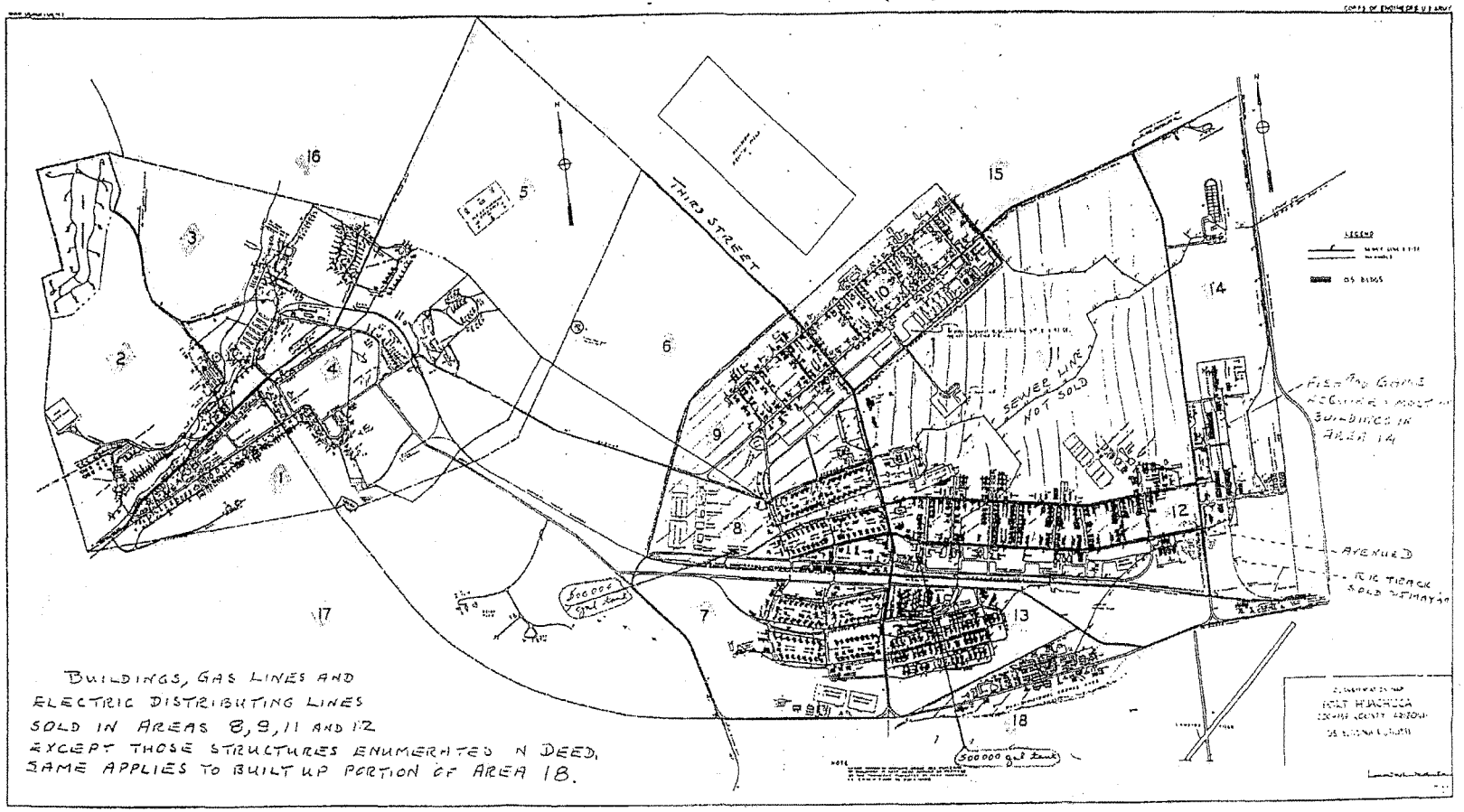
United States. Department of the Army. Military Division of the Pacific and Department of California. Map of Fort Huachuca, A.T. As Proposed to be laid out by Col. J. C. Kelton. From the sketches of 1st Sergeant Ryan, "K" 1st Infantry, October, 1881.





Areas 1 - 18, Fort Huachuca; note at left refers to sales by WAA and State of Arizona.

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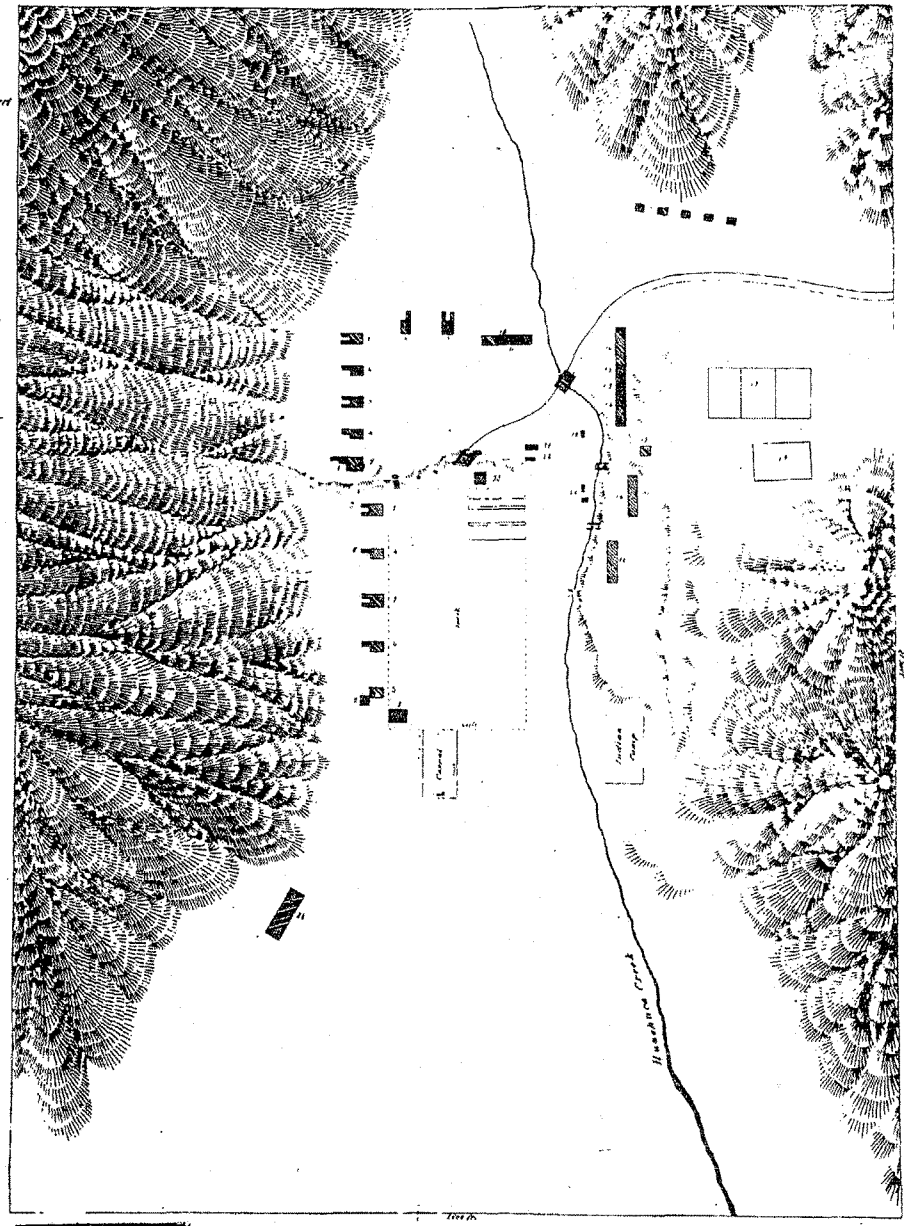
Legend.

- No 1. Hospital for two Companies, easily converted into a four Company Hospital.
- No 2. Chapel, to be incorporated with:-
- No 3. Quarters for Field Officer or Post Surgeon.
- No 4. Quarters for one Captain.
- No 5. " " two Lieutenants.
- No 6. Small Adobe to be used as a Kitchen for a Captains Quarters.
- No 7. Small Adobe to be used as Kitchen & Servant's room for Quarters for two Lieutenants.
- No 8. Small Adobe to be used as a Kitchen for:-
- No 9. Post Commander's Quarters.
- No 10. Post Trader's, to be converted into:-
- No 11. Q. M. & Comm^t Store House.
- No 12. Laundress' Quarters.
- No 13. Boarding-house, to be incorporated with:-
- No 14. Cavalry Barracks.
- No 15. Guard house.
- No 16. Barracks.
- No 17. Cavalry corrals.
- No 18. Q.M. Corral, Hay & Wood.
- No 19. Store.
- No 20. Kitchens.
- No 21. Granary.
- No 22. Bakery.
- No 23. Post Adjutant's Office.
- No 24. Boarding-house.
- Existing Buildings.
- Proposed new Buildings.

Area :- 208.907 Acres.



MAP
OF
CAMP HUACHUCA,
A.T.

As proposed to be laid out
by
Col^l J. C. Kelton,
Assistant Adjutant General,
Mil. Div. of the Pac. and Dep^t of Cal.

from sketches by,
1st Sergeant Ryan,
C^o K^o 12^d Infantry.

OCTOBER 1881.

ENGINEER OFFICE,
Hdqrs. Mil. Div. of the Pac. and Dept. of Cal.
PRESIDIO OF SAN FRANCISCO, CAL.
NOVEMBER 1881.

W. A. Jones
Captain of Engineers,
Engineer Officer.

Traced by C. Winstanley, Topographical Assistant.

360 C

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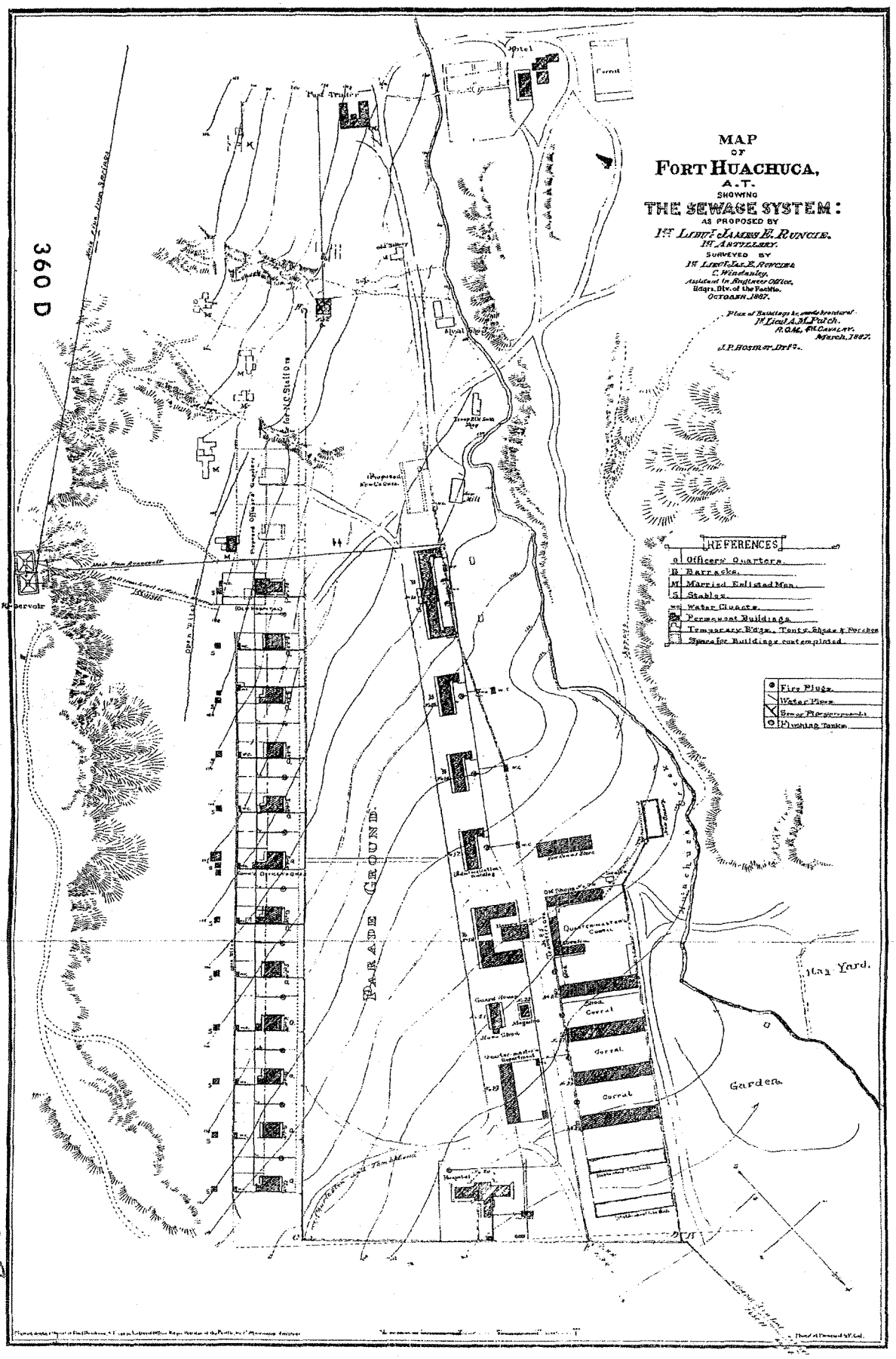

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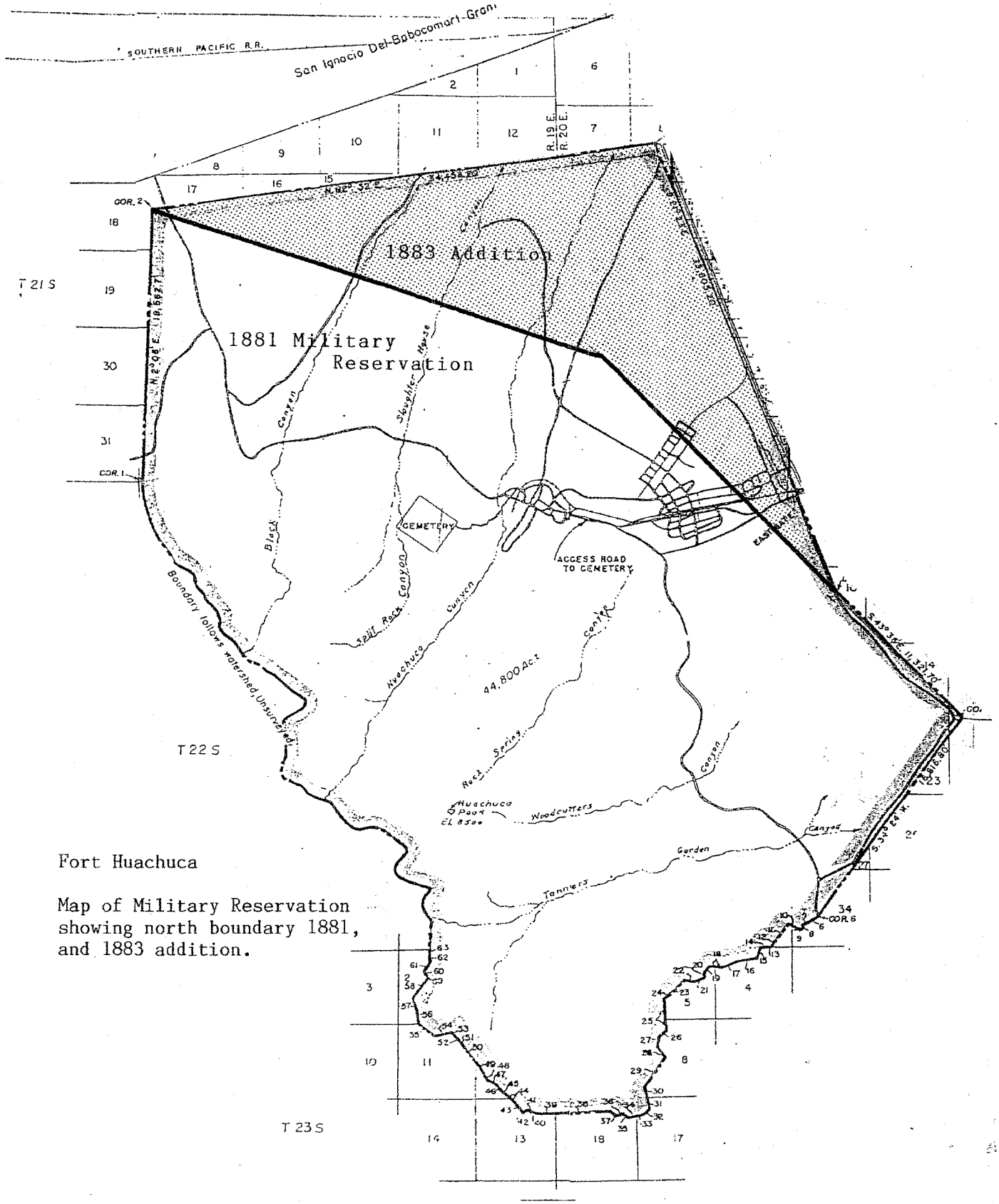
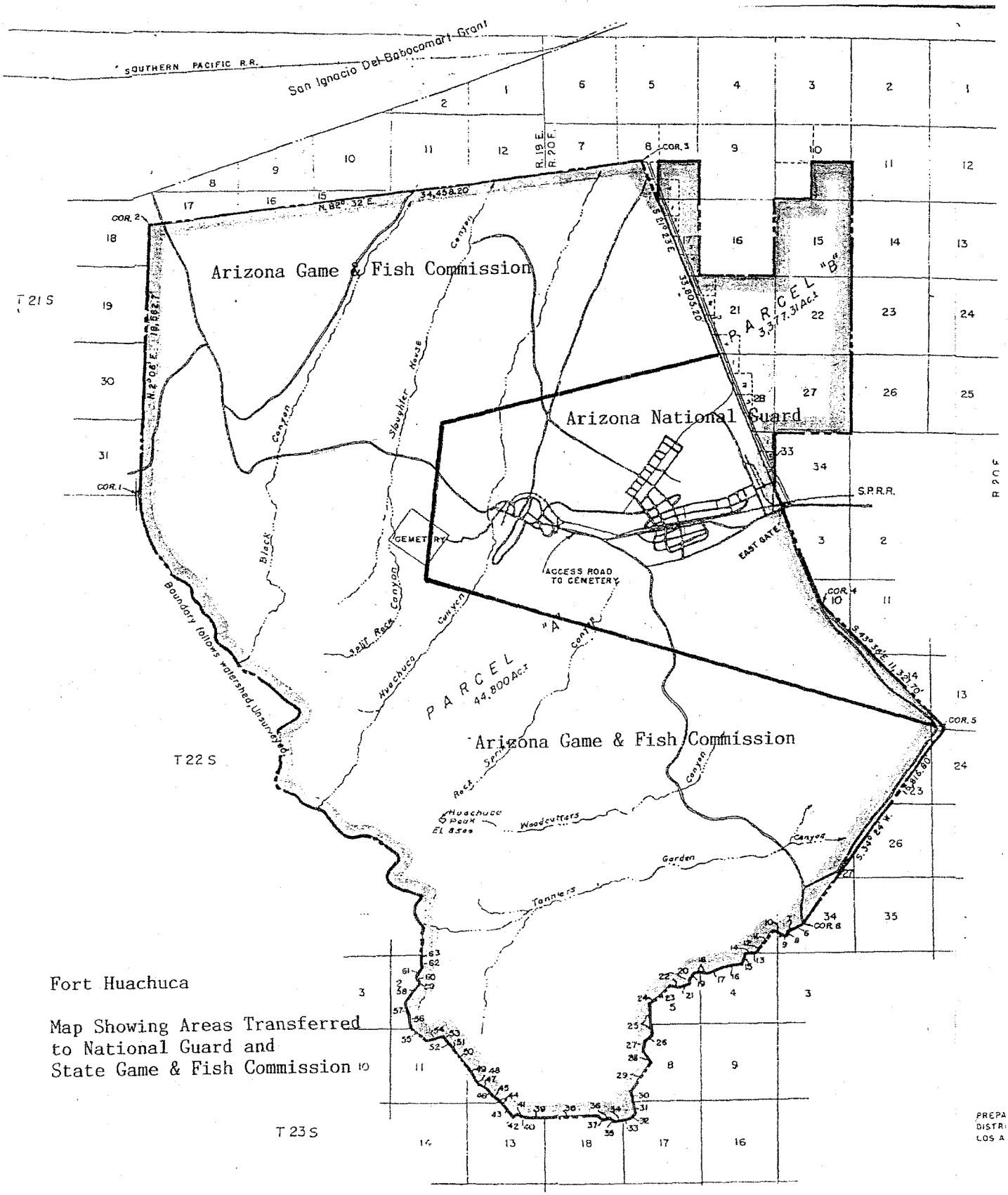


Fort Huachuca

Map of Military Reservation showing north boundary 1881, and 1883 addition.



Fort Huachuca

Map Showing Areas Transferred to National Guard and State Game & Fish Commission