



Boise's Water

*The Private
Side Of
Public Works*

*Robert T. Kent
Boise State University*

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BOISE STATE UNIVERSITY



Stock certificate logo, 1915

In 1900, during a legal battle with the City of Boise over charges for water used for fire protection, the Artesian Hot and Cold Water Company disincorporated in Idaho and reincorporated in the state of West Virginia as the Boise Artesian Hot and Cold Water Company. In 1915, after the dispute was settled, the Boise Artesian Hot and Cold Water Company reincorporated in Idaho with no change in name or stockholders.

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EXECUTIVE SUMMARY

The history and development of Boise's water supply is typical of the national experience with the exception that Boise's water supply has remained under private ownership for more than 115 years. During the Progressive Era, the proportion of municipal-owned water companies in the United States increased from 43 percent to 68 percent and by 2006, municipalities owned approximately 85 percent of all water supply systems in the United States.¹ Boise is one of only a few major metropolitan areas where the water supply system has remained privately owned. Boise's citizens have long spurned municipal ownership of utilities including water, electricity, and transportation. Boise's anti-tax, pro-business nature, combined with Idaho's conservative legislation related to municipal funding, has contributed to the longevity of Boise's private water system. The fact that groundwater was easy to exploit and did not require major capital expenditures was paramount to the ability of local businessmen to develop a private water supply without the help of eastern capital or municipal financing.

During the 1870s and 1880s, there were numerous discussions in Boise concerning the need for a public water supply; however, no action was taken by the city. In 1889, the discussion over installing a publicly owned water supply system ended when the city granted a franchise to H. B. and B. M. Eastman to lay pipes in city streets and supply domestic water to the city. The franchise was not exclusive and a second private water company, The Artesian Water and Land Company, was authorized on July 10, 1890, to install water pipes in city streets and provide domestic water to the city. In 1891, the two companies merged to form the Artesian Hot and Cold Water Company Limited. The initial water sources for both water systems were springs and shallow artesian wells in the foothills above Boise. The Artesian Hot and Cold Water Company continued to expand as the city grew. Although many of the subdivisions adjacent to the city relied on individual water wells for each subdivision lot, some developers installed piped water systems for the residents. The water utility grew by purchasing many of these small water systems; frequently this was encouraged by the city and the Public Utilities Commission, due in part to poor or inadequate service provided by the small systems.

Urban historians have advanced various theories for municipal takeover of private water systems. Disagreement on water rates, refusal of private corporations to provide water to unprofitable sections of town, high rate of disease caused by unsanitary water, insufficient volume or pressure for fighting fires and the general rise in professional city management during the Progressive Era have all been advanced as causes of the decline in private ownership of utilities. Boiseans hotly debated all of these issues and

although Boise periodically considered municipal ownership of the water system, in each case the city took no action, or the taxpayers voted down the necessary bonds to finance the purchase of the system. This report traces the history of the water supply for the City of Boise, documents the growth of the water system, and discusses the controversial issues associated with municipal ownership.

PURPOSE AND SCOPE

The purpose of this project is to review the history of the water supply of the City of Boise and the historical trends in water supply ownership. It is focused with a view of providing information and background on the water system which the City can use in deliberations concerning municipal ownership. The scope of the project included research of the newspaper microfilm collection at Boise State University and the Idaho Historical Society, review of the 1890 to 1950 business records of the Boise Water Corporation at the Idaho State Archives, and the files of the Public Utility Commission. In addition, interviews were conducted with city and water company staff and others knowledgeable about some aspect of Boise's water supply. The research emphasizes the history of the water supply north of the Boise River, as this area was the historical Boise town-site. This research culminated in the preparation of this report in partial fulfillment of the requirements for a Master of Arts in History at Boise State University.

INTRODUCTION

Although the Boise area was well known to Indians, fur traders and early Oregon Trail pioneers, it was not until the United States military established an army post here that Boise City was founded. On January 14, 1863, the U.S. Secretary of War authorized a new military post on the Boise River and on July 4, 1863, Major Pinckney Lugenbeel chose the location of Fort Boise in the foothills above the Boise River valley. Several days later, seventeen individuals formed a private company and laid out the Boise town-site.² Most of the town lots were allocated to existing residents of the area. Major Lugenbeel was given three lots that he proposed to deed to his children "if the town ever becomes worth anything."³ The need to provide provisions to the fort and supplies to the mining camps in the Boise Basin and Owyhee County mines provided the impetus for Boise's early growth. By 1864, Boise's population was approximately 1,658 and on December 12, 1864, the Idaho Territorial Legislature voted to incorporate Boise City. At that time, the majority of Boise residents were not in favor of municipal government and the voters did not approve the charter. In 1866, the Territorial Legislature granted Boise a new charter; however, an anti-charter party won the city election and refused to initiate a government. In 1867, in order to meet the legal requirements to secure title to lots in the city, the citizens finally formed a functional city government. Boiseans' anti-tax, anti-municipal government attitude, which continues today, can be traced to the founding of the city.

During the mid-to late-1860s, wagon trains were arriving daily in Boise and the newspaper encouraged these people to stay because laborers were in short supply.⁴ After being exposed to the sagebrush and desert along the Oregon Trail, these early visitors to the Boise area frequently commented on the trees and greenery along the Boise River. However, the town-site itself was devoid of trees, and according to one 1865 visitor, the broad, level, treeless avenues were lined with warehouses, log cabins, and cottages and "remind one of a prairie town in Kansas or Iowa."⁵ Within a short period of time, however, Boise's streets were lined with newly planted trees and irrigated with water from privately owned canals. Visitors described the streets as "well shaded" and the homes were "standing in flowery enclosures kept green by streams of living water flowing down the streets."⁶

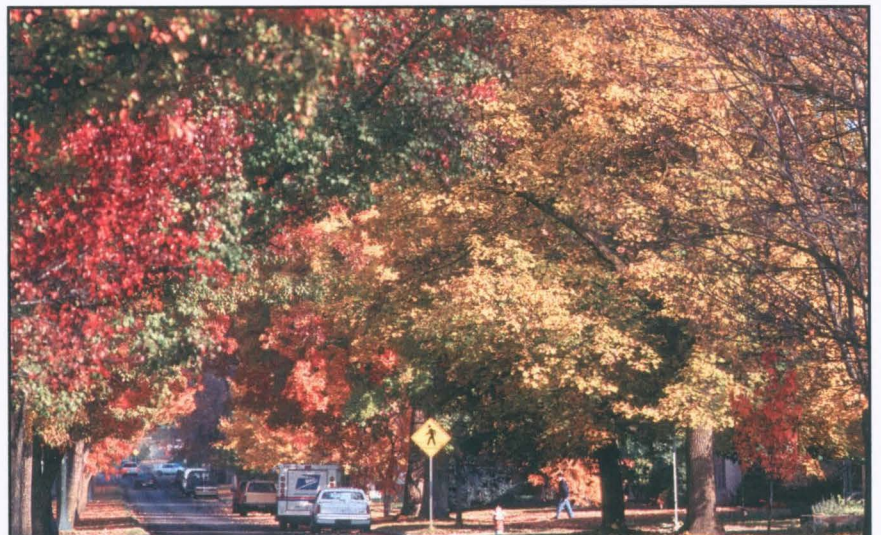
From 1863 through 1880, domestic water in Boise was supplied by individual wells, springs, irrigation ditches, and the Boise River. The first well in town was dug by William Thompson and John McClellan, who located their Boise valley land claim on May 28, 1863.⁷ In 1871, a local entrepreneur started drilling an artesian well on the Capitol Square using a cable tool drilling rig powered by a horse on a

treadmill. Due to insufficient power the horse was replaced by a steam engine, but for unknown reasons the well was never completed.⁸ In 1875, another private party attempted to drill an artesian well on the capitol grounds. This well was also abandoned due to the lack of proper drilling equipment.⁹

Several shallow public wells were dug in the downtown area and cisterns were constructed near irrigation ditches to hold water for fire fighting. Money to dig the wells was acquired by subscription or donations as was the common practice at the time. One well was located at the intersection of Eighth and Idaho streets and another at Sixth and Idaho streets.¹⁰ Two water storage tanks or cisterns were located near Grove and Ninth streets, another at Grove and Eighth streets, and another at Eleventh and Main streets. Although many contemporary Idaho cities (Silver City, Pocatello, and Idaho City) used water peddlers or carriers to provide domestic water, no specific reference to their use has been found in Boise. However, it is likely that Chinese immigrants played some role in providing domestic water to residences and businesses in Boise. Water carrier, vegetable peddler and domestic servant were occupations practiced by the Chinese in Silver City and Idaho City and there was a large Chinese population in Boise, many serving as domestic servants.¹¹

During the 1870s and 1880s there were numerous discussions in Boise concerning the need for a public water supply but the city took no action, primarily due to the reluctance of Boiseans to pay taxes for city services. Due to this anti-tax, libertarian attitude, local entrepreneurs provided most city services by investing in water companies, trolley systems, electricity generation and coal gas plants. Combined with an Idaho legislative requirement that two-thirds majority of the voters had to approve bonds for municipal financing, these services continued to remain privately owned.

Figure 1.
The "City of Trees" contrasts significantly with early travelers' view of Boise. (Photo courtesy of Boise Convention and Visitor's Bureau)



PUBLIC VERSUS PRIVATE OWNERSHIP

A supply of water was essential for towns to grow and city boosters took advantage of that fact. When Richmond, Virginia, was established in 1737, William Byrd advertised lots for sale with the claim "A town called Richmond, with streets 65 feet wide, in a pleasant and healthy situation and well supplied with springs of good water."¹² Often, public wells were constructed in public parks or streets. Once a critical population was reached, piped water systems were installed, frequently by individuals or private corporations. Private ownership was the norm until the late 1800s. During the Progressive Era the proportion of municipal-owned water companies in the United States increased to 68 percent, while Boise's water supply remained under private ownership.¹³

Although historians have advanced various theories for municipal takeover of private water systems, they are silent on why certain water systems remained under private ownership, or by default, they assumed that the factors identified in their research did not apply to the remaining privately owned systems. In some cases, city charters or lack of funds impeded municipal ownership. Although bonding capacity could influence a city's ability to finance water systems, Boise's bonding capacity was sufficient to fund city services if the citizens had approved the necessary taxes. In contrast, the private water supply system in Oakland, California, avoided takeover by the municipal government because the private company owned all of the available water rights.¹⁴ In other cases the private utility services area extended beyond the city limits, which prevented municipal takeover of the area outside the city's jurisdiction. During the municipalization trend of the Progressive Era, these conditions did not exist in Boise. Groundwater, which supplied a large portion of Boise's water, was not regulated and the water company's lines did not generally extend beyond the Boise city limits.¹⁵

Historian Carol MacGregor attributed the private utility ventures in Boise to "noblesse oblige" and discussed how the newly rich businessmen donated money to charities and invested in the infrastructure of the city.¹⁶ The concept of "noblesse oblige" or obligation of the nobility implies that the rich and wealthy have social obligations to the poor. Although wealthy Boise businessmen did donate to charities, their social obligations did not include contributions on such a large scale as the provision of free services or utilities. Boise and other western cities such as Portland, Spokane, and Seattle were built with private money, not eastern capital and "they developed because the citizens had the nerve and perseverance to invest their own money."¹⁷ In Boise, the Sonna Block, Pioneer Building, Falk Building and "our splendid water system" were constructed with private capital, "by men who live here and who made their

money here.”¹⁸ The theory of “noblesse oblige” does not explain why the initial water systems in Boise were privately owned, nor more importantly does it explain the longevity of private ownership of Boise’s water supply. Instead, the conclusion of the contemporary press in the late 1800s was that Boise’s businessmen were entrepreneurs and invested in ventures which they considered to be profitable.

Private water systems have provided water to Boise for more than 115 years and like many other cities, Boise has experienced controversy over the ownership of the water supply. Because the city is currently reviewing the advantages and disadvantages of municipal ownership, it is appropriate to review in greater depth the literature and controversy over the ownership of the water supplies of cities.

In 1800, fifteen of the sixteen public water systems in the United States were privately owned. By 1860 the number of piped water systems increased to 136 and approximately 60 percent were privately owned. In 1872, 72 percent of U.S. cities had a public water supply system and approximately 57 percent were privately owned. By 1920, the percentage of municipal systems had increased to 68 percent.¹⁹ According to M. N. Baker, the increase in ownership after the mid-1800s was due to a number of factors, including a general belief that water should be publicly owned and that municipal finances were improving to the point where ownership was possible.²⁰ Baker argued that both private and public water rates should be based only on the cost of service including operating and capital costs. He concluded the major disadvantage of public ownership was that political issues rather than economics would result in the system not being self-supporting.²¹ Baker concluded that the primary advantages of private ownership were its efficiency and cheap labor. Edward Bemis argued that municipal ownership was preferable to private ownership because of the potential for corruption and bribes from corporations seeking city franchises.²² In addition, municipalities paid higher wages and required shorter working hours and therefore municipal ownership was a benefit to the working class. Bemis further argued that cities should be able to provide water at the same cost as private enterprise because the city did not have to maintain lobbyists or pay for expensive legal fights with city government. In addition, the acquisition of capital was cheaper for city government than for private corporations.²³ By the beginning of the twentieth century, municipal ownership was an accepted practice and Robert P. Porter, director of the Eleventh U.S. Census, concluded: “water is as much public property as the rainfall,” and water systems should be owned by the public.²⁴

The scholarly debate over ownership of water systems was

relatively quiet until the 1950s. In *Public Utilities in American Capitalism*, Martin Glaeser reviewed the literature on the trend of public ownership of water utilities and concluded the literature was scarce and incomplete. Relying on both secondary and primary sources, Glaeser traced the concept of private ownership of utilities back to the "farming out" of the collection of taxes in ancient Rome, and to England in the 1600s when Parliament permitted the collection of tolls for maintenance of trunk roads. He argued that public ownership accelerated in the early to mid-nineteenth century due in part to changes in state legislation which provided the necessary authority to allow municipalities to own utilities. Although Glaeser provided an overview of the trend in municipal ownership of utilities, he did not propose any underlying cause for the trend.²⁵

The debate over the causes of the municipal ownership trend intensified in the 1980s as historians began to study the impacts of urbanization on the environment. Many historians focused on the cause of municipalization in an individual city while others attempted to develop models that would universally explain the trend. In *Triumph and Failure: The American Response to the Urban Water Supply Problem, 1860-1923*, Stuart Galishoff concluded that by the end of the Civil War, American cities were too dense and populated to rely on cisterns and scattered wells for urban water supplies. Galishoff attributed the rise in municipally owned systems to the need for large capital outlays to construct effective treatment systems. The need for treatment systems resulted from contamination of local water sources by urbanization and industrialization. Galishoff also attributed the municipalization trend to the failure of private companies to provide water for adequate fire protection.²⁶ Martin Melosi also argued that fires and epidemics led to a public demand that water supplies be placed under municipal control.²⁷

Janice L. Reiff reviewed the history of municipal utility ownership in the City of Seattle, Washington. Reiff concluded that laws affecting municipal bonding were a factor in municipal ownership. The first city-wide water system in Seattle was installed in 1876 by a group of local businessmen. Although the city experienced poor service and high water rates, it was unable to purchase or install a new system due to the limitations of the city charter. In 1886, a charter amendment was passed which allowed the city to finance a waterworks system.²⁸

Harold Platt traced the growth of public utilities in Houston from 1830 to 1910 and focused on the interaction between the inhabitants and the urban areas they created. Platt argued that without the development of municipal water supply systems, dense urban areas could not have existed. Initially only the wealthy could afford plumbing and running water in the home.

However, by the 1890s potable water piped to individual homes was considered a necessity or a right of citizens.²⁹ Platt examined the debate over who should provide public services: city government or private businessmen. In Houston, like other early western cities, the ability of municipal governments to provide for public services such as water and sewer systems was dependent on the city's legal ability to impose taxes and the citizens' willingness to pay the taxes. During the 1890s Houston struggled with the dilemma of who should own the water system. Due to conflicting political opinions and the failure of economists to demonstrate the advantages of one type of ownership over the other, the issue remained emotionally charged for many years. Platt argued that the lack of competition for the Houston water monopoly resulted in poor service and inadequate pressure for fire-fighting.³⁰ The question of water purity was also raised in 1895 and Houston's doctors reported the water supplied by the private company was "detrimental to the public health."³¹ Political and legal disputes over the ownership of the water system ended in 1906 when Houston purchased the water system from the private utility company.³²

High water rates were frequently noted as a cause for municipal takeover of private water systems. Several historians approached the question of who could provide the most favorable water rates by reviewing publicly available data such as census records, labor and energy costs, and other economic factors. Susan Feigenbaum and Ronald Teeple outlined a cost approach to look at the question of efficiency of public or private water services and noted that previous studies produced conflicting results.³³ In most states, water rates were not determined by the market but were regulated by public utility commissions. The authors concluded there was no significant difference in cost functions such as labor and energy that would favor one type of ownership over the other. In *"Public versus Private Water Delivery: A Critical Analysis of a Hedonic Cost Approach,"* Robert McGuire and Robert Ohsfeldt reviewed a number of studies that compared the efficiency of public versus private utilities. McGuire and Ohsfeldt concluded that Feigenbaum and Teeple's cost estimates excluded factors such as depreciation and taxes, and therefore failed to accurately measure economic cost.³⁴

William Hausman, David Kemme and John Neufeld conducted a statistical analysis of 375 private water utilities and 659 municipal-owned facilities or approximately one-third of the water utilities in operation in 1899. Although they concluded that municipal utilities were charging a lower rate, the cost of the operation were statistically insignificant. They concluded that the lower rates charged by municipalities frequently resulted in negative profits or rates of return, suggesting the losses were

covered by tax revenues.³⁵ A more recent economic analysis, conducted by researchers at the Reason Public Policy Institute in Los Angeles, California, compared the operation of three investor-owned water utilities with six public water agencies. They concluded that private water utilities could supply water for the same rates as municipal systems, and at the same time pay local, state and federal taxes.³⁶

Werner Troesken and Rick Geddes also took a statistical approach to interpreting the municipalization trend of the Progressive Era. Data sets included information on water systems during the period 1897 to 1915. Among other findings, they found the proportion of municipally owned water systems increased from 43 percent in 1890 to 68 percent in 1920. They reviewed various financial theories to account for the increase in municipal ownership, including market failure caused by capital market limitations and legal liabilities for typhoid epidemics. They concluded that typhoid liabilities existed regardless of ownership, and market failure would have been difficult since most private water companies were actually monopolies. Based on a number of financial variables, Troesken and Geddes concluded that the threat of municipalization produced negative impacts. Private water systems, fearing municipal takeover, made no new investments and reduced expenditures which resulted in the delivery of inadequate services as towns continued to grow and expand.³⁷

In a separate study, Troesken also reviewed national typhoid rates, waterborne disease outbreaks in North Carolina, and private investment patterns. He concluded that waterborne disease rates in minority communities were lower in cities with publicly owned water utilities. In addition, he noted whites had lower disease rates than African Americans, regardless of which entity owned the water system, but he was unsure if this was related to race or economic status. Troesken also reviewed the claim by social reformers that typhoid was more common in cities with privately-owned water systems than in cities where the water system was publicly owned.³⁸ Using typhoid rates between 1880 and 1920, he concluded that switching from private to public ownership did not result in a decrease in typhoid.³⁹ Troesken noted that the failure by the private water company to extend lines to minority neighborhoods in New Orleans was one of the reasons the City of New Orleans took over the water supply system in 1908.⁴⁰ David Culter and Grant Miller disagreed with historians who argued that the provision of polluted water and high incidents of disease caused the municipalization of private water supply.⁴¹ Instead, they concluded that the cost of capital and the development of new funding vehicles, such as municipal bonds, explained the trends in municipal ownership.

In *Hard Water, Politics and Water Supply in Milwaukee, 1870-1995*, Kate Foss-Mollan traced the development of several early water supply systems including Boston, New York, and Baltimore. In each case, the cities initially turned to the private sector to provide a water supply. Foss-Mollan concluded that by the mid-1800s, the cities had changed to publicly owned systems due mostly to inadequate service and poor quality water.⁴²

Michael Rawson traced the history of Boston's water supply and the battle over ownership of the system. Boston's urban reformers favored a publicly owned system on the grounds that an abundant supply of pure water was a necessary vehicle for public health. The wealthy Boston elite were opposed to a public system, arguing that water was a commodity, available to those who could afford to pay for the service. They also opposed the increased taxes necessary to pay for the municipal system.⁴³ The reformers sought to change the issue from an economic to a moral argument, claiming that "water is as essential to life and health as bread and air."⁴⁴ In 1848, Boston's citizens ultimately agreed that "water was essential to the health and happiness of its people" and constructed a publicly owned system.⁴⁵

Urban historian Maureen Ogle concluded that the sanitary reform movement that began in the mid-1800s explained the municipalization trend in American water system ownership.⁴⁶ In the mid-nineteenth century, urban services such as water and other utilities were controlled by the urban elite and followed the principle that property owners who paid taxes should control the services they wanted, in proportion to the value of their property. Ogle noted the mid-nineteenth century was the era of the private city where the city might finance cisterns or wells for fire protection, but providing city-wide services was a risky business, best suited to the private sector. Ogle argued that building a municipally financed water supply system required the citizens to accept a more powerful form of city government than taxpayers were willing to concede.⁴⁷

Using Boston and Oakland as examples, Sarah S. Elkind attributed the private ownership of water systems in many western cities to the fact the west was settled during the era of Manifest Destiny. Elkind argued that eastern cities, often with a tradition of public activism, were more likely to have publicly owned water systems.⁴⁸

A survey of the literature concerning municipalization of water supply systems suggests that the causes are numerous and frequently site-specific. The longevity of Boise's privately owned water system, despite the occurrence of causes advanced by historians, suggest stronger factors have precluded municipal ownership.

Boise's Municipal Ownership Debate

Prior to the construction of the first piped city-wide water supply system in Boise, water was obtained from a number of sources. There were several wells which could be used by the local citizens to obtain water. As early as 1875, there was a discussion in the city concerning construction of a piped public supply using an artesian well as a source of water. In 1879 a water supply for the city was again discussed, and the newspaper advocated using a spring in Hull's Gulch to supply water to the city. The spring was reported to flow 100 gallons per minute (gpm) and could be used to fill a reservoir and distribute the water through galvanized pipes. The cost was estimated to be less than \$10,000.⁴⁹ This system was never installed. In 1886, Boiseans again considered installing a publicly owned water supply. At that time, the estimated cost of a system was between \$25,000 and \$50,000. Options included diverting water from the Boise River upstream of the city, a ditch from Cottonwood Creek, or artesian wells. However, Cottonwood Creek would not supply water year-round, and artesian wells were not proven in the area, although they were considered the cheapest solution. In 1890, a privately owned water system was installed and temporarily halted the debate over a municipally owned water supply. Subsequently, in 1892, two years after the initial piped water system was installed, the *Idaho Daily Statesman* advocated public ownership even if it required an increase in taxes. The *Statesman* editorialized that "Taxes to obtain a water system which the city will own when completed is one thing, and being bled through the coming years by soulless corporations that may and will fix their own prices is quite another."⁵⁰

In 1892, during a dispute with the Perrault Ditch Company over the cost of water for sewer flushing, A. J. Wiley and A. D. Foote proposed construction of a city-owned canal. The 18-mile canal was estimated to cost \$80,000 and take three months to construct. Twelve miles of the canal would be an open ditch and 6 miles a wooden flume. The canal would originate at Mores Creek and was designed to carry 2,000 inches of water.⁵¹ A hot spring near the mouth of Mores Creek could be diverted into the canal during the winter to prevent freezing.⁵² Joseph Perrault, owner of the Walling Ditch, questioned if any of the water would reach the city due to seepage and evaporation.⁵³ In a presentation to the City Council, Foote proposed maintaining a reservoir of 2 million gallons of water for fire protection. Foote proposed a water rate of \$5 per year for each city lot, \$10 per year per acre of garden and \$5 per year per acre of agricultural land.⁵⁴ Despite the extensive discussions, the city took no action on the engineers' proposal.

In 1899, the Populist Party in Boise recommended a slate

of candidates who favored municipal ownership of the water and electric companies and charged that the Republicans wanted to place government in the hands of private corporations.⁵⁵ In 1900, during a dispute with the water company over rates charged for water for fire protection, the City Council considered the construction of a new municipal system. City Councilman Phelps wrote to several cities to inquire about the cost of such a system. In December 1900, Phelps presented a report to the City Council containing the results of a survey of fifty cities queried on municipal ownership. Of the thirty responses to Phelps' letter, twenty-four were in favor of municipal ownership of water supply systems. The responding cities considered municipal ownership a boon, not a burden. The rate charged by the cities ranged from one-third to two-thirds of the cost of water in Boise. For instance the annual cost of water for a four-room house with one bathtub and one water closet was \$7 in Plymouth, Ohio; \$11 in Burlington, Ohio; \$12 in Boulder, Colorado; \$16 in Moorehead, Minnesota; and \$18 in Spokane, Washington. At that time the Artesian Hot and Cold Water Company was charging \$24 per year in Boise for similar-sized houses.⁵⁶ Although the rate charged to the residents of Boise was higher than the surveyed cities, it was significantly lower than the \$39.60 annual rate charged in Oakland, California.⁵⁷

In May 1901, during the ongoing debate over municipal ownership, H. B. Eastman, the major stockholder in the water company, stated that neither he nor the other directors of the company were opposed to municipal ownership of the water system. He noted that neither the Mayor nor City Council had inquired about the purchase price of the company. Eastman further stated the company would sell the water system to the city at a cheaper price than they would sell it to another private company.⁵⁸

In 1901, the city estimated a new gravity water system would cost \$400,000 and a pumping system \$200,000. State law would only allow the city to issue bonds for 15 percent of the assessed valuation of taxable property in the city, which at the time was approximately \$3,000,000. Given the existing bonding of \$225,000, the city only had \$225,000 for new bonding capacity, a sum insufficient for a construction of the preferred gravity system. The city's assessed valuation was made using only 60 percent of market value and the city could have raised the valuation to meet new bonding needs.

In 1904, the city again contemplated purchasing the water system and retained Samuel M. Gray, a consulting engineer, to review the water system and determine a fair value. At that time, the water system consisted of eight artesian wells in Hull's Gulch and two shallow wells near the Natatorium. Water was stored in

two reservoirs in Hull's Gulch and a third reservoir near the Penitentiary. During peak demand in August, the system supplied approximately 3 million gallons of water per day. Ten percent of the supply was from artesian wells and 90 percent was from the shallow infiltration wells near the Natatorium. There were approximately 31 miles of pipeline in the city. Gray estimated the value of the water supply system to be \$208,000.⁵⁹ A special city committee on water supply recommended issuing \$600,000 in bonds to purchase both the water company and the Perrault Ditch.⁶⁰ In January 1905, the City Council voted to submit the bond issue to the taxpayers. On February 11, 1905, the bonds were defeated by a vote of 862 to 131.⁶¹

The question of city ownership was also revisited in the 1920s and 1930s. The water company prepared a white paper on the evils of municipal ownership and argued that municipal ownership was political ownership and placed the city in competition with private industry. It further claimed that municipal ownership was inefficient, fostered corruption and was "directly opposed to the nature and ideals of American citizenship."⁶² Again in 1968, the city revisited the issue and formed the Boise Water Resource Committee to investigate potential municipal ownership of the water system, retaining the engineering firm of Cornell, Howland, Hayes and Merryfield to evaluate the water system requirements for the Boise Metropolitan Area. Although the city attorney advised the committee they could acquire the water system through eminent domain, the water company suggested it would take more than \$15 million to "put Boise Water Corporation out of business."⁶³ On the issue of public-versus-private ownership, the engineering company retained by the city concluded: "The type of ownership should be chosen that will give the best service for the least cost."⁶⁴ The following year, the city retained the engineering firm of Stevens, Thompson & Runyan to prepare a valuation report on the water systems owned by Boise Water Corporation and Capitol Securities Water Corporation. The consultants placed a value on the combined systems of between \$5.8 and \$9.7 million. The consultant also recommended that "the city should proceed to purchase the major water systems in the Boise metropolitan area."⁶⁵ However, the city took no action on this recommendation. In 1977, the history of the water system was again reviewed, this time by the Boise Center for Urban Research. The authors of the report concluded that the system did not have excessive problems and that "water delivery was efficiently and effectively carried out."⁶⁶

During the last 115 years, the water system has changed ownership several times but has remained privately owned. United Water Idaho, Inc., whose parent company is United Water Resources, is owned by Suez Lyonnaise des Eaux, a French

company with international water operations. The company has expanded its service area by acquiring other privately owned water companies and by extending its service lines outside the City of Boise.

From an engineering and economic viewpoint, the answer to the question of municipal versus private ownership of a water supply remains the same today as in 1968: whoever can provide the best service for the lowest price. The answer, however, is more complicated than this simple statement since there may be more to the ownership question than just cost.

Boise's Anti-Tax Attitude

The absence of historical or current ownership of many city services, including solid waste collection and disposal, electrical generation, city transportation, street and bridge construction, and water supply is due in part to the reluctance of Boiseans to use tax payers' money for these services. This reluctance of the citizens of Boise to pay taxes can be traced to the origin of the city. At that time, the citizens of Boise were not in favor of municipal government and believed that incorporation was just an excuse for collecting property taxes. Robert Blank attributed the libertarian anti-tax attitude of Idahoans to the rugged individualism common to those who inhabited Idaho during the Territorial Period. The relatively low rate of migration into the state and lack of outside influence resulted in the continuation of this libertarian attitude to the present day.⁶⁷

During the 1899 Idaho Constitutional Convention, most delegates were opposed to taxes and public indebtedness. Article VIII, Section 3 of the Constitution prohibited local governments from incurring indebtedness or liabilities in excess of the expected yearly revenues unless the liability was approved by two-thirds of the voters at a special election. Peter Pefley, who was the mayor of Boise from 1887 to 1889, was one of only a few delegates who opposed the requirement for a two-thirds majority at a special election. He noted that Boise frequently needed funds to prevent ditches and streams from flooding the city and did not have time to call a special election. In 1972, the Idaho Legislature amended the Constitution and lowered the vote requirements for passage of revenue bonds for water or sewer projects from two-thirds to a simple majority.⁶⁸

During the national trend in municipal ownership, Boise property owners, who paid most of the taxes, were not inclined to pay for services for those who could not afford the cost. Municipal ownership of services such as the water utility would have resulted in taxes on wealthy property owners resulting in disproportionate benefits to others with less valuable property. For instance, a property valued at \$10,000 would pay more

taxes than a \$5,000 property, but both would receive the same service.⁶⁹ The Boise Board of Trade, a local booster organization noted that Boise's "debt is kept within safe and reasonable limits and taxation is not burdensome."⁷⁰ In 1898, when the Boise City Council considered new taxes to pay off a floating \$51,540 debt, a *Capital* editorial stated "People are not ready for an increased tax. City taxes are quite high now and press the limit close. It is not desirable to drive investment away from Boise."⁷¹ Frank Coffin, a local businessman and stockholder in the Water Company, was quoted as saying "It is proper that those who come after us should help pay for the permanent improvements."⁷² In November 1899, several citizens including H. B. Eastman and Alfred Eoff (two water company officials) protested to the City Council that property assessments were too high.⁷³ Boiseans believed that government officials were too extravagant with public expenditures and if they could not stay within a reasonable budget, someone should "go in with a broad axe and simply hew expenses down."⁷⁴ In December 1899 the City Council was seeking ways to reduce expenses, including reducing the number of police and cutting down on the number of electric street lights.⁷⁵

In 1921, taxes and the issue of water system ownership were still of concern in Boise, and the Taxpayers Committee supported Eugene B. Sherman for Mayor on a platform that included healthful city water and less taxes.⁷⁶ From 1914 to 1927 school district and property taxes in Boise increased by 200 percent.⁷⁷ In 1928, when the public water supply system was sold to an out-of-state company, Boiseans were, as usual, concerned with taxes. Mayor Walter Hansen reported that the city could function with the same tax levy as last year and only spend money on essentials.⁷⁸ In 1928, a taxpayers' league was formed for all "Who believe that taxes have more than reached their limit."⁷⁹ The Water Company, being a private corporation, also paid taxes. In 1938, the company claimed that despite a tax increase of \$6,800, they managed to reduce residential water rates.⁸⁰

Boise businessmen and residents have continued to oppose taxes. In 1984, the Idaho Innkeepers Association opposed a new Boise convention center based on the fact that the taxes to pay for the building were not spread equally over the city property owners, but fell disproportionately on the hotels.⁸¹ In 1990, a state representative urged homeowners to fight a proposal to reduce the homeowner exemption because it would increase taxes on individual homes.⁸² In 1990, a poll taken by *The Idaho Statesman* showed that readers were opposed to paying higher property taxes for municipal purposes. One citizen stated that "we in the middle class cannot continue to support all these bond issues and tax increases."⁸³ In 2005, a panel of fourteen Idaho

lawmakers held a public hearing to listen to concerns about property taxes. One citizen said "If this keeps up, you will tax people out of their homes they live in."⁸⁴ In 2006, Boise taxpayers continued the anti-tax trend and defeated a bond proposal for new library buildings.

Recent Trends in Municipal Ownership of Water Systems

Internationally, the lending practice of the World Bank has driven the privatization of public water systems. Although the practice is not without controversy, privatization has improved the delivery and availability of water in many developing nations. In some countries, a backlash against privatization has occurred because of the increase in water rates necessary to upgrade outdated water systems. Investor-owned water systems are common in Europe where more than 75 percent of the population is served by the private sector; in contrast, only about 15 percent of the public water supply systems in the United States are privately owned.⁸⁵

In contrast to the European experience, a number of municipal governments in the United States are attempting to gain control of private water supply systems. The movement was triggered in part by the acquisition of small regional water systems by multinational corporations. The new municipal ownership trend is supported by many anti-globalization and environmental activists. Although environmental and grass-root organizations frequently list high water rates as one reason for municipal takeovers, the Congressional Budget Office estimates that only 0.5 percent of the average household budget is spent on water and wastewater fees.⁸⁶ Most often the issue is over local-versus-foreign control and the ownership issue only became controversial when the local water company considered selling the water system to a multinational company. Table 1 contains a list of recent municipal takeover attempts of private water companies.

Table 1.
*Recent Water System
Municipal Takeover Efforts*⁸⁷

MUNICIPALITY	WATER COMPANY
Lexington, Kentucky	Kentucky-American Water Company
Indianapolis, Indiana	Indianapolis Water Company
Washington Court House, Ohio	Ohio Water Service Company
Duval, Nassau and St. Johns Counties, Florida	United Water Resources
Huber Heights, Ohio	Ohio Suburban Water
Pekin, Illinois	Illinois-American Water Company
Peoria, Illinois	Illinois-American Water Company
Chattanooga, Tennessee	Tennessee-American Water Company
Champaign, Illinois	Illinois-American Water Company
Charleston, Kentucky	West Virginia American Water Company

SOURCES OF DOMESTIC WATER SUPPLY

Figure 2.
Well House and Drilling
Derrick in Hull's Gulch
(Circa 1920)⁸⁸

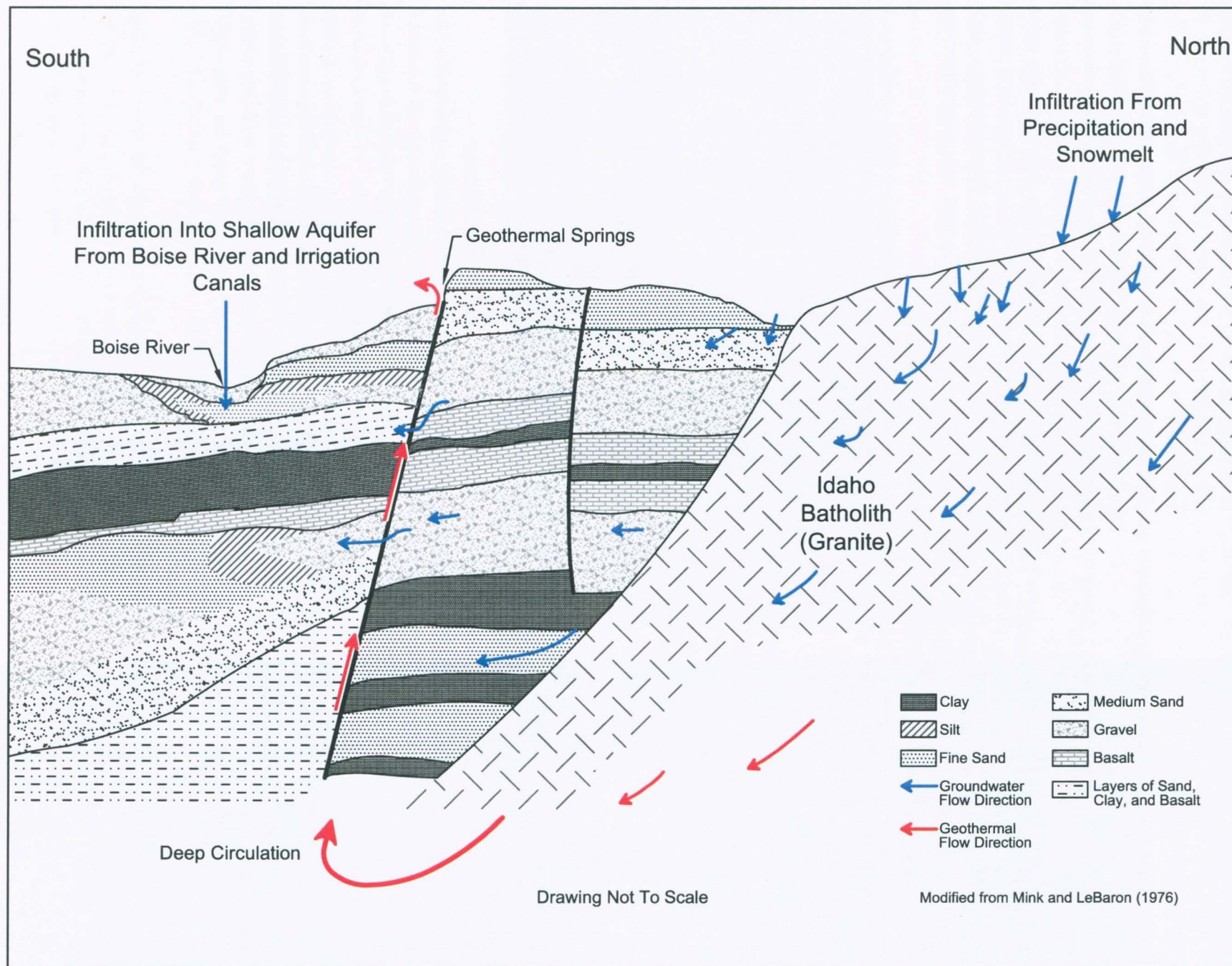


Groundwater & Surface Water Resources

The geology and climate of the Boise Valley significantly impact the occurrence and reliability of groundwater as a source of water for the City of Boise. The yearly mean rainfall is approximately 11.9 inches. Infiltration from this limited amount of local precipitation is not sufficient for a longterm dependable supply of groundwater for the growing metropolitan area.⁸⁹ Groundwater in the Boise area occurs primarily in sand, gravel and basalt layers that extend to a depth of approximately 6,000 feet below the valley floor. However, groundwater used for municipal and irrigation purposes generally occurs above a depth of 1,200 feet.⁹⁰

Although a number of geologic strata can be recognized in the subsurface, the groundwater-bearing sediments are generally divided into a shallow aquifer (less than 500 feet deep) and a deep aquifer (greater than 500 feet deep). The shallow aquifer

Figure 3
Conceptual Groundwater Flow Diagram



consists primarily of recent alluvial deposits associated with the Boise River. The deeper aquifer consists of interbedded sedimentary and basalt layers. Underlying the fresh water aquifers are older basalt and granite rocks. The freshwater sands, gravels and basalts are in fault contact with the Idaho Batholith that forms the core of the Boise Mountains. Figure 3 is a conceptual diagram of the hydrogeology of the Boise area showing general groundwater flow paths and the layered structure of the Boise valley.

Leakage from the Boise River and numerous canals and laterals plays a significant role in recharge, especially to the shallow aquifer. In the upper (eastern) part of the basin, the shallow aquifer has a higher head than the deeper artesian aquifers, and leakage from the shallow aquifer provided some recharge to the deeper aquifers.⁹¹ However, geochemical studies suggest that recent seepage from the Boise River is not the primary source of recharge to the deeper aquifer. Groundwater from the deeper aquifers provides the bulk of the domestic water supplied in the valley, including 100 percent of the water supply for smaller cities such as Kuna, Nampa, Meridian, and Caldwell. In the Boise area, groundwater withdrawals are approaching the firm yield of the aquifer, and it is likely that water for future municipal growth will be from surface water sources. Boise's geothermal groundwater resource is the result of deep circulation of groundwater which originated as snow melt in the Boise Mountains.

Three major dams have been constructed on the Boise River: Arrowrock Dam (1915), Anderson Ranch (1950) and Lucky Peak (1955). The three dams can store approximately 1 million acre-feet of water.⁹² Without the dam system, farmers in the Boise valley would suffer frequent curtailments, such as occurred in 1905, and the residents of the "City of Trees" would not be able to enjoy lush vegetation and green lawns.

Generally there is sufficient water in the Boise valley to supply the current and projected uses for domestic, industrial, commercial, power, and irrigation purposes, although the water may not be where it is needed when it is needed. Sufficient water for municipal or domestic purposes is assured in the valley because the Idaho Constitution places the highest priority on municipal use: "when the water of any natural stream is not sufficient for the service of all those desiring the use of the same, those using the water for domestic purposes shall (subject to such limitations as may be prescribed by law) have the preference over those claiming for any other purpose."⁹³ As the municipal population of Ada and Canyon counties and associated domestic water demands increase, a gradual transfer of water use from irrigation to domestic will likely occur.

Canals and Landscape Irrigation

In addition to domestic and fire protection needs, Boise uses a significant amount of water for landscape irrigation. Boise is well known for its green landscape and is frequently referred to as the City of Trees. French speaking trappers in Peter Ogden's fur trapping party referred to the Boise River as the Boissie or Wooded River as early as 1824.⁹⁴ While this description was apt for the cottonwoods growing along the river, it hardly fit the sagebrush plain between the river and the foothills that became the future site of the City of Boise. In 1869, the editor of *The Idaho Daily Statesman* noted that due to the canals under construction, the city would soon "blossom with gardens and trees and shrubbery" and "look more like home and a place to live than present unsightly yards and lots of sagebrush and sand."⁹⁵

Although canals did not play a significant role in the domestic water supply for the city, privately owned canals provided water for irrigated agriculture, lawn irrigation, fire protection, street sprinkling, and sewer flushing. Numerous waterwheels were located along the canals and were used to transfer water to flumes and irrigation ditches (see Figure 4). The wheels made considerable noise, which was described as a "screeching tenor."⁹⁶

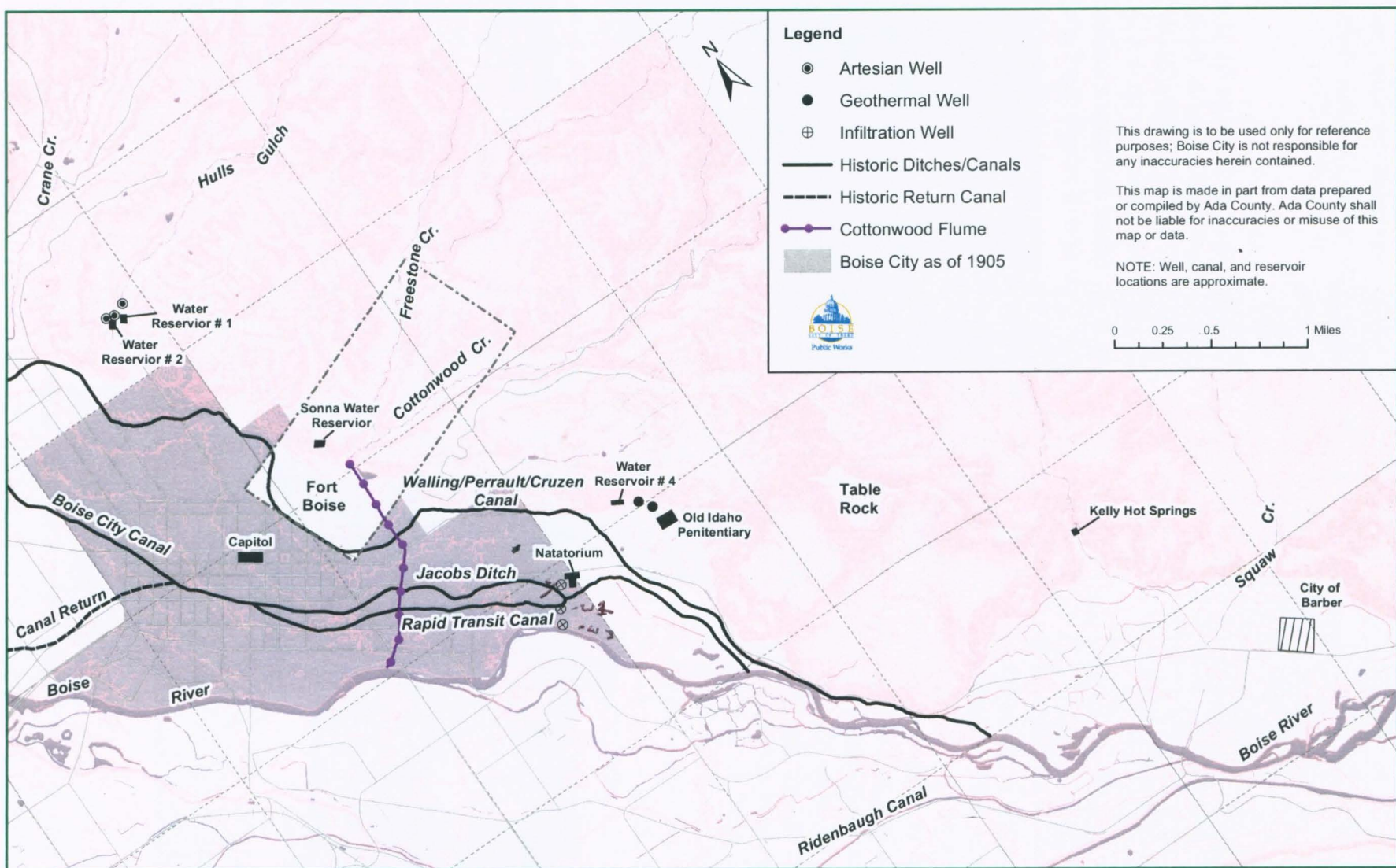
Figure 4.
*Waterwheel Used to Irrigate
Crops in the Boise Valley*⁹⁷



Tom Davis Canal

In 1863, Tom Davis constructed the first canal in Boise to irrigate 300 acres of land on the north side of the Boise River. He enlarged the canal in 1864 and again in 1865. The headgate for the canal was located approximately two miles east of the original Boise township site. The canal split into two branches behind the Natatorium, and was re-united near the intersection of Grove Street and Capitol Boulevard. The northern branch was known as the Jacobs Ditch and the southern branch as the Ellis Ditch or Rapid Transit Canal. The location and names of various canals are shown in Figure 5. The northern branch was the main

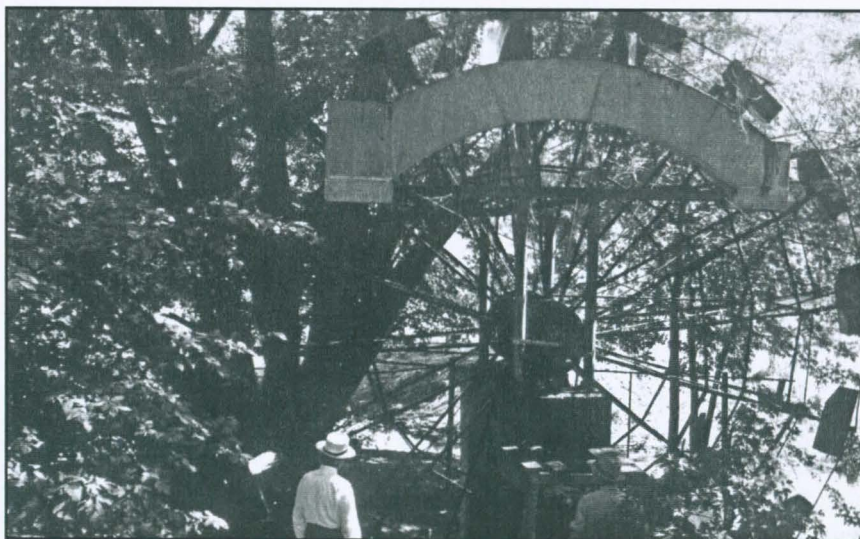
• Figure 5. Location of Canals and Wells



canal and is still used by the Boise City Canal Company. The remains of the southern canal are still visible behind the Natatorium Swimming Pool between the Boise City Canal and the Greenbelt. West of where the canal branches were re-united, the canal was known as the Grove Street Ditch, Grove Street Canal or the Boise City Canal.

The Boise City Canal Company, which was incorporated on January 12, 1866, continues to provide water for landscape irrigation to many residences and businesses in Boise.⁹⁸ Waterwheels were common on the canal. The waterwheel shown in Figure 6 was originally located behind the Natatorium. The waterwheel was removed, refurbished and is now located in the C. W. Moore Park at the intersection of Fourth and Grove streets.

*Figure 6.
Waterwheel on the old Davis
Canal behind the Natatorium⁹⁹*



Vallisco Water Company Canal

In 1864, the Vallisco Water Company applied to the Idaho Territorial Legislature for a charter to supply water to the Boise valley. The company opened subscriptions for stock in February 1865. Work on the ditches started in May 1865 and was completed in 1866. The headgate for the canal was located approximately three miles east of the original city limits or about one mile upstream of the intake for the Davis Canal. The ditch was designed to carry 5,000 inches of water and furnished water for agriculture, mining, mechanical and city purposes.¹⁰⁰ The canal crossed under Warm Springs Avenue near the intersection of Warm Springs Avenue and Penitentiary Road (see Figure 7) and followed the topography along the foothills on the north side of town, crossed the Cottonwood Creek Flume and ran along Fort Street in front of Fort Boise. The guardrails of two bridges which crossed the canal are still present north of Fort Street (see Figure 8).

*Figure 7.
Remnants of Perrault Ditch
at Warm Springs Avenue
(photo by author, 2006)*



Various historical documents and newspaper articles referred to the Vallisco Canal as the Walling Ditch, the Perrault Ditch, or the Cruzen Ditch. At the beginning of each irrigation season, the canal company advised potential customers to “clean out their ditches” and apply for water.¹⁰¹ In 1916, A. R. Cruzen paid \$15,000 for the water rights, canal, lateral branches and distributing ditches.¹⁰² Cruzen continued to provide water for irrigation, street sprinkling and fire protection. Residences along the canal installed metal pipes into the canal. Canvas hoses were connected to the pipes and the water was used for flood irrigation of lawns and vegetable gardens.¹⁰³ The city discontinued using the water for fire protection because the water was frequently turbid, contained debris and was not always available during the winter. The ditch was finally abandoned in 1950.

*Figure 8.
Guardrails of Bridge Over
Walling/Perrault Canal near
Old Fort Boise
(Photo by author, 2006)*



Creeks and Flooding

Although the intermittent streams or creeks that drained the foothills north of Boise were not considered adequate for a permanent water supply, they caused periodic flooding and prop-

erty damage in the city. A significant portion of the city budget was expended on controlling flow from these creeks. The city constructed wooden flumes and dams to divert the water away from the downtown area, frequently resulting in lawsuits when the flumes failed.

In December 1881, the contractor hired by the city to keep Cottonwood Creek in its channel made repairs at the mouth of the canyon that resulted in an overflow of water into the horse corrals at Fort Boise. The soldiers diverted the channel but the contractor changed it back, creating a controversy between the city and the fort.¹⁰⁴ To prevent future flooding, the fort constructed a stone wall and channel to divert Cottonwood Creek along the southeast boundary of the fort (See Figure 9). The remaining part of the diversion ditch consisted of a wooden flume. Costs to maintain the flume were high and in 1892, the city paid \$1.97 per foot for a stone aqueduct to carry the runoff to the river.¹⁰⁵ In 1893, city expenditures for the Cottonwood Flume were \$5,055.92.¹⁰⁶

*Figure 9.
Cottonwood Creek
Diversion near Fort Boise
(Photo by author, 2006)*



In 1894, the Cottonwood Creek Flume broke and flooded the southern part of the city.¹⁰⁷ Again in 1901, a flood almost destroyed the Cottonwood Flume and it overflowed at two separate points. The expense of repairing the flume was \$263.75.¹⁰⁸ For several decades, Cottonwood Creek overflowed and flooded the city, frequently destroying the flume built to divert the flow to the east of the city. In 1902, the city agreed to pay George Brown \$599 per year to keep the sand out of the Cottonwood Flume.¹⁰⁹ Brown constructed a series of brick and rock dams to collect the sand before it could enter the flume. In less than two years, Cottonwood Gulch was filled with eight to sixteen feet of sand. A small park and lake were constructed on top of the fill.¹¹⁰

Flooding in Cottonwood Creek has periodically continued to cause damage and inconvenience to the city (See Figure 10). A flood in January 1965 breached the dam of the holding lagoons on Cottonwood Creek and flooded a significant area of East Boise.

*Figure 10.
Flood Waters near
Avenue B and Idaho Street¹¹¹*



Flooding in Hull's Gulch was also a nuisance to people living on the north side of town. In an 1894 dispute between property owners, a landowner constructed a levee to keep the water off his property that resulted in water flowing down Thirteenth Street. The City cut the levee and posted armed guards to prevent the levee from being reconstructed. In 1913, a flood in Hull's Gulch washed out the Water Company's No. 3 water storage reservoir.

Although the creeks and intermittent streams that drain the foothills played only a small role in the water supply for the City of Boise, infiltration of precipitation and snow melt in the creek bottoms resulted in recharge to the shallow and deeper aquifers which provided the majority of the domestic water in Boise.

GROWTH OF THE WATER SYSTEM

Boise promoters, including the editors of the local newspapers, were well aware that an adequate supply of water was necessary for the town to grow. In 1875, *The Idaho Statesman's* editor recommended that the city use artesian wells in the foothills as a source of public water.¹¹² In 1879, under the headline "Pure Water for the City," the editor again advocated the construction of a piped public water supply, estimating that it would cost less than \$10,000 to install a system using springs in Hull's Gulch to supply water to the city. The city, however, took no action on his suggestion.¹¹³ In 1887, Frank Davis proposed drilling artesian wells in Cottonwood Gulch and another in Crane Gulch if the city or subscribers would fund the venture.¹¹⁴ At the time, the general public did not generally accept that flowing artesian wells could be drilled in Boise. Although a piped water supply system was a frequent topic of discussion in Boise, the city took no action to provide a piped supply. The public water wells in city streets were funded through subscriptions or donations as was typical of the times for mining cities in Idaho.

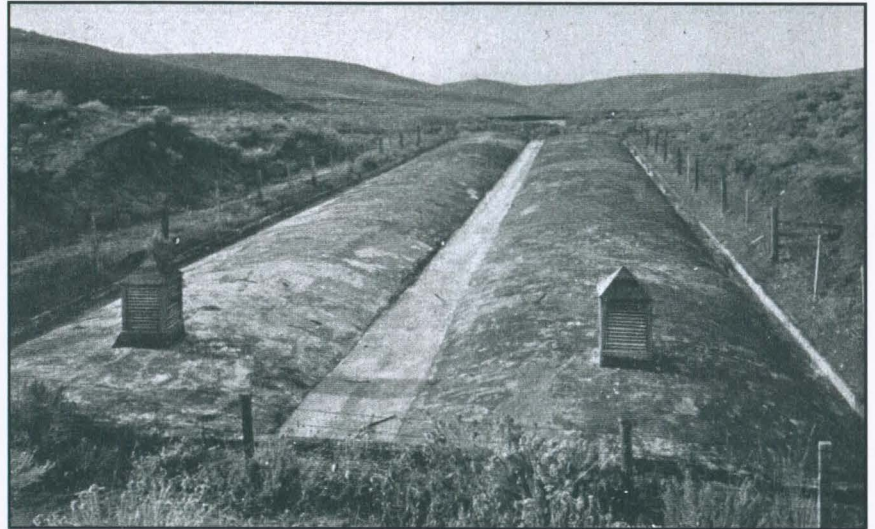
Boise's First Piped Water System

In 1881, the first piped water system in Boise was installed by H. B. and B. M. Eastman at the Overland Hotel, located at the northwest corner of Eighth and Main streets. The Eastman brothers obtained water from a spring in Hull's Gulch, stored it in a brick reservoir, and then piped the water down Eighth Street to the hotel. The Overland Hotel advertised in *The Idaho Daily Statesman* that the hotel was "Well Supplied with Mountain Spring Water."¹¹⁵ The Eastman brothers also supplied water to a city cistern used to store water for fighting fires, to Mr. C. W. Moore's mansion located on Grove Street, and to several other residences and businesses along the pipeline route. When the Territorial Capitol Building was completed in 1886, the Eastman brothers also provided water for its boilers.¹¹⁶

In 1889, the Eastman brothers proposed to supply water to the City of Boise for domestic and firefighting purposes. On October 3, 1889, the city passed Ordinance No. 94 granting the Eastman brothers the right to lay water pipes in city streets and supply domestic water to the city. The franchise was not exclusive and on June 2, 1890, The Artesian Water and Land Improvement Company was formed to compete with Eastman's company. On July 10, 1890, the City Council passed Ordinance No. 100 giving permission to the second water company to install water pipes in city streets. The Eastman brothers, requiring additional capital to compete with the new company, took on new investors and on June 23, 1890, incorporated as the Boise Water Works.

By January 1891, the Artesian Water and Land Improvement Company had nine flowing artesian wells and nine miles of water mains. They had installed two fire hydrants, and a 125,000-gallon water storage reservoir was under construction. The Boise Water Works had two flowing wells, a 550,000-gallon storage tank (see Figure 11), and five fire hydrants.¹¹⁷

*Figure 11.
Reservoir No. 1,
Hull's Gulch¹¹⁸*



In 1891, Boise Water Works completed two hot water wells near the Penitentiary. The addition of the hot water wells gave the Boise Water Works an advantage over the competing water company and on March 27, 1891, Boise Water Works and the Artesian Water and Land Improvement Company consolidated into a new company, the Artesian Hot and Cold Water Company Limited. There were fifty stockholders in the new company, including many of the leading citizens of Boise. H. B. Eastman was the largest stockholder, owning approximately 32 percent of the stock.¹¹⁹ The officers for the company were: president, C. W. Moore; secretary, Charles A. Clark; and treasurer, Alfred Eoff. Two weeks after the corporation was formed, Clark resigned and was replaced by E. B. Tage. The executive committee of the new company was comprised of: H.B. Eastman (Chairman), T. Regan, W. H. Ridenbaugh, Nathan Falk, and Thomas Davis.

In 1892, after the merger of the two water companies, the water supply for the city consisted of six artesian wells, two storage reservoirs located near the original Eastman springs in Hull's Gulch, and sixteen miles of pipe ranging in diameter from three inches to ten inches. The system was sufficient to supply the city's population of 5,500 people.

As the population of Boise grew, the artesian wells were insufficient to supply the growing population and, in 1895, the water company dug two shallow, high-yield wells in the Boise River flood plain near the Natatorium. By 1903, Boise's population had increased to approximately 11,500. To supply sufficient

water to this larger population, the water company drilled seven additional artesian wells and constructed a new 230,000-gallon water storage reservoir in Hull's Gulch (see Figure 12).¹²⁰

In 1900, during a dispute with the City of Boise over charges for water for fire protection, the company disincorporated in Idaho and reincorporated in the State of West Virginia as the Boise Artesian Hot and Cold Water Company. In 1915, after the dispute was settled, the Boise Artesian Hot and Cold Water Company reincorporated in Idaho with no change in name or stockholders.

In 1927, controlling interest in the water company was sold to Paul C. Dodge and Company of Chicago and ownership of the water company passed out of local hands.¹²¹ In 1928, the company was reorganized as the Boise Water Corporation and in 1946 became affiliated with the General Waterworks Corporation. In 1994, General Waterworks Corporation merged with United Water Resources. In 1994, Suez Lyonnaise des Eaux, a French water company, acquired 30 percent of United Water Resources stock, and in 2000 all of the outstanding stock of United Water was acquired by Suez. A chronology of the history of the water supply for the City of Boise is contained in Appendix A.

Figure 12.
Water Reservoir No. 2,
Hull's Gulch¹²²



The infiltration wells were located on company property near the Natatorium (see Figure 4). The first well was located approximately 1,060 feet northwest of the north bank of the Boise River. The well was approximately twenty-five feet in diameter and lined with stone to a depth of sixteen feet. From sixteen to twenty-eight feet, the diameter of the well was reduced to eighteen feet and lined with brick. A rock tunnel extended from the well 103 feet in a southwest direction. The tunnel was approximately four feet high by four feet wide. At the southwest end of the tunnel a rock infiltration gallery was constructed in a southwest direction for a distance of 222 feet.

Jacob's Ditch crossed the end of the rock gallery and provided recharge to the well. Later, when Well No. 2 was dug, a second gallery was constructed between Well No. 1 and Well No. 2. Well No. 2 was fifteen feet in diameter and approximately twenty feet deep. The gallery was sixteen feet deep, seven hundred feet in length and consisted of twelve inch open-joint sewer tiles. Both the Jacobs Ditch and the Ellis Ditch crossed this gallery.

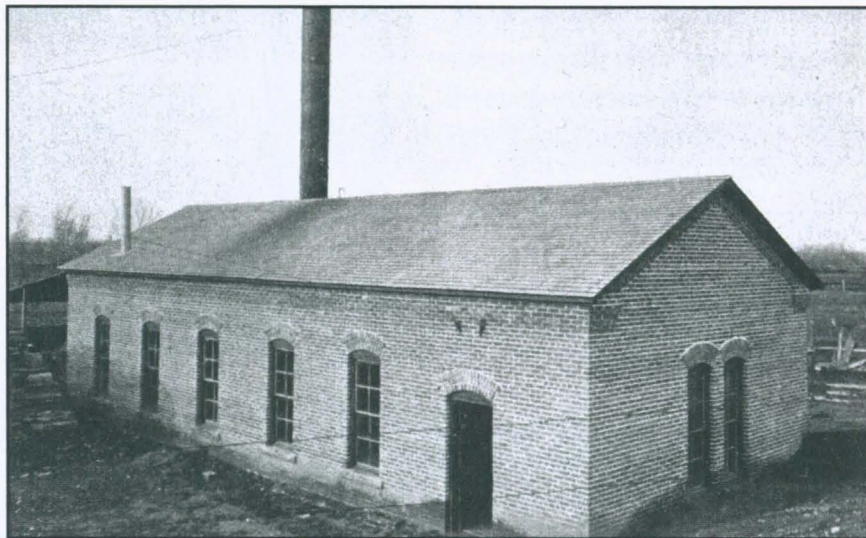
*Figure 13.
Large Diameter Infiltration
Well No. 3¹²³*



In 1906, the company dug a third shallow well approximately fifty feet northwest of the North bank of the Boise River. Well No. 3 was thirty feet in diameter and twenty-five feet deep (See Figure 13). Wood posts were installed around the perimeter of the bottom of the well. The posts were installed vertically and were approximately six inches apart to allow water to enter the well. On top of the posts, a sixteen-inch thick brick wall was constructed that extended to slightly above the ground surface. The floor of the pump house was constructed on the brick wall. The pump house had a wooden floor covering the well with holes for the pump suction pipes. To increase the yield of the well, two infiltration galleries were constructed. The galleries extended approximately 360 feet in a southwest direction to a point under the Boise River. One gallery consisted of two parallel twenty-inch diameter open-joint tiles and was approximately sixteen feet deep. The second gallery was approximately fourteen feet deep and consisted of a 12-inch diameter open joint tile. This gallery terminated a few feet from Well No. 3.

Steam power was initially used to run the pumps in Wells No. 1 and 2 and to pump water to a reservoir near the penitentiary (Figure 14). In 1903, when Well No. 3 was dug, three electrical pumps were installed in the well and the steam plant was retained as backup power.

Figure 14.
*Steam-powered Pumping
Plant near Natatorium*¹²⁴



As Boise grew, the water company expanded the water system by construction of new wells and storage facilities and by acquisition of small water systems. In many cases the water company purchased the smaller utilities at the urging of the city or the Public Utilities Commission.¹²⁵

By 1922, the water system consisted of seven artesian wells, three large-diameter infiltration wells, three storage tanks and ninety-eight miles of pipeline. In 1952, four new infiltration collector wells were constructed near the Boise River. Three were located near the old Natatorium site and another near Veterans Memorial Parkway.¹²⁶ In 1968, Boise Water Corporation had 30 deep wells, four shallow infiltration wells near the Boise River, ten storage tanks, and 131 miles of water mains six-inches in diameter or larger. In that same year, twenty-eight private water supply systems were identified in or adjacent to the City of Boise.¹²⁷ With the exception of the Terra Grande Water System, these systems have been incorporated into the United Water System. However, in 2005, due to contamination of Terra Grande's wells, United Water began to provide water to the Terra Grande service area.¹²⁸

In 1993, to comply with new drinking water treatment standards established by the United States Environmental Protection Agency, the Marden Water Treatment Plant was designed to treat the water obtained from three of the infiltration wells constructed in 1952. The fourth well was not connected to the water system due to the distance from the treatment plant.

*Figure 15.
Infiltration Well Constructed
near the Boise River in 1952
(Photo by author 2005)*



In 2005, United Water constructed a new water intake structure near the Highway 21 bridge over the Boise River and also constructed a new water treatment plant in southeast Boise near Micron's manufacturing facility. In 2006, United Water's system had approximately ninety water wells, twenty-eight storage reservoirs, two surface water treatment plants, and more than 1,000 miles of water mains.

Although United Water Idaho is the major supplier of domestic water in Boise, another private water company supplies water to a small portion of Southwest Boise. Willow Lane Water Company was issued a Certificate of Convenience by the Idaho Public Utilities Commission on November 2, 1955. The name of the company was changed to Capitol Securities Water Company in 1959 and changed again to Capitol Water Company in 1960. After the subdivision was annexed, the city granted the company a franchise. In 2006, Capitol Water Company and United Water Idaho were the only two water companies to hold a franchise with the city of Boise, although a number of other private and commercial wells existed in the city. In addition, many large institutions or industries installed their own water systems. The following sections describe several of the more important water systems that exist or existed in the city.

Fort Boise Water Supply

In July 1863, Major Lugenbeel selected the site for Fort Boise where Cottonwood Creek emerged from the foothills.¹²⁹ The fort constructed a dam on Cottonwood Creek to provide a supply of water.¹³⁰

In 1874, Sonna installed a pipeline from a spring on Five Mile Gulch to a 570,000-gallon water storage reservoir on a hill behind the fort (see Figure 16). Water from this reservoir was used at the fort for fire protection. In 1894, during an inspection of the fort and water system, General Otis in-

structed the fort commander, Major Cooney, to allow Sonna to lay a water main from the reservoir through the fort property so that Sonna could use the water from the reservoir to supply water to the Sonna Building and other customers in Boise.¹³¹

Figure 16.
Sonna Reservoir
above Fort Boise¹³²



In May 1894, Boise issued a franchise to Sonna to lay pipes in the city streets. The franchise was amended in December 1894.¹³³ Although the primary use of the water was to run a passenger elevator in the Sonna building and to provide water for drinking and water closets in the building, Sonna also provided water to several city residences and fire hydrants along the main water line.

In 1877, Peter Sonna filed for and obtained a water right for 500 inches of water in Cottonwood Creek for agricultural, irrigation, domestic and other useful purposes. Sonna used the water to irrigate about 700 acres of land located east and southeast of Fort Boise. In 1899, the War Department sued Sonna, claiming that he appropriated water from springs in Five Mile Gulch, depriving the fort of water necessary for other purposes. However, the court ruled in Sonna's favor.¹³⁴

In 1892, the Artesian Hot and Cold Water Company attempted to obtain permission from Fort Boise to drill a water supply well on the reservation. The company offered discounted water rates and enlisted the help of Senator George L. Shoup, a stockholder in the water company, to obtain permission from the War Department. Despite the efforts of Senator Shoup, the War Department declined to grant permission to drill a well on the fort property.¹³⁵

In 1920, the Boise Barracks (as Fort Boise was then called) drilled their own water supply well. A second well was completed in 1940. The wells were used for domestic purposes at the Barracks until approximately 1990 when the Veterans Adminis-

tration (the current owner/tenant at the old fort) connected the facility to United Water's system. The Veterans Administration connected the two wells to the Old Sonna Reservoir and the water is used for landscape irrigation and fire protection.¹³⁶

Penitentiary Water Supply

In 1870, construction began on the Idaho Territorial Penitentiary, located approximately one mile east of Boise at the base of the foothills (see Figure 4). Construction was completed in 1872.¹³⁷ Initially the penitentiary hauled water for the prisoners in barrels.¹³⁸ In 1889, Mr. D. B. P. Pride started to enlarge a spring on his land behind the penitentiary by excavating a tunnel into a hill east of the prison in an unsuccessful effort to increase the spring flow.¹³⁹ In July 1889, the warden, using prison labor, including some who were miners, took over construction of the tunnel. The tunnel was located 2,060 feet east of the prison buildings. At a distance of 635 feet from the tunnel mouth, they obtained a flow of approximately 70 gallons per minute. At the end of the tunnel, they drove two steel pipes 75 feet further back into the hill. One pipe was horizontal and the other one was slanted slightly downward. In order to increase the flow of water, a branch tunnel was constructed 540 feet from the original tunnel mouth and extended 350 feet east toward Table Rock. The additional branch tunnel increased the flow of water to approximately 100 gallons per minute. The cost of the tunnel, not including the prisoner labor, was \$1.30 per foot for timbering, blasting powder, and tools.¹⁴⁰ Water was piped from the tunnel to a reservoir constructed between the tunnel and the prison. The reservoir was located 1,320 feet east of the prison buildings on a hill at an elevation approximately 75 feet above the prison buildings. The reservoir was 30 by 70 feet and 8 feet deep and held 125,000 gallons of water. Water from the reservoir was piped to each cell house, office building, the warden's house and the guards' quarters. Excess water was used for irrigation of land near the prison. Although the initial flow was approximately 100 gallons per minute, by 1891 the flow of water from the tunnel had decreased to five gallons per minute.¹⁴¹ In 1892, the prison attempted to obtain water from a second water tunnel dug into the hills east of the prison. The tunnel was six feet high, four feet wide and 199 feet long. However, only a meager supply of water was obtained.¹⁴²

In the early 1890s, the prison drilled a hot water well, but it was abandoned by 1894 due to low flow caused by the high flow rate from the nearby Artesian Hot and Cold Water Company's wells.¹⁴³ To meet part of their needs, the prison collected excess hot water from the water company's overflow valves and used the water for irrigation.¹⁴⁴ The water problem continued

Figure 17.
*Trace of Penitentiary
Canal near Rocky Point*
(photo by author, 2006)



into the twentieth century with the water tunnels only supplying five gallons of water per minute. In 1905 another tunnel (approximately 240 feet long) was dug into the hills east of the prison, but no water was found. That same year, a water well was dug near the southern boundary of the prison, near the Boise River. The well, 55 feet deep and 21 feet in diameter, was lined with stone from the prison quarry.¹⁴⁵ On April 20, 1908, work started on a canal to bring water to the prison. The canal's headgate was located approximately 7.5 miles from the Penitentiary at the Diversion Dam constructed for the New York Canal.¹⁴⁶ Although water from the Penitentiary Canal is currently used for irrigation in the Harris Ranch area, the portion of the canal that served the penitentiary was abandoned. A trace of the canal is still visible on the hillside near Rocky Point and Warm Springs Avenue (See Figure 17).

In 1908, a water well was dug inside the prison walls. Water was pumped from the well into a reservoir on the hill northeast of the prison.¹⁴⁷ In 1917, the water supply problem was resolved when the prison was connected to the water company reservoir west of the hot water wells. Connection to the water company distribution system was due in part to the fact that the prison water system was insufficient for fire protection.¹⁴⁸

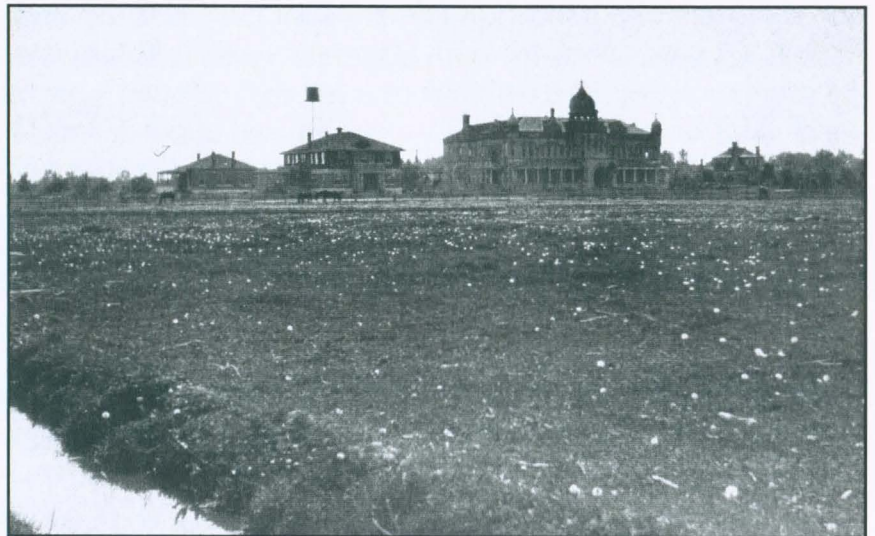
Idaho State Soldiers Home Water Supply

In 1893, the Idaho legislature appropriated \$25,000 for construction of a State Soldiers' Home. An additional \$4,791 raised by the citizens of Boise was used to purchase a 40-acre site about two miles west of town. Approximately 20 acres of the site was marshland. The Legislature appropriated an additional \$28,000 in 1895 and the home was completed in May 1895. Prior to the arrival of the first residents, the superintendent stated that the "engine and pumping machines for furnishing water for the building was found to be entirely inadequate." In 1896 a well

was dug to supply the home with domestic water. The well was located approximately 200 feet from the main building. Water was pumped to a tank on top of a 60-foot high water tower.¹⁴⁹ Water for the grounds and livestock was provided by the Boise Canal Company.¹⁵⁰ In 1900, the home was destroyed by fire, but was later reconstructed on the same site. In 1903, the water system was improved when a new brick pump house, and a 75-foot steel tower with a 2,500-gallon storage tank was constructed (Figure 18). The cost of the pump house, steel tower and tank was \$2,050.¹⁵¹

In 1911, the State Board of Health and the Soldiers' Home doctor stated that the water was undesirable for domestic use. The superintendent recommended drilling an artesian well to provide a supply of "pure water" and sufficient water for fire protection and lawn irrigation.¹⁵³ It is unclear whether the well was dug, and no records of the well have been located. In 1966, the Idaho Soldiers' Home was abandoned and the soldiers relocated to the Veterans' Administration campus at the old Fort Boise site.

Figure 18.
*Idaho State Soldiers Home
and Water Tower*¹⁵²



Other Water Wells or Water Systems in the City

Although the City of Boise does not provide domestic water services, the city does own approximately eighty water wells and pump systems used for irrigation at various city parks. In addition, numerous private wells exist or existed in the city. The Owyhee Hotel, the Boise Canning Company, Boise Gas-Light Company, Oregon Short Line Railroad, Boise Cold Storage and other industries with high water use installed their own water wells. When the new State Capitol Building was constructed (1905-1913), artesian wells were drilled to supply water to a power plant and boilers that provided electricity and heat for the building.¹⁵⁴ Figure 19 shows the water storage tank and water well for the Oregon Short Line railroad. The water well is

located under the small tripod structure behind the building in the center of the photograph.

Many areas adjacent to the city were developed using individual water wells and septic tank systems. In 2006, United Water and Capitol Water Company services were available in the city and most residences were connected to the water systems. However, many individuals still retained their water wells for lawn irrigation and some homeowners and businesses continued to use wells for domestic consumption. These wells ranged from 25 feet to more than 400 feet in depth. Based on well records on file with the Idaho Department of Water Resources, several hundred water wells exist in the city in addition to the public water supply wells owned by United Water, Capitol Water and the irrigation wells owned by the City of Boise.

Figure 19.
*Oregon Short Line Railroad
Water Storage Tank*¹⁵⁵



Water Well Drilling

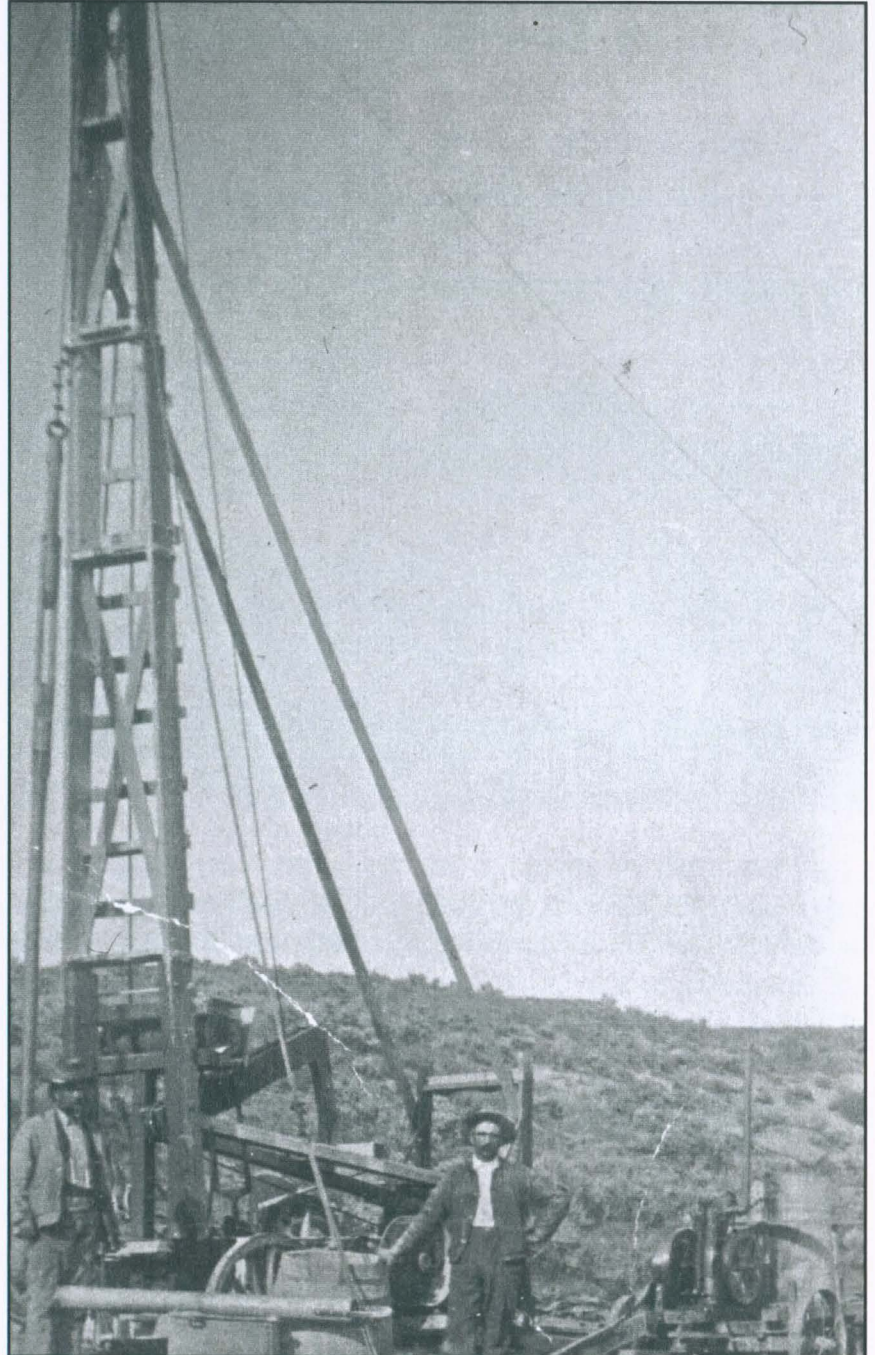
Two water well drillers played an important role in Boise's early water supply. John Grumbling drilled many of the water wells for the water company and Major Hall drilled many of the private water wells in the Boise area, including the well at the Owyhee Hotel. Both drillers used cable-tool drilling rigs.

At the turn of the 20th century, cable-tool drilling was the standard method of constructing water wells. A drill bit, shaped like a chisel was suspended in the hole on a steel cable and repeatedly raised and dropped to break up the rock. The crushed rock or cuttings were removed by pulling the drill bit out of the hole, adding water and lowering a bottom-filling bailer to remove the slurry of water and rock chips. Then the bit was re-introduced into the borehole and the process was repeated until the desired depth was reached. Drilling was then stopped and a pipe or casing was lowered into the well. Power was required to lift and drop the bit, remove the cutting, and to lower and remove pipe or casing from the well. Although the time necessary to drill

a well depended upon the depth and type of rock being drilled, one 500-foot-deep well in Boise was completed in just over one month at a drilling rate of approximately fifteen feet per day.

Although the drilling rig pictured with Hall (Figure. 20) was steampowered, Hall also owned horse-powered rigs.¹⁵⁶ Permanent derricks, such as those shown in Figures 2 and 22, were erected for drilling larger-diameter wells. In addition to providing a platform to suspend the drilling cable, the drillers used the derricks to lower casing into the well and to install and remove pumps. Cable-tool drilling rigs are still used to drill water wells, although the technology has largely been replaced with rotary drilling methods.

*Figure 20.
Major Hall and Steam Powered
Cable-tool Drilling Rig¹⁵⁷*



BOISE'S GEOTHERMAL WATER RESOURCES

Figure 21.
*Kelly Hot Springs Resort*¹⁶⁰

Historically a number of hot water springs surfaced near the foothills north and north-east of Boise. The source of the springs is deep percolation of precipitation and snowmelt into the fractures of the Idaho Batholith, which forms the granitic mountains north of Boise (see Figure 3). The water, after percolating to depths of more than 7,000 feet, returns to the surface through faults and fractures that occur along the foothills.¹⁵⁸ The areas near the springs were used by Native Americans who made the Boise Valley their home before the coming of the Europeans. The largest and best known spring was located northeast of Table Rock. In May 1871, J. L. Stephens, a local physician, opened the Boise Warm Springs Spa, which contained a steam bath, showers and a plunge pool. The spa was enlarged in 1873 and a bathhouse added. The Spa was renamed Kelly Hot Springs in 1889 when the spring was purchased by Dr. Milton Kelly.¹⁵⁹



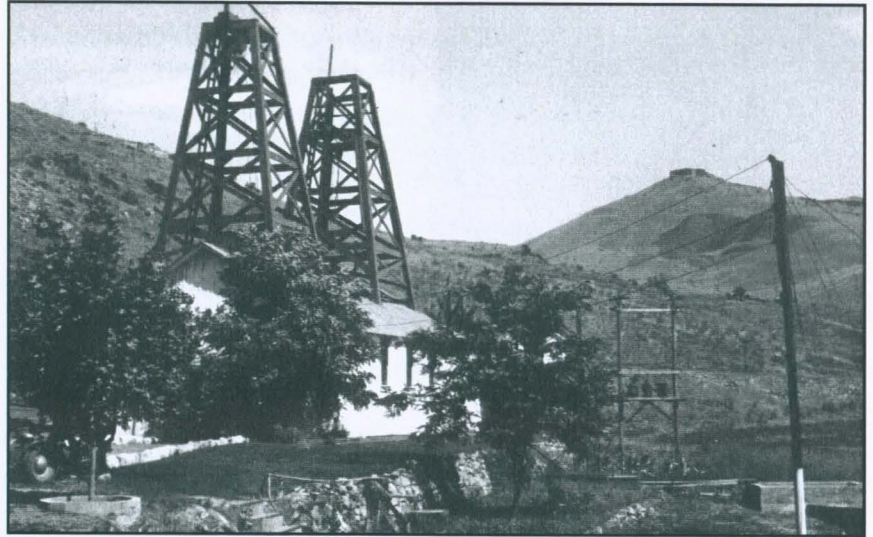
A second hot springs area was located west of Table Rock near the State Penitentiary where the ground was warm, snow did not accumulate, and animals frequently became bogged down in the mire.¹⁶¹

Boise's First Geothermal Water System

In 1890, John Grumbling approached Boise Water Works with the idea of drilling an artesian hot water well near the swampy area. The water company took an option on ten acres of land from Robert Wilson and began exploration for hot water. By March 1891, Grumbling had completed two hot water wells about 300 yards west of the State Penitentiary. Well No. 1 and Well No. 2 were 395 and 404 feet deep, respectively. The wells were flowing artesian wells, and under natural pressure flowed at a combined rate of approximately one million gallons per day. The temperature of the water was 170 degrees

Fahrenheit.¹⁶² In 1894, a third well was drilled to a depth of 455 feet.¹⁶³ In 1909, two new sixteen-inch diameter wells were drilled and the old wells abandoned.¹⁶⁴ Figure 22 is a photo of the well house with the drilling derricks still in place. The derricks, typical of the permanent derricks used with cable-tool drilling rigs of that time period, were used to set and pull pumps in the wells. The tops of the derricks were later cut off, but the legs form the internal support for the building. The building is on the National Register of Historic Buildings.

Figure 22.
Hot Water Well House and
Drilling Derricks (circa 1920)¹⁶⁵



The initial natural pressure of the artesian wells was reported to be sufficient to force hot water to the top floor of a five-story building.¹⁶⁶ When the artesian pressure began to decline, the company experimented with air compressors to increase the flow of water. Later, when water levels continued to drop, the

Figure 23.
Geothermal Well Pump
Circa 1920¹⁶⁸



water company drilled larger-diameter wells and installed pumps to maintain the necessary flow.¹⁶⁷ Figure 23 shows a variable speed pump installed in one of the wells in the 1920s.

Although the location and exact number of hot water wells drilled in the immediate area of the penitentiary is unknown, Mr. Bob Griffiths, retired manager of the Boise Warm Springs Water District, recalled seeing two abandoned

Figure 24.
Hot Water Overflow
from Geothermal Well¹⁷¹



wells in addition to the existing two geothermal production wells. One well, referred to as the Behrman Well, was located southwest of the hot water well house in a low lying area covered with brush. Griffiths observed a four-inch well casing extending approximately one foot above ground surface with a slight artesian flow of warm water. He also observed a six-inch well casing east of the current well house.¹⁶⁹ In addition to

using the hot water in the Natatorium and homes along Warm Springs Avenue, the water company authorized the Penitentiary to make a $\frac{3}{4}$ -inch connection to the hot water pipes for a fee of \$10 per month for the first 100 prisoners and \$1 per month for each additional ten prisoners.¹⁷⁰ In the early 1900s, when hot water was not required for heating, hot water was also collected from an overflow valve and used to irrigate crops at the penitentiary.

The second well Griffiths observed was located on the penitentiary property and may be a hot water well drilled by the Penitentiary in the late 1890s.¹⁷² Due to the pumping of the water company's hot water wells, the supply of hot water from that well was insufficient and in 1927 the penitentiary entered into a contract with the water company for a supply of hot water. The contract restricted the penitentiary from drilling a well within 5,000 feet of any existing hot water well. Both the warden's house and the Bishop house were heated with water from the water company's wells.

In addition to supplying hot water to residences along Warm Springs Avenue, hot water pipes were laid along Idaho Street as far west as Tenth Street to provide hot water to the Boise National Bank and the Sonna Block. Both structures were owned by officers of the water company.¹⁷³ In 1905, residential hot water rates ranged from \$93.75 to \$1,112.50 per year, depending on the size of the connection. Hotels, boarding houses and schools were charged \$25 to \$50 per year in addition to the connection charge.¹⁷⁴

The potential economics of the hot water supply played a

decisive role in the future of the domestic water supply of Boise. In 1890, The Artesian Water and Land Company was organized to compete with Boise Water Works and both companies battled to supply domestic and fire protection water to the city. The addition of the hot water wells gave the Boise Water Works Company an advantage over the competing water company and on March 27, 1891, Boise Water Works and the Artesian Water and Land Improvement Company consolidated into a new company, the Artesian Hot and Cold Water Company Limited.

The Boise Warm Springs Water District is the successor to the hot water interest of the Boise Hot and Cold Water Company. By 1974, the system needed extensive repairs and 200 homeowners and several businesses formed the Boise Warm Springs Water District and took over the system.¹⁷⁵ In 1981, the Boise Warm Springs Water District drilled a geothermal well about 650 feet northwest of the two existing hot water wells. However, insufficient hot water was encountered and the well is now used to monitor water levels in the geothermal aquifer.¹⁷⁶ In 1998, the Boise Warm Springs Water District supplied water to 226 homes and 36 commercial buildings. In 2006, the water district served approximately 287 customers. Figure 25 is a hot water radiator used to heat a restored home on Warm Springs Avenue.

Figure 25.
*Hot Water Radiator in Restored
Home on Warm Springs Avenue
(photo by author, 2006)*



Some residents along Warm Springs Avenue use the hot water for all domestic hot water needs, including heating, showers and laundry. The water is also used in hot tubs. Residents living on the south side of Warm Springs Avenue discharge the spent water to the Jacobs Canal, now the Boise City Canal. Residents on the north side discharge to dry wells or to the city sewer. The average annual production of hot water is approximately 209 million gallons per year and the average temperature is 177 degrees Fahrenheit. Water levels in the wells vary from 20 to 100

feet below ground surface. In June 2006, the water levels in both wells were approximately 30 feet below ground surface.¹⁷⁷

In addition to the Boise Warm Springs Water District there are three additional major geothermal systems in Boise and several private geothermal wells. Total production of hot water from all geothermal systems in Boise is approximately 600 million gallons per year.

Fort Boise/Veterans' Administration Campus

In June 1899, Fort Boise drilled a 900-foot-deep hot water well. Hot water, at a temperature of 124 degrees Fahrenheit, entered the well at a depth of 516 feet. A second well was drilled to a depth of 400 feet and the water temperature was only 84 degrees. The appropriations for the second well were exhausted before the well could be completed.¹⁷⁸ Almost 100 years later, the Veterans' Administration drilled three geothermal wells at the old fort. Water from the wells is used to heat twenty-two separate buildings on the Veterans' Administration campus.

City of Boise

In 1983, a private company, Boise Geothermal Limited, drilled four geothermal wells near Military Reserve Park and began experimenting with geothermal heating. In 1988 the City of Boise purchased the assets of Boise Geothermal.¹⁷⁹ The water is used to heat more than 50 buildings in the downtown area, including City Hall and the Ada County Courthouse. Figure 26 is a photo of one of the City's wells in Military Reserve Park.

Figure 26.
City of Boise Geothermal Well House (photo by author, 2006)



Capitol Mall Complex

In the 1970s, the State of Idaho expanded the Capitol Mall complex and considered using geothermal water to heat the state buildings. The state initially experimented with geothermal heating in 1977 when it converted the heating system at the

State Health Department's laboratory near the old Idaho State Penitentiary to geothermal heating using water from the Warm Springs Water District. Two new geothermal wells were completed in 1981 near the State Capitol buildings. Well No. 2 is 3,030 feet deep and is used for production of hot water. The maximum flow is 900 gallons per minute. Well No. 1 is 2,150 feet deep and is used to inject the spent hot water. The geothermal heating system provides approximately 90 percent of the heating requirements for the Capitol Complex and saves the State more than \$400,000 per year in natural gas heating costs.¹⁸⁰

Other Hot Water Ventures

Two other early 1900s hot water ventures were proposed but did not succeed. Joseph Perrault, who owned Kelly Hot Springs, considered installing a hot water system to compete with the water company. In addition, Dr. William Grigshy, who owned land north of Kelly Hot Springs, constructed a 400-foot-long tunnel under a hill on his property and encountered water at a temperature of approximately 180 degrees Fahrenheit. Neither of these hot water systems became a commercial success.¹⁸¹

In 2006, there were approximately 150 private geothermal wells in the Boise area used to heat swimming pools, buildings and greenhouses.¹⁸² Edwards Greenhouse, located in north Boise, was heated by a geothermal well drilled in 1927. Before the greenhouse was constructed, the geothermal well was used to irrigate vegetables and produce for the local market.¹⁸³

Natatorium

In April 1891, after the completion of the hot water wells and the merger of the two water companies, C.W. Moore visited Broadwater Natatorium in Helena, Montana, and in June the Water Company retained the Helena architectural firm of

Figure 27.
*Natatorium Plunge Pool
and Roof Support Arches*¹⁸⁵



Paulsen and Leville to design the Boise Natatorium.¹⁸⁴ John C. Paulsen was the designer of the Broadwater Natatorium and he used it as a model for the Boise Natatorium. Consequently, the interior arch system, the plunge pool and grotto in the Boise Natatorium were similar to those in the Broadwater (see figure 27).

The construction contract for the Natatorium was awarded to D. P. Workman on September 14, 1891, and required completion of the Natatorium by February 14, 1892. Several construction delays occurred and on February 13, 1892, the Water Company notified the contractor that penalties of \$25 per day would be charged until the building was completed.¹⁸⁶ The contractor blamed the delays on problems with the specifications. In addition to design issues that caused construction delays, the relationship between the water company and the architect was not always agreeable. The company disputed a claim by Paulsen for a five percent architect fee for the installation of the indoor heating system. In a letter to Paulsen dated August 28, 1892, H. B. Eastman denied the fee based on the fact that Paulsen neither designed the system nor supervised the installation, and in fact was opposed to the contractor selected to install the heating system.¹⁸⁷ In addition to the quibbles with the water company, Paulsen had other problems and committed suicide in 1897, just days before he was to be indicted by a grand jury for taking kickbacks during construction of several public buildings in Montana.¹⁸⁸

*Figure 28.
Cold Water Storage Reservoir
near Hot Water Wells
(circa 1920)¹⁸⁹*



In April 1891, a contract was awarded to the Puget Sound Pipe Company for the construction of a cold water reservoir near the hot water wells. The reservoir was used to hold water from the water company's cold water artesian wells in Hull's Gulch. Figure 28 is a photograph of the cold water storage reservoir and Figure 29 is a photograph of the remains of the reservoir foundation, still visible near the hot water well-house.

Figure 29.
*Foundation of Cold Water
Reservoir near Hot Water Wells.*
(Photo by author, 2006)



Cold water and hot water were both carried to the Natatorium in separate pipes buried in the same trench.¹⁹⁰ Hot water was piped to the Natatorium via a wooden pipeline (see Figure 30). However, this proved to be unsatisfactory and the pipeline was replaced in 1896 with a metal pipe.¹⁹¹

Construction of the Natatorium was completed in March 1892 and the plunge pool was filled with water on March 31, 1892. An unfortunate accident occurred that same night. Frank Dymond and C. C. Galantine entered the water to take a bath, although neither individual had permission to be in the building. Frank Dymond could not swim and drowned.¹⁹²

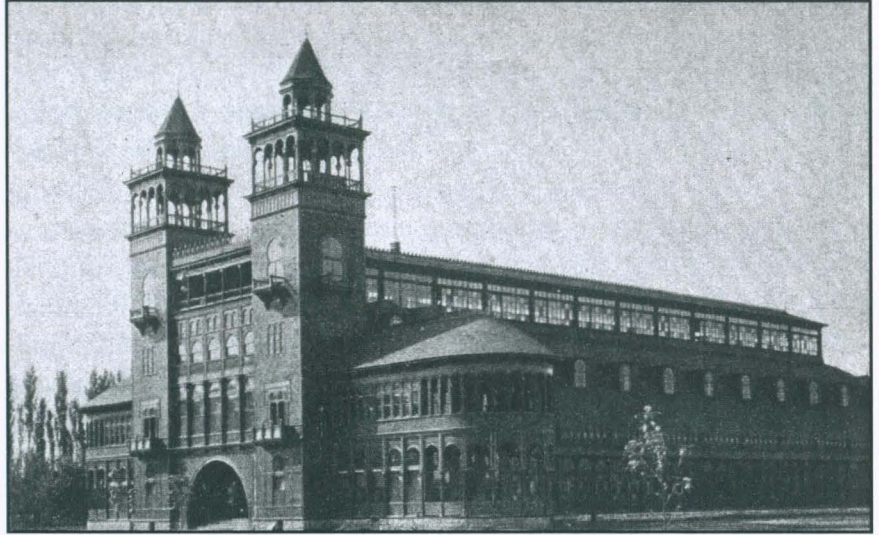
The Natatorium opened for business on May 25, 1892. For a twenty-five cent admission ticket, visitors had access to all portions of the Natatorium. The minimum fee was designed to keep "objectionable persons upon the outside."¹⁹³ The Natatorium was a 15,000-square-foot, three-story building that contained a 65 by 125 foot hot water swimming pool (See Figures 27, 31 and 32). The "Nat" offered hot tubs, steam tubs, Turkish baths and had smoking and reading rooms. The pool could be drained

Figure 30.
*Wooden Water Pipe Used in
the Boise Water System.*
(Photo by author, 2005)



and covered with a wooden floor for events such as dances and inaugural balls. Although the Natatorium only had a small bar, a speaker at the YMCA described it as “a big saloon with a little pool thrown in.”¹⁹⁴ The Natatorium was not a complete financial success. In November and December 1893, Natatorium receipts were \$511.42, which included \$191.92 in revenues from the bar. Total expenses were \$591.46, resulting in a loss of \$80.04 for the two-month period. The Natatorium subsequently reduced staff to minimize losses.¹⁹⁵

Figure 31.
*Boise's Natatorium*¹⁹⁶



The supply of water from the hot water wells was in excess of the Natatorium's needs and the water company explored the possibility of providing residential hot water. Two of the company officers, C. W. Moore and H. B. Eastman successfully used the water to heat their homes on Warm Springs Avenue. Soon other residents signed up for hot water at a rate of \$2 per month for a small house and \$3 per month for a large house. Boise thereby became the first city in the United States to use geothermal water to heat private homes.¹⁹⁷ In 1893, the hot water assets, including the Natatorium, hot water wells, real estate, piping and

Figure 32.
*Natatorium Plunge Pool*²⁰¹



fixtures of the Artesian Hot and Cold Water Company was valued at \$112,054.57.¹⁹⁸

In 1913, the Artesian Hot and Cold Water Company was separated into two separate companies: one to supply domestic water, the other to supply hot water. The division of the company was specifically to avoid regulation of the hot water rates by the Idaho Public Utilities Commission. In 1916, the Natatorium was sold to the Boise Railroad Company, which subsequently went bankrupt in 1917. The Natatorium and the Railroad Company were then purchased by Walter Pierce.¹⁹⁹ On April 18, 1920, the water company repurchased the Natatorium and in October 1920, the Boise Artesian Hot and Cold Water Company changed its name to the Boise Artesian Water Company and sold the hot water system to the Natatorium Company. However, the stock of the Natatorium Company was entirely held by the stockholders of the Boise Artesian Water Company.²⁰⁰ Over the years, the Natatorium was the scene of many parties and was such an important part of the social scene that it was considered a "must-see attraction" in Boise.

In 1916, an earthquake near Cascade caused a wave in the pool which "resembled the motion of a tsunami, ducking swimmers and splashing over the north end of the pool."²⁰² In 1934 the Natatorium was closed due to damages sustained to the wooden structure over several years. The "Nat's" demise became final when part of the roof collapsed in a high wind. The Nat's pool was refurbished and is now the site of a city-owned swimming pool and hydro tube.

SANITATION AND WATER SUPPLIES

Prior to 1867, government functions in Boise were carried out by Ada County, which had very limited powers related to health, sanitation or water supply. The Idaho Legislature granted municipal governments in Idaho the power to regulate activities which posed a public nuisance and to impose regulations to "prevent the introduction of contagious diseases in the city" and "provide for the health, cleanliness, ornament, peace and good order of the city."²⁰³ This included the authority to issue bonds (if approved by two-thirds of the voters) to install water and sewer systems. As the city grew, the council passed several ordinances requiring residents and businesses to keep their premises clean. The ordinances were frequently ignored and the city considered retaining a contractor to haul rubbish from the alleys.²⁰⁴

Industries and businesses that produced large volumes of liquid waste were typically located along the Boise River or drainage ways where the waste could be discharged. In the early 1900s, two slaughterhouses, Boise Butcher Company and Capital Meat Company, were located near the Boise River. As late as 1964, the Davis Packing Company in Garden City, Swift Meat Packing in Boise and Liberty Meat Packing in Eagle all discharged waste directly to the Boise River.²⁰⁵

Although Boise had the authority to prevent activities which caused pollution, little was known about the connection between polluted water and disease. Because of this lack of knowledge, water wells were frequently constructed near outhouses, cesspools, sewers and polluted streams. In Silver City, Idaho, a well and a privy were constructed in the same building, less than 10 feet apart.²⁰⁶ In the 1800s, many cities in Europe and the United States were supplied with untreated river water. As cities grew more crowded and sewage became concentrated, waterborne diseases such as typhoid became common. Until 1858, when Louis Pasteur identified the existence of germs, the "Miasma" theory held that diseases such as typhoid and cholera arose spontaneously in dirty, enclosed places.²⁰⁷ The germ which causes typhoid fever (*Salmonella typhi*) was not discovered until 1880 by C. J. Eberth.²⁰⁸ In the 1850s and 1860s, even before the typhoid germ was identified, the connection between typhoid, sewage and contaminated drinking water was documented in England, albeit not all medical doctors accepted the evidence.²⁰⁹ By the 1870s, the medical profession in Idaho was aware of the connection between typhoid and drinking water contaminated with sewage.²¹⁰ In 1872, a typhoid fever outbreak in Silver City, Idaho, was attributed by the local physician to drinking water from Jordan Creek. At that time, many outhouses were constructed near, or in some cases over, Jordan Creek. Dr. Colmache suggested that residents drink from the springs above town

instead of using the creek water.²¹¹ In March 1892, the editor of *The Idaho Daily Statesman*, quoting from *Engineering Magazine*, noted that drinking water that contains a large number of bacteria should be boiled for one-half hour before being used for drinking or culinary purposes.²¹²

In 1900, a higher than average number of contagious diseases occurred in the north end of Boise. The public water system was not blamed for the outbreak because many residences obtained water from private wells "into which flows the slimy, germ-breeding corruption from [cess] pools and closets."²¹³ Additional typhoid outbreaks plagued the city in 1904 and 1905. Although the water supply was generally thought to be a potential cause, other sources including vegetables, natural ice, and dairy products were also identified.²¹⁴ In 1905, forty-four cases of typhoid occurred in a two-week time period.²¹⁵ City Councilman Hubbard questioned if the water company was responsible for the "prevalence of typhoid fever in the city." He also questioned if the company was providing "filtered water" and implied that if a filter existed, it was located in the vicinity of China Gardens where the "offal of the city is used as fertilizer."²¹⁶ During the 1905 typhoid outbreak, Dr. L. C. Bowers, the city physician, concluded that there did not appear to be a single source of typhoid, as some people who contracted the disease were using private wells while others were connected to the public system. Several people who came down with typhoid purchased vegetables from the Chinese gardens and some purchased vegetables from other sources. In addition, different dairies supplied the milk drunk by the infected parties.²¹⁷

In 1921, when a typhoid outbreak occurred in Boise, approximately 12 percent of the city's domestic water was supplied by artesian wells in Hull's Gulch and the remaining 88 percent was supplied from the shallow large-diameter water wells near the Boise River. At that time, Well No. 3 was the only shallow infiltration well being used. However, all three shallow wells were connected together and were also connected to the river by infiltration galleries. At the time the shallow wells were constructed, filtration of the river water through the sand and gravels under and adjacent to the river was an accepted method for treatment of surface water and many American cities used this technology.²¹⁸

On November 6, 1920, a sample of water collected from Well No. 3 tested positive for coliform bacteria. Samples from the water distribution system tested negative. During November and December 1920, additional water samples collected from Well No. 3, the distribution system and the storage reservoir near the Penitentiary all tested positive for bacteria.²¹⁹ On January 1, 1921, the first case of typhoid was reported in Boise and

on Monday, January 4, 1921, Jose Arrube, 21 years of age, died of typhoid fever in a Boise hospital.²²⁰ On January 5, 1921, the medical advisor of the State Department of Public Welfare issued the following advisory: "Owing to the extremely mild winter and the rapid fluctuation of the water level of the river, people are advised to boil all water used for drinking and culinary purposes for 15 minutes, until conditions improve."²²¹ The newspaper article did not indicate that bacteria had been detected in the water supply system or mention the death of Jose Arrube caused by typhoid. *The Idaho Statesman*, like other urban "boosters," frequently downplayed unwelcome news.²²² Arrube's death was reported in the section of the paper reserved for births, deaths, and marriages. Apparently, neither the health department nor the newspaper wanted to panic the public.

In an interview with *The Idaho Statesman* on January 9, 1921, Mr. Markhus, an official with the Boise Artesian Water Company, stated: "While we are not at all convinced that the water is unsafe, we believe that warnings issued to boil all drinking water are a proper precaution, particularly in view of the unusual amount of rain and warm weather we have experienced this winter, causing an unusual surface runoff into the river."²²³ The water company had reason to deflect blame for the typhoid deaths. In 1915, the Supreme Court of New Jersey found in favor of Mr. B. H. Jones in a case against the Mt. Holly Water Company. In a typhoid epidemic in 1912, three of Mr. Jones' children became ill with typhoid. The jury awarded Mr. Jones \$750 in damages.²²⁴

When the Boise Artesian Water Company was notified of the bacteria problem, chlorination equipment was not in use. By 1915, it was well known by public health officials and sanitary engineers that chlorination could reduce the incidences of typhoid. Despite this knowledge, many American cities still relied on filtration.²²⁵ The water company borrowed a temporary chlorinator from a company in San Francisco and ordered a permanent chlorination system from New York.²²⁶ The temporary chlorinator was placed into use on January 12, 1921.²²⁷ From January 12 to March 2, 1921, no bacteria were detected in any water sample collected from the well or distribution system. However on March 2, 1921, health officials detected bacteria in water samples from the distribution system due to failure of the temporary chlorination equipment and a "Boil Drinking Water" notice was once again placed in the local newspapers. On March 26, 1921, Boise City Health Officer Dr. R. H. Pratt reported that the new chlorination equipment was functioning properly and that the drinking water was safe for use.²²⁸

After it was first suspected that the source of typhoid was the water system, the State and City health departments worked with the water company to determine the source of pollution.

Their initial surveys were unsuccessful so the water company and the State Health Department contacted Surgeon General Cummings of the United States Public Health Service, who sent Captain C. N. Harrub to Boise to investigate the contamination.²²⁹

At the time of the typhoid outbreak, the Boise Artesian Water Company obtained water from artesian wells in Hull's Gulch and shallow infiltration wells near the Boise River. Testing of water samples from the artesian wells showed they were not contaminated. The focus of the investigation centered on the potential sources of contamination of the shallow wells. These wells were very near the Boise River and two infiltration galleries were actually under the river. During periods of high river flows when the river was turbid, water in Well No. 3 was also turbid. The turbidity in the well indicated that natural filtration was insufficient to remove fine soil particles or bacteria from the water. Captain Harrub quickly concluded the most likely source of typhoid contamination was the Boise River. He identified two possible sources, including sewage from mining camps on Mores Creek and sewage from the City of Barber, located five miles upstream from the shallow water wells.

In 1921, the population of Barber was approximately four hundred people. All of the homes were connected to a septic tank that was eleven feet wide, twenty feet long, and ten feet deep. The effluent from the tank discharged via a pipe to a second tank that collected additional sewage from a boarding house. Captain Harrub's investigation revealed that both tanks were completely filled with solids, providing little or no retention time. The effluent from both tanks was discharged through a pipeline to the Boise River. Captain Harrub concluded that the Boise River, upstream of the shallow infiltration wells, was contaminated and that additional treatment of the water was necessary if the shallow wells continued to be used. Captain Harrub also suggested that, if sufficient water was available in Hull's Gulch, the water company consider abandonment of the shallow wells and rely on deep wells for the city supply.²³⁰

Prior to the 1921 typhoid outbreak, there were only twenty to forty cases of typhoid reported annually in Boise.²³¹ Twenty-six cases of typhoid fever were reported in Boise during January and February 1921, including seven deaths. By convention, epidemiologists report disease rates as cases per 100,000 persons. The population of Boise in 1921 was 25,000 people. Therefore, the incident rate for the 1921 outbreak was 104 cases per 100,000 with a corresponding death rate of 28 per 100,000. The mortality rate (calculated as the percent of people who died compared to the number who contracted the disease) was approximately 27 percent. This rate was significantly higher than

national typhoid mortality rates, which had been declining since the early 1900s. At the time of the typhoid outbreak, Idaho's death rate from typhoid was 9.7 per 100,000 population as compared to the US average of 9.0.²³²

Urban historians frequently cite the provision of poor quality water or high incident rates of disease as factors contributing to municipal takeover of private water supply systems. Although Boise experienced numerous outbreaks of waterborne disease, including typhoid, the city took no action to install its own supply or take over the private supply. Only one outbreak of typhoid was traced to the water system and the water company responded promptly, thus negating any serious discussion of acquiring the system.

Water Quality and Groundwater Contamination

Although both ground and surface water quality is generally good in the Boise area, both natural and man-made contaminants have impacted the ability of the private municipal water suppliers to provide domestic water which meets acceptable drinking water standards. Contamination by untreated human sewage resulted in several outbreaks of typhoid in Boise in the early 1900s. In the 20th and early 21st centuries, groundwater contamination by man-made organic chemicals has resulted in the shut-down of municipal supply wells as evidenced by trichloroethylene (TCE) contamination of the Terra Grande Water System in 2005. According to a United States Geological Survey study, man-made volatile chemicals have impacted more than eighty water wells in the Boise area.²³³ Naturally occurring contaminants, such as iron, fluoride and radium, have also resulted in municipal wells being taken out of production. Many of the water wells drilled in the 1960s and 1970s to supply water to the City of Boise had iron and manganese concentrations which imparted a color or taste to the water. In 1966, there were sixty-six water supply wells connected to Boise's public water supply system. At that time, approximately twenty-two of the wells did not meet the drinking water standards for a public water supply.²³⁴ To minimize customer complaints, the water was blended with better quality water, or treated to remove iron and manganese. In the 1970s, the Boise Water Corporation added crystalline phosphate to water from selected wells at a concentration of two parts per million to prevent iron and manganese from precipitating and causing discoloration of the water.²³⁵

Surface water quality is primarily impacted by non-point sources such as agricultural returns or run-off which contain numerous agricultural chemicals, including nitrate and phosphate. Animal and bird waste contributes to the occurrence of bacteria in the Boise River. Point sources of impact to the River are

primarily from sewage treatment plant discharges. Biological treatment of wastewater, followed by chlorination and/or ozonation, has solved the potential problem of contamination by disease-causing organisms such as typhoid. However, emergent contaminants such as undigested pharmaceuticals and other drugs will be expensive to remove from wastewater if required by future legislation. Although Boise's wastewater is discharged below the intakes for the city's water supply, up-stream development not connected to the city's sewer system could impact the quality of water obtained from the direct intake and the infiltration wells near the Boise River. In 2006, the Golden Age Mobile Home Park, located on the historic site of the town of Barber, discharged raw sewage to several lagoons adjacent to the Boise River.²³⁶ It is likely that the lagoons discharge to the underlying sand and gravel adjacent to the river. Although Boiseans have expressed concerns about possible upstream contamination from mining activities, there has been no public demand for the mobile home park to connect to the city's sewer system.

WATER USES IN THE CITY

In addition to water for domestic needs, water was necessary for numerous other city functions. Several of the more common uses are discussed below.

Water for Flushing Sewers

Historically, the residences, businesses, schools and government buildings in Boise, including the Capitol building, used privies or cesspools to dispose of domestic sewage. The city was frequently plagued with overflowing cesspools and sewage dumped into the irrigation canals and laterals which traversed the city. In 1882, the editor of *The Idaho Tri-Weekly* suggested that a sewer be constructed to discharge to Jacobs Ditch or to the Boise River. The sewer could be flushed with water from Cottonwood Creek or the Walling Ditch.²³⁷ The city took no action and new buildings and residences continued to depend on privies. The installation of the piped water system resulted in an increase in water use such that privies and cesspools became inadequate to dispose of the increased wastewater volume. On May 25, 1891, the Boise City Council met to consider the sewage situation and authorized a committee to visit such places as they may see fit to "ascertain the best system of sewerage."²³⁸ In June 1891, the city passed Ordinance No. 106 which authorized the city council to issue \$50,000 in voter-approved bonds for construction of sewers. The city awarded the sewer construction contract to Hobson & Wilkerson and work started on the sewer in mid-December 1891. The contractor hired more than 180 workers to dig trenches and lay pipe. By January 6, 1892, over one and a quarter miles of sewer had been laid and the outlet on Sixteenth Street was completed.²³⁹ The sewer outlet discharged to a branch of the Grove Street Canal (Boise City Canal) that returned excess water to the Boise River (see Figure 5). In February 1892, the city passed Ordinance No. 116 that prohibited the disposal of any waste in the sewer except for "faeces, urine, the necessary closet paper and liquid house slops." Houses or buildings located within 170 feet of a sewer were required to connect to the sewer.²⁴⁰

The new sewer system needed periodic flushing to keep solids from building up and blocking the sewer. But before the city secured a contract for water to flush the sewer, residents began to use the system. In March 1892, City Councilman Bryant reported that "homeowners must have forgot there was no water to flush the sewer, and if this practice was not stopped, there would be a lot of trouble."²⁴¹

The city originally intended to obtain water to flush the sewer from the Perrault Ditch Company but neglected to obtain a contract before the sewer was completed. Joseph Perrault, the ditch company owner, used this opportunity to seek relief for non-pay-

ment for water used to water trees on city property or rights-of-way. Although individual property owners paid the ditch company an annual fee for using water to irrigate their lawns and gardens, the ditch company received no payment for irrigation of the trees on city property. Perrault refused to turn any water into the irrigation ditches or provide any water for flushing the sewer until the city agreed to pay for the irrigation water. This created a problem for the city; with no water the trees would die, private gardens would dry up, there would be no water for street sprinkling, and the sewers would be unusable.

Mr. Perrault offered to turn the water into the canal and provide water to the city for both sewer flushing and for watering the trees for the sum of \$2,500 per year. Boise's Mayor, James Pinney, suggested imposing a tax of \$1 on each lot in the city to provide funds to buy the Perrault Ditch. Mr. Perrault offered to sell the ditch to the city for \$60,000 but his offer was rejected. City Councilman Dangel stated that at that price, "water would be higher than whiskey." Although Mr. Perrault ultimately reduced his price to \$54,000, the city again refused his offer.²⁴²

While the sewer sat unused, the city struggled to obtain a source of water. It entered a discussion with the State Penitentiary to jointly construct a canal to provide water to the city and the penitentiary. The state offered to provide free convict labor for the construction. As noted earlier, the city also entered into a discussion with two engineers, Foote and Wylie, who proposed to construct an eighteen-mile canal from Mores Creek to the city. Water would be provided for firefighting, street sprinkling, lawn irrigation and sewer flushing. The grade on the canal would provide sufficient head to produce electrical power. The engineers' proposal was not implemented.

On May 19, 1892, the city council accepted a proposal from the Artesian Hot and Cold Water Company to provide water for flushing the sewer for a fee of \$100 per month. The water company stipulated that flushing be performed at night, because there was insufficient water to flush the sewers during the daytime when water use was high. In May 1892, the city paid the water company \$144.56 for water for fire hydrants and sewer flushing.²⁴³ Several citizens complained that it would be better to pay the \$2,500 per year to Mr. Perrault for sewer flushing and tree irrigation, than to pay the water company \$1,200 per year to flush the sewer but let the trees die. On May 29, 1892, *The Idaho Daily Statesman* reported that the city and Mr. Perrault had come to an agreement on providing water to flush the sewer and water trees along city streets. The agreed upon price was \$1,800 per year.²⁴⁴ After May 1892, when water was available to flush the sewers, there were complaints that not enough people were connected to the sewer and that cesspools

in the middle of the city were still in use. In September 1892, a sanitary inspection of the city uncovered many filthy yards and cesspools.²⁴⁵ The city marshal ordered several businesses owners on Main Street to connect to the city sewer.²⁴⁶

Although the city passed a bond issue to lay the initial sewer lines, sewer service was not available in many areas of the city and many citizens continued to use privies. In 1894, the Grove Street Canal (Jacobs Ditch) was an open sewer. A reporter for *The Idaho Daily Statesman* examined the canal from Warm Springs Avenue to the western city limits and reported that the canal contained garbage and offal. In the Warm Springs Avenue area, several outhouses were built directly over the ditch and residents dumped "slop" directly into it. Dr. Sweet, chairman of the City Sanitary Committee, stated that numerous outhouses and filth in the Grove Street Ditch endangered the health of the city.²⁴⁷

On November 12, 1897, the city council passed Ordinance No. 231 which divided the city into eleven sewer districts. The creation of individual sewer districts was critical to improved sanitation in the city as the initial bonds approved by the voters were only sufficient to install the main sewer trunk lines. The districts were typically one block wide and extended from the north-south sewer along Sixteenth Street to the eastern city limits.²⁴⁸ The creation of sewer districts allowed property owners in any district to petition the city for sewer installation. If a majority of the property owners in a given district were in favor of it, the city ordered the installation of a sewer. The sewer was paid for by the property owners based on the width of their property's street frontage. A lien was placed on homes or business if the owners did not pay their share.

By 1900, the City of Boise had both a piped water supply and a sewer system in the central part of the city. The sewer discharged the untreated waste into a branch of the Grove Street Canal that emptied into the Boise River. At that time, Boise's population was approximately 6,000.²⁴⁹ Many industries, businesses and residences, especially those remote from the city center, continued to use cesspools and privies or had their own discharge pipe to the Boise River.

By 1904, the sewer system was too small and the city proposed building two new sewer mains consisting of 30,810 feet of new pipe. One branch collected sewage from the east and central part of the city and the other branch collected sewage from the north and northwest part of town. The two branch lines were connected at Twenty-Sixth and Washington streets and emptied into a fifty-two-inch diameter sewer which discharged to the Boise River. The project was estimated to cost \$158,858.50 and the contract was awarded to James Kennedy.²⁵⁰ The actual construction cost of the main sewer was \$123,302.32.²⁵¹ After

the installation of the sewer mains, new sewer districts were created and people within those districts were required to pay for the laterals and connections to the sewer. Although citizens raised a number of objections to the sewer, all of the protests were overruled by the city council. One of the objections was that the water company lines did not extend to all of the area covered by the sewer, and therefore water was not available to flush the sewer.²⁵²

Residences and buildings outside the sewer districts continued to use outhouses or privies. Larger institutions discharged wastewater directly to the river or creeks. In 1906, the sewer from the penitentiary was extended to a point on Warm Springs Avenue near the Natatorium; however, the line was not connected to the Boise sewer system until 1907. From 1906 to 1907, waste from the penitentiary sewer was discharged to the Boise River through a wooden flume.²⁵³

When the Idaho State Soldiers' Home was constructed in west Boise, the initial sewer drained to a water ditch or canal. The wastewater from the laundry was not connected to the main sewer and instead was run onto the ground surface, creating an unsanitary condition.²⁵⁴ In 1903, a six-inch diameter, 1,600-foot-long sewer pipe was constructed from the home to the Boise River.²⁵⁵

In 1916, the City of Boise contracted with A. R. Cruzen to supply water from the old Perrault Canal to flush the sewers. Ninety-six storage tanks were constructed at strategic locations and Cruzen was to provide water for eight flushings per day. Water was also to be provided once per year for flushing the sewer after rods and chains were used to remove obstructions in the sewer. The capacity of each tank was 450 gallons and Cruzen was paid \$3.40 per tank per month.²⁵⁶

For approximately sixty years after the initial construction of the city sewer system, all of the city's untreated sewage was discharged directly to the Boise River. The owners of an irrigation ditch downstream from the sewer outlet frequently complained about the sewer discharge.²⁵⁷ In 1947, Boise retained the Chicago engineering firm of Alvord, Burdick and Howson to evaluate the best method of treating and disposing of sewage. At that time, the population of Boise was 35,000 and the sewer flow from the city was approximately ten million gallons per day. The city's first wastewater treatment plant was constructed in 1950. Residences were charged a monthly sewer fee based on one-half the average water bill for the months of December, January and February.²⁵⁸

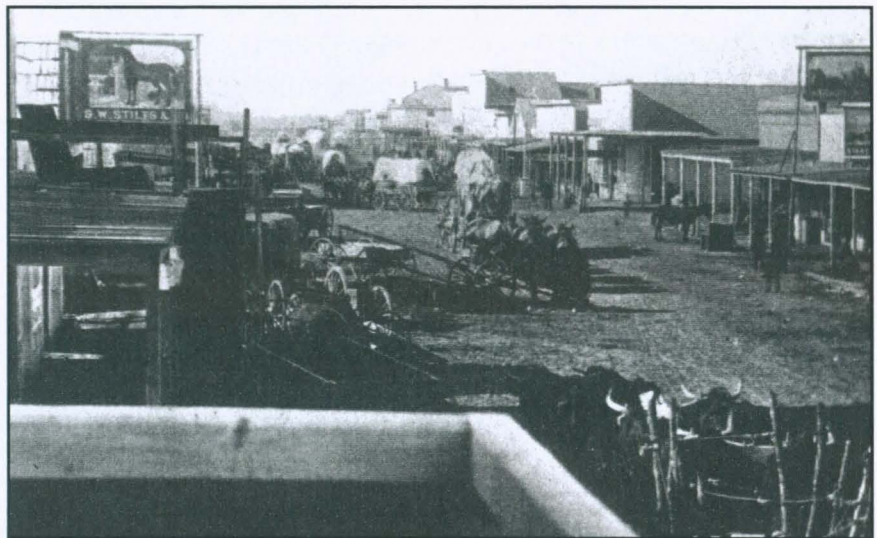
The city did not extend sewers to many remote areas of the city due to the cost. Residents in those areas who wanted to be connected to the sewer were forced to form their own taxing

districts to install the sewer lines and were required to pay the city for the cost of treating the waste. The Boise Bench Sewer District was created in 1959 to provide sewer collection for residents in South Boise. The Northwest Boise Sewer District was formed in 1968 and the West Boise Sewer District in 1975. Taxes are collected from the residents in the districts to pay for sewer lines and treatment costs. Boise may take over the sewer districts when the contract with each district expires.²⁵⁹

Street Sprinkling

Prior to paving, Boise's streets were dusty in the summer and muddy during the winter. To suppress summer dust, Boise merchants and residences hired contractors to sprinkle water on the streets.²⁶⁰ In 1894, the editor of *The Idaho Daily Statesman* called for the city to take action to prevent dust from the streets from hanging over the city and settling on tree foliage and citizens' clothes.²⁶¹ The dust consisted not only of dirt, but also horse manure from the numerous teams that pulled wagons up and down the city streets (see Figure 33).²⁶²

Figure 33.
Wagon Trains on
Boise's Dirt Streets²⁶³



In 1899, Boise passed an ordinance requiring certain streets or sections of streets to be sprinkled with water. Typically, the sprinkle contractor made three overlapping passes, one on each side and one pass in the middle of the street. Figure 34 shows a horse-drawn sprinkler wagon of this era.

The City Council determined when it was necessary to sprinkle the streets and the sprinkling contractor was to present his bill to the city on the first Tuesday of each month. To pay for the service, owners of property that abutted the streets requiring sprinkling were assessed a special tax. In 1899, the tax was twelve cents per foot of abutting property for sprinkling four times per day and six cents for sprinkling two times per day. The collected taxes were placed in a special fund reserved for street sprinkling

Figure 34.
Water Sprinkler Wagon,
Deer Flats Reservoir.²⁶⁴



and were not mingled with other tax money.²⁶⁵ Initially, street sprinkler contractors obtained water from the waterwheels on Grove Street or other water ditches (See Figure 35). In 1901, the city paid for the repairs to a waterwheel located between Ninth and Tenth streets so that city street sprinkling contractors could use it.²⁶⁶ Contractors using the pressurized water system obtained water from sprinkler stands or water hydrants. Citizens frequently complained about sprinkler wagons and teams blocking intersections while filling the wagons.

Figure 35.
Street Sprinkling Wagon
Filling Up at a Waterwheel²⁶⁷



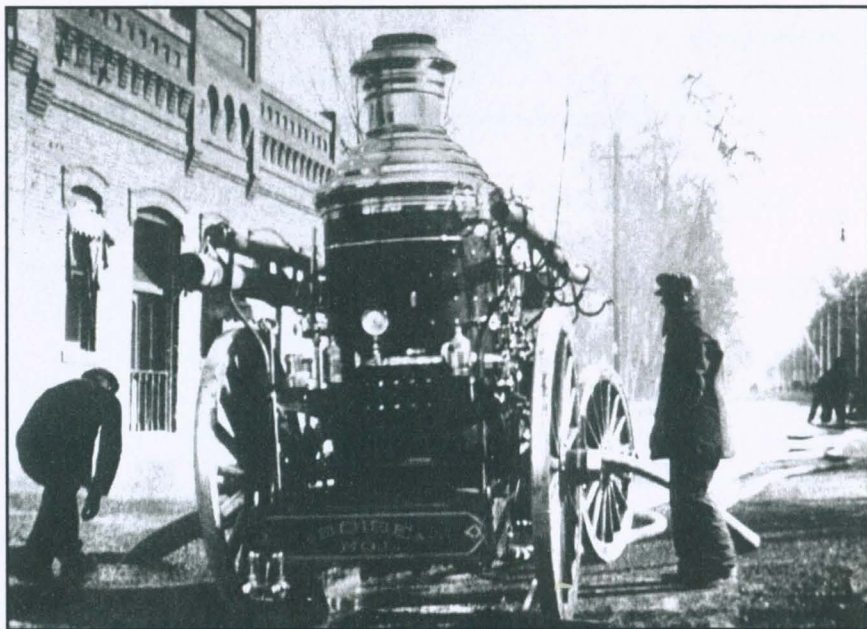
The city obtained a portion of the water used for sprinkling streets from the Capital Water Company, which in turn obtained water from the Cruzen Ditch. Water was distributed for lawn irrigation and street sprinkling by gravity through a wooden pipe. Water was taken directly from the canal with no filtration and customers frequently complained about the turbidity, seeds, and weeds in the water. Although there were several fire hydrants connected to this water system, the fire department did not often use them due to low pressure and mud in the hydrant connections.²⁶⁸

City street sprinkling contractors also obtained water from the Boise Artesian Hot and Cold Water Company. In 1897, the water company charged the city two cents per front foot for water for sprinkling the streets twice per day.²⁶⁹ In June 1902, during a dispute over water rates, the water company filed for an injunction to prohibit the city from taking water for sprinkling the streets.²⁷⁰ In 1910, the Boise Artesian Hot and Cold Water Company and the Capital Water Company charged the city \$29,384.19 to provide water to the city's street sprinkling contractors.²⁷¹ The Boise Artesian Hot and Cold Water Company required a special contract with anyone who wanted to use water for street sprinkling. In 1920, the city contemplated purchasing its own equipment to sprinkle the streets. A private contractor offered to sell the city fifteen water wagons and fifteen teams of horses with harnesses to the city for \$10,000; however, the transaction did not occur.²⁷²

Fire Protection

Fire was a constant threat in Boise and the surrounding mining towns because many of the buildings and residences were constructed of wood. The Boise City Fire Company was formed on January 24, 1876. Prior to that date, Boise did not have any type of firefighting organization.²⁷³ A local blacksmith company, Marston and Donohue, built the first hand-drawn wagon equipped with hook, ladders and rope for \$300. Three years later, the Boise Fire Department purchased a steam pumper (see Figure 36).²⁷⁴

Figure 36.
Boise Fire Department's
First Steam Pumper²⁷⁵



The response time for the hand-drawn steam pumper was seven to ten minutes, which was too long to save many buildings. Before the piped water system was installed, several

cisterns were maintained in the downtown area to provide water for fighting fires. If the fire was not located near a cistern, the pumper obtained water from irrigation ditches, and the pump often filled with sand before the fire was put out.²⁷⁶ In addition, the pumper had only 1,000 feet of hose, which was insufficient to reach from the cisterns or irrigation ditches to many of the buildings that caught on fire.²⁷⁷

Even after a pressurized water system was installed, water for firefighting continued to be a problem. In 1894, only three years after the private water company was formed, the Central Hotel filed a \$12,000 damage suit against the Artesian Hot and Cold Water Company. Mr. J. H. Bush, the hotel owner, claimed that the hotel sustained heavy fire damage in 1893 due to inadequate pressure and volume of water supplied by the water company.²⁷⁸ In February 1894, the city sought an injunction against the Artesian Hot and Cold Water Company to prevent the company from cutting off water to the fire hydrants. At the time, the city and the water company were embroiled in a legal dispute over the water rates to be paid for furnishing water to fight fires. The citizens of Boise, especially the local businessmen and the editor of *The Idaho Daily Statesman*, agreed that the city should pay the water company's requested rates for fire protection water.²⁷⁹ At the time of the dispute, the water company had requested \$2,200 per year to supply water to 55 fire hydrants. This rate had been fixed by the Water Commission on May 27, 1894 and was approximately \$875 higher than the previous year's rates.²⁸⁰ The judge ruled against the city because there was no contract between it and the company to provide such water.²⁸¹

In June 1894, a Pacific Insurance representative inspected Boise and learned of the dispute. He speculated that this could impact the fire insurance rates for Boise.²⁸² From 1860 to 1890 the ratio of premiums to loss in Idaho was 63 percent. The loss ratio increased to 79 percent in 1892, and in 1893 Idaho led the nation with a loss ratio of 114 percent. In 1893, Idaho's record for preventing fires was so poor that the fire insurance companies invoked a policy clause requiring payment of only three-fourths of any loss caused by fire. The insurance companies concluded that "Idaho was either too unlucky or too fond of flames" to be allowed to receive full reimbursement for fire claims.²⁸³ The cost of increased fire insurance to downtown businessmen, due to inadequate water for fire protection, was \$4,000 per year. Although the \$2,200 for fire protection water was a cost to the city and shared by all taxpayers, the \$4,000 for increased insurance rates would have been paid by the individual merchants. The newspaper, although in favor of the city paying the water company, noted that this was an example of class discrimination.²⁸⁴ In May 1897, the city and the water

company entered into a contract to provide water for fire protection for \$1,800 per year. In 1898, the dispute resumed when the city refused to renew the contract with the water company or to pay the company's invoice for monthly fire protection service.²⁸⁵ In response, the company threatened to discontinue maintaining a 550,000-gallon water reservoir in Hull's Gulch that was reserved for fire purposes.²⁸⁶ Although the city frequently complained that the water company provided inadequate pressure and volume for fire protection, the water company was also praised for its service. In 1899, following a fire at the Pioneer Block, *The Capital* reported "the water company did a good service and the water supply was abundant."²⁸⁷ In February 1900, fire protection was still an issue. The Boise City Council discussed the ownership of the water supply and Councilman Phelps presented the following resolution:

*"Whereas the City of Boise is at present and has been for some time without adequate fire protection in the shape of water pressure, and Whereas, the near future affords no prospect of relief in that direction at a cost within the reasonable expenditures of the city, and said condition exposes our business and residence property to serious loss. Resolved, that the mayor be instructed to appoint a committee of three members of this body whose duty it shall be to thoroughly investigate as to the feasibility of putting in a system of water works with the estimated cost of the same."*²⁸⁸

Historians frequently attribute the lack of adequate water for fire protection as a cause for municipal takeover of private water systems. However, no action was taken on Councilman Phelps' request and contrary to the experience in many other cities, Boise's water supply remained under private ownership.

Figure 37.
Early 1900s Boise Street
Drinking Fountain²⁹¹



Street Drinking Water Fountains

In the early days, most saloons in Boise served ice water to patrons on hot days.²⁸⁹ The Women's Christian Temperance Union (WCTU) promoted the practice of keeping large crocks of ice water on tables outside the saloon so that women and children did not have to enter to get a drink.²⁹⁰ After the piped water system was installed, the city erected several drinking water fountains in the downtown

Figure 38.
1910 WCTU Water Fountain
at the New City Hall
(photo by author, 2006)



area (see Figure 37). In 1900, the city council approved a design for a bronze-coated water fountain submitted by the Idaho Hardware Store.

The water fountains served the thirsty pedestrians of Boise for many years. In 1951, the Boise Water Corporation charged the city \$3.00 per month per fountain to provide water to the street fountains.²⁹² The water fountain in front of the Boise City Hall at Capitol and Idaho streets was donated to the city by the WCTU and originally stood at the old City Hall at Eighth and Idaho streets. In 1910, the WCTU paid \$150 for the fountain (see Figure 38).²⁹³

WATER RIGHTS AND WATER RATES

Several urban historians have explored the role that water rights and water rates played in municipal takeovers of private water systems. The delay in municipal ownership in the City of Oakland was attributed to the fact that the private water company owned all of the available surface water rights. At the time that Boise's privately owned water system was installed, water rights played no role in determining the ownership structure, as no right was required in Idaho to use groundwater.

Water Rights

After the 1846 treaty with Britain, water in the Oregon Territory (which included Idaho) became the property of the U.S. government. Later, water became the property of the Idaho Territory (1867) and then the State of Idaho (1890). Water in Idaho is public water and is defined as all the waters of the state when flowing in their natural channels, including the waters of all-natural springs, lakes and groundwater.

In Idaho, the system of water law is the right of Prior Appropriation, or "first come, first served." The basic principles of the Prior Appropriation Doctrine are: (1) a private right to use water can only be acquired by diverting water from a source and using it in a beneficial manner; (2) the first in time in appropriating water from the same source is the first in right; and (3) the water right is only maintained by use (typically if the water is not used for five years, the water right may be lost). Beneficial use includes, but is not limited to, mining, irrigation, domestic, municipal, commercial, recreation, hydropower, stock-watering, fish-farming, manufacturing and processing.

Many of the first water rights established in Idaho were for mining purposes and were established before Idaho was a Territory. Miners simply staked a claim to the water and filed it with the miners' committee or council. This system of allocation of water initially functioned fairly well for surface water resources. However, as demands for water increased, the available resource was inadequate to meet all appropriations. On July 3, 1905 the flow of water in the Boise River was 835 cubic feet per second, and by August 26 of that year the flow had decreased to 585 cubic feet per second. Given the total volume of water appropriated from the river, if the first fifty water right holders took all of their allocation, seventy-five other water right holders would have gone without water. The lack of water resulted in legal action and on December 1, 1905, Judge Stewart upheld the doctrine of Prior Appropriation in *Farmer's Co-Operative Ditch Company vs. The Riverside Irrigation and Others*. In his order, he reaffirmed Tom Davis's original water right (Right No. 1) and placed a priority date on the 134 other water rights for Boise River water.²⁹⁴

The water rights for the municipal water supply of the City of Boise are not held by the city, although the city does have water rights of its own, primarily groundwater used to irrigate city parks. The municipal water rights are held by Capitol Water and United Water. In addition to holding many of the original groundwater rights in Boise, United Water purchased surface water rights from canal owners and irrigators and assumed the water rights of the numerous small water systems purchased by the company.

Water Rates

Several historians have noted that disagreements over water rates resulted in municipal takeover of privately owned water systems. Although the city and the water company were frequently in conflict over water rates, Boise's anti-tax, pro-business atmosphere negated most of the city's efforts to acquire the water system.

Soon after the Eastman brothers obtained permission to lay water pipes in the alleys and streets of Boise, water rates became an issue. The Artesian Water and Land Company was formed to compete with the Eastmans' water system because the principals thought the rates charged by the Eastmans were too high. During a one-year period, when the two companies were in competition, the Eastmans' company, Boise Water Works, offered free water for a limited time. After the Eastmans developed a source of hot water, they forced a merger with the Artesian Water and Land Company, with the Eastman faction holding the majority of the stock. In April 1891, shortly after the merger, the new rates were established for domestic water (see Table 2).

*Table 2.
1891 Municipal Water Rates,
Boise, Idaho*

House with 4 rooms or less	\$1.00/month
House with 5 or 6 rooms	\$1.25/month
House with 7+ rooms	\$1.50/month
Bathtubs, extra each at	\$0.50/month
Lawn sprinkling per 50-foot lot	\$5.00/ season
Irrigation of extra lot	\$2.50/season
Private stables	\$0.50/month

In 1892 the water rates were increased for some users. In addition to the basic rates (which remained unchanged), private residences were charged \$1 per month for the first water closet and \$0.50 per month for each additional water closet. The rate for urinals was \$0.25 per month. These rates were added after the installation of the public sewer and a subsequent increase in the use of water.

Banks, stores, hotels and commercial structures were charged different rates for water closets and urinals (see Table 3).

*Table 3.
1892 Commercial Water
Rates for Urinals and
Water Closets, Boise, Idaho*

TYPE OF BUSINESS	FIRST WATER CLOSET	ADDITIONAL CLOSETS (EACH)	FIRST URINAL	ADDITIONAL URINALS (EACH)
Bank	\$1.00/month	\$0.50/month	\$0.25/month	\$0.25/month
Saloons	\$2.00/month	\$1.00/month	\$0.50/month	\$0.25/month
Hotel	\$2.00/month	\$1.00/month	\$0.50/month	\$0.25/month
Board house	\$1.00/month	\$0.50/month	—————	—————
Restaurant	\$1.00/month	\$0.50/month	—————	—————
Breweries	\$2.00/month	\$1.00/month	\$0.50/month	\$0.25/month
Corrals	\$2.00/month	\$1.00/month	\$0.50/month	\$0.25/month
Stores	\$1.00/month	\$0.50/month	\$0.25/month	\$0.25/month

In the business district, water closet and urinal rates for the second and third stories of buildings had a lower rate for the third floor, which reflected some economy in providing water to vertical structures. In addition to the charge for water closets and urinals, businesses were charged a flat monthly rate for different types of water use (see Table 4).

*Table 4.
1892 Commercial Water Rates,
Boise, Idaho*

BUSINESS	RATE	BUSINESS	RATE
Commercial stables	\$7.50	Saloons	\$8.00
Private stable, 1 to 2 horses	\$0.50	Breweries	\$7.00
Private stable, 3 to 4 horses	\$1.00	Restaurants	\$3 - \$5
Barber shop, 1 chair	\$1.00	Laundries	\$7.00
Barber shop, each add. chair	\$0.25	Bakeries	\$1.50
Barber shop, bath tub	\$1.50	Printing office	\$2.00
Stores, 25-ft. front	\$1.00	Stores 25- to 50-ft. front	\$1.50
Blacksmith, first forge	\$1.00	Butcher shops	\$2.00
Blacksmith, each add'l forge	\$0.25	Photograph gallery	\$2 - \$3
Soda fountain	\$1.00		
Soda fountain, each jet/spray	\$0.50		
Soda fountain, each washer	\$0.50		

Water rates for construction purposes included: bricks, fifteen cents per thousand; plaster, 1/3 cent per square yard; and cement and lime, ten cents per barrel. Lawn sprinkling was not included in the residential rate but was charged extra at \$15 per month for each lot of 50 x 122 feet, and fractional parts of lots at \$0.30 per foot of frontage per month.

In the 1890s, the city paid the water company \$114 per month for water for fire protection. This charge was a constant source of dispute between the city and the water company, and led to more than ten years of litigation and threats by the city to take over the water supply. In 1892, charges for water for fire protection and electricity for city street lights amounted to more than 40 percent of the city budget. The editor of *The Idaho Daily Statesman* encouraged the city to raise taxes to purchase the water system instead of "being bled through the coming years by soulless corporations that may and will fix their own prices."²⁹⁵

There are a number of variables in determining water rates. Initially, domestic water rates in Boise were established by a commission appointed by the city and the water company. After 1913, the Idaho Public Utility Commission (PUC) established water rates for domestic water provided by private companies. For comparison purposes, rates before 1909 were based on a flat rate for a six-room house with one bath tub and one water closet. The rates used in Table 5 are for 7,480 gallons of water, which represents "normal" winter household use for a modern home. The volume of water used in the 1890s is unknown, but is assumed to be significantly less than today's water use. The residents of Silver City used approximately 360 gallons of water per month per household before the piped water supply was installed.²⁹⁶ Rates and volume of water used during the summer are higher due to increased use for lawn sprinkling and were not used for comparison purposes. Rates were adjusted for inflation using the consumer price index. The rates shown in Table 5 do not include the City of Boise franchise tax of three percent or rate adjustments after 2000. The rates in Table 5 show that when adjusted for inflation, the minimum water rate for a typical house was cheaper in 2000 than in 1891.

Table 5.
Historical Water Rates for
Domestic Water, Boise, Idaho
(1891-2000)

DATE	RATE PER 7,480 GALLONS (\$)	ADJUSTED FOR INFLATION TO 2000 (\$)
2000	17.11	17.11
1998	13.56	14.15
1996	12.48	13.64
1994	14.09	16.20
1993	8.35	9.89
1990	8.35	11.18
1987	8.35	12.64
1986	8.70	13.42
1981	7.84	15.80
1980	6.04	13.81
1978	5.53	15.17
1976	5.05	15.61
1975	3.95	13.32
1971	3.78	16.19
1926	2.50	23.79
1909	1.75	32.35
1905	1.75	32.34
1891	1.75	32.34

Note: The flat rate charged in 1891 is not directly comparable to rates charged on a per-gallon basis and water use in the late 1800s and early 1900s was significantly less than currently used in modern homes.

Comparison of Boise Water Rates to Water Rates in Other Cities

The cost of domestic water varies from city to city and from season to season. Typically most water utilities charge "peak rates" during the summer when the demand for water, particularly water for lawn irrigation, increases. In Idaho, the Public Utilities Commission (PUC) regulates water rates for privately or investor-owned water utilities that provide water to the public for profit. The PUC does not set water rates for municipal or cooperative-owned water systems. There are twenty-six investor or privately owned water companies in Idaho that provide domestic water. This number does not include canal companies that provide water for landscape irrigation. There are more than 2,550 municipal or cooperative water systems in Idaho not regulated by the PUC.

Water utilities in Idaho can be divided into two groups: non-metered and metered systems. Non-metered systems charge a flat rate per month for water with no minimum or maximum consumption. The only restriction on volume is the connection pipe size. Most domestic connections are $\frac{3}{4}$ inch or less. Some flat-rate systems include a surcharge during the summer months due

to increased usage for lawn irrigation. Non-metered systems are typically discouraged as no incentive is provided for water conservation. Metered systems typically have a minimum charge that includes a minimum volume of water. All water used over the minimum volume is charged at a higher rate, usually increasing with the volume used. Because there are so many different pricing methods, it was necessary to select the rate for several different volumes in order to compare Boise's water rates with rates charged by other cities.

The rates presented in Table 6 are based on winter rates. The rates used in Table 6 were either obtained from the files of the PUC or from the water departments of the individual cities. The average rate for U.S. cities was obtained from a survey conducted in 2002.²⁹⁷ As indicated in Table 6, United Water's rates are higher than the rates charged by most municipally owned systems in Idaho, although they are typical of major U.S. cities, as captured in the average of 147 U.S. cities.

Table 6.
*Comparison of Regulated
and Non-Regulated Water
Rates in Idaho (2002)*

UTILITY	3,740 GALLONS	7,480 GALLONS	11,220 GALLONS	22,440 GALLONS
Bar S. Circle	\$15.00	\$15.00	\$15.00	\$15.00
Capitol Water	\$12.92	\$12.92	\$12.92	\$12.92
Eagle Water	\$11.75	\$11.75	\$11.75	\$11.75
Fall Water Co.	\$11.50	\$11.50	\$11.50	\$12.52
Island Park	\$10.40	\$10.40	\$10.40	\$10.40
Spirit Lake	\$12.00	\$12.00	\$14.02	\$25.44
Troy Hoffman	\$5.94	\$7.58	10.43	\$17.16
United Water	\$12.20	\$17.11	\$22.02	\$36.76
Caldwell *	\$7.05	\$10.41	\$13.65	\$23.55
Idaho Falls *	\$11.00	\$11.00	\$11.00	\$14.60
Meridian *	\$8.38	\$11.32	\$15.24	\$26.02
Nampa *	\$11.72	\$13.75	\$17.80	\$29.97
Twin Falls *	\$6.79	\$10.41	\$14.04	\$24.92
Garden City*	\$11.42	\$20.88	\$25.86	\$40.78
Average of 147 U.S. cities	\$10.83	\$17.71	\$25.05	\$47.50

*Municipal-owned systems not regulated by the PUC

Regulation of Water Rates in Idaho

In Idaho, the PUC only regulates rates charged by a private utility. Municipal-owned water systems are not regulated. The initial method of establishing water rates charged by private corporations in Idaho was contained in the following provision of Section 2711 of the 1877 Revised Statutes of Idaho:

*"All corporations formed to supply water to cities or towns must furnish pure, fresh water to the inhabitants thereof for family uses, so long as the supply permits, at reasonable rates and without distinction of person, upon proper demand thereof; and must furnish water to the extent of their means in case of fire or other great necessity, free of charge. The rates to be charged for water must be determined by commissioners to be selected as follows: Two by the city or town authorities, or when there are no city or town authorities, by the Board of Commissioners of the County, and two by the water company; and in case a majority cannot agree to the valuation, the four commissioners must choose a fifth commissioner; if they cannot agree upon a fifth, then the Probate Judge of the county must appoint such fifth person. The decision of the majority of the commissioners must determine the rates to be charged for water for one year, and until new rates are established. The Board of County Commissioners or the proper city or town authorities may prescribe proper rules relating to the delivery of water, not inconsistent with the laws of the Territory."*²⁹⁸

The City of Boise and the Artesian Hot and Cold Water Company were frequently in dispute over the pressure and volume of water available for fighting fires. However, the primary argument between the city and the water company was the fact that the water company charged the city a set amount of money each month for providing water to fire hydrants. The city argued this was in conflict with the above Section 2711 of the Revised Statutes of Idaho which stated that water for fighting fires was to be provided "free of charge." This issue was initially resolved in July 1895 when the Idaho Supreme Court ruled in Boise's favor. The water company agreed the water was free, but insisted they could charge the city for the cost of the pipelines and pumps necessary to supply sufficient pressure to fight a fire.

On March 9, 1905, the Idaho Legislature amended Section 2711 of the Idaho Statutes to allow water corporations to charge municipalities for water for fire protection. House Bill 168 was introduced by Orin V. Allen from Ada County. The Bill passed on the third reading with a vote of 44 ayes and one nay. The single nay vote was by Harvey B. Powers, also of Ada County.²⁹⁹ The new legislation required that water rates were to be set by a commission selected by the water company and the municipal government. The commission established a rate of \$300 per month for the City of Boise. On May 31, 1906, the city retaliated and passed Ordinance No. 678, charging the water company \$300 per month for the use of city streets and alleys to run water lines. This ordinance conflicted with ordinances 94 and 100 that gave the water company permission to lay water pipes in the streets but did not include a fee to be paid to the city. Over the next

few years several additional lawsuits were filed either by the city or the water company. Ultimately all of the legal actions were combined and argued before the United States Supreme Court on May 7 and 8, 1913. The court ruled that both Ordinance No. 94 and Ordinance No. 100 were valid and that Ordinance No. 678 was "illegal and void and amounted to impairment to those rights in violation of the contract clause of the Federal Constitution."³⁰⁰ The ruling effectively ended almost twenty years of legal arguments between the city and the water company.

SUMMARY AND CONCLUSIONS

In contrast to the national experience, the water supply for the City of Boise has been privately owned since 1890. Historians attributed the Progressive Era water municipalization trend to a number of factors including: the failure of private water systems to provide adequate water for fighting fires; disputes over water rates; failure to supply water to poor areas of the city; and high disease rates attributed to poor-quality water. Although all of these factors occurred in Boise and the city has at various times considered municipal ownership, the citizens have voted down the taxes necessary to purchase the water supply or the city implemented no action to take over the water system. The longevity of Boise's privately owned water system is due to a combination of factors including: Boiseans' anti-tax, libertarian, pro-business attitude and the conservative legislative requirements of municipal funding.

In 2006, two private water companies (United Water Idaho and Capitol Water Corporation) supplied domestic water to the citizens of Boise. Capitol Water, the smaller of the two systems, served approximately 2,700 customers with groundwater from seven water wells. United Water supplied water to the rest of the city and many customers outside the city limits. Groundwater from approximately 90 water wells provided approximately 83 percent of the water to United Water's customers. The remaining 17 percent was supplied from three infiltration wells and two direct intakes from the Boise River. United Water and Capitol Water both paid an annual franchise fee (three percent of revenue) to the city and both paid city property taxes. According to their most recent filing with the PUC, United Water and Capitol Water paid \$1,403,452 and \$29,125 respectively in property taxes in 2005. In some areas of the city, private canal companies provided landscape irrigation water. In addition, there were numerous private water supply wells in the city used for industrial, domestic and irrigation purposes. The city also operated a number of water wells used to irrigate municipal parks.

In 2006, the City of Boise again considered the benefits of municipal ownership of the water supply system. The 1892 issue of "being bled by soulless corporations that may and will fix their own prices" was solved in 1913 by the creation of the Idaho Public Utilities Commission and a recent survey of domestic water rates suggest Boise's water rates are typical for the United States. However, there may be other benefits to a publicly owned water system. The city has the power through eminent domain to purchase the water system for a fair market value; however, the ownership issue concerns more than just price. Today the circumstances are significantly different than those that existed in the late 1800s and early 1900s. United Water's service area extends beyond the Boise city limits. Due to system

interconnections and redundancy, the water system, including wells, pumps, storage reservoirs, treatment systems, and pipelines, cannot easily be separated into those components that serve Boise and those that serve outlying areas. In addition, it would be difficult for Boise to separate the water rights for those living outside the city and purchase only those sufficient to supply the city. The city would lose the income from the franchise tax and the property taxes paid by the water companies. The most serious obstacle to public ownership may be convincing the citizens to pass bonds to purchase the system. As evidenced by the defeat of bonds for a library expansion in 2006, Boise residents have not significantly changed their opinion on taxes or bond obligations since the founding of the city. Bonds for the water system would be revenue bonds that only require approval by a simple majority of voters, not the two-thirds majority required for non-revenue bonds. Water is a highly regulated commodity and it is unlikely that Boise would improve the service or quality if the city purchased the water systems. There are no significant complaints concerning service or water quality pending with the Public Utilities Commission.³⁰¹

Boise has three options concerning ownership of the water supply: do nothing and let the system remain under private ownership; purchase the water system as a city-owned utility; or, join with other government jurisdictions and form a water district to purchase the system. A number of issues should be taken under consideration before any decision is made to purchase the water system. First and foremost, the choice of ownership should be based upon which option can provide the best service for the lowest price. It is doubtful if Boiseans would support a bond issue if water rates were raised to pay for the bonds. If a financial analysis demonstrates that the same or lower rates can be maintained and at the same time account for the loss of property taxes and franchise fees, then there should be no disadvantage to city or water district ownership. Historically, Boise has provided limited municipal services, relying instead on participation with regional service providers or private enterprise. Given the fact that United Water's distribution system extends outside the Boise city limits, a regional water system may be more advantageous than a municipal-owned system. The major disadvantage of municipal or regional ownership is that water rates and service areas will no longer be regulated by the Public Utility Commission and political considerations concerning rates and service areas will be tempting to elected officials. The major advantage of municipal ownership is that Boise could charge connection or impact fees, placing some of the cost of growth on new homeowners, instead of existing ratepayers.

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APPENDIX A

CHRONOLOGY OF THE CITY OF BOISE WATER SUPPLY

From 1863 through 1890, domestic and public water was supplied by individual wells, springs and irrigation ditches. Several public wells existed in the main downtown area and cisterns were constructed near irrigation ditches to hold water for fire-fighting. In 1881 the first piped water system in the City was installed by H. B. and B. M. Eastman at the Overland Hotel, which was located at the northwest corner of Eighth and Main streets. Water was obtained from a spring in Hull's Gulch, stored in a nearby reservoir, and then piped to the hotel down Eighth Street. The Eastman brothers also supplied water to a city cistern used to store water for fighting fires, to Mr. C. W. Moore's mansion located on Grove Street, and several other residences and businesses along the pipeline route. In 1889, the Eastman brothers proposed to supply water to the city for domestic and fire-fighting purposes and on October 3, the city passed Ordinance No. 94 granting the Eastman brothers the right to lay water pipes in city streets. The Artesian Water and Land Company was formed in 1890 to compete with the Eastmans' company and on July 10, 1890, Ordinance No. 100 was passed by the City Council giving permission to the second company to install water pipes in city streets. In 1891 the two companies merged to form the Artesian Hot and Cold Water Company Limited. The company has undergone several name changes and for many years was known as the Boise Water Company. The current municipal water purveyor, United Water Idaho, is the successor to these private water companies. As the city expanded in the mid 1900s, many small water supply companies were purchased by Boise Water Company. Today, domestic water is supplied to the city by two companies: United Water Idaho and Capitol Water Company. Several canal companies also provide lawn irrigation water to residential customers. Numerous private wells still exist in the city and the city owns several wells used for park irrigation. The following chronology notes important dates and events in the history of Boise's water supply.

- 1863** The Vallisco Water Supply applied to the legislature for a charter and commenced work on two ditches to supply water to the Boise Valley. One ditch was to carry 5,000 inches of water from near Beaver Dick's ranch on the northeast side of the Boise River and would furnish water for agriculture, mining, mechanical and "city purposes." The ditch was designed to furnish 35 feet of head above downtown Main Street. The other ditch would run between Fort Boise and Boise City. The company did not open subscriptions for stock until February 1865. Work on the ditches started in May 1865 and was completed

in 1866. William B. Hughes was elected president of the company. The ditch was later purchased by R. Z. Johnson and J. B. Walling. In later years, the ditch was also known as the Walling Ditch, the Perrault Ditch, the Cruzen Ditch and the Goodwin Ditch.

- 1869** A large cistern was constructed in front of the Overland Hotel to supply water for fighting fires.
- 1870** There was a town water well and pump on the corner of Eighth and Main. In October, Frank Coffin drove a perforated well pipe in the county courthouse yard and installed a pump.
- 1871** In July, a boring crew began drilling a well in the public square near the statue of George Washington (site of current capitol building). At first the drillers used a horse-powered treadmill but later switched to steam power. The boring encountered difficulties and was abandoned. Frank Davis started a second well but it was also abandoned.
- 1875** A municipal water system was the subject of discussion and the newspaper recommended looking at the possibility of using artesian wells as a source of water for the city.
- 1876** In the 1870s numerous water ditches in the city were used to provide irrigation water for fruit and vegetable gardens. After the water was diverted from the ditches, there was no drainage system to remove excess water. This resulted in frequent flooding and the creation of mud holes in the streets. In 1879, the city passed Ordinance No. 41 requiring individuals diverting irrigation water to construct drainage ditches and culverts under streets. However these bridges or culverts were often too small and the newspaper advocated using a road tax to build and maintain the street crossings.
- 1879** A water supply for the city was again discussed and the newspaper advocated using a spring in Hull's Gulch to supply water to the city. The spring was reported to flow 100 gallons per minute (gpm) and could be used to fill a reservoir and distribute water through galvanized pipes. The cost was estimated to be less than \$10,000. This system was never installed. In 1879, water for fighting fires was stored in cisterns located at all major intersections

on Grove and Idaho Streets. The cisterns were filled from the Grove Street ditch.

1881 H.B. and B.M. Eastman installed a water system for the Overland Hotel which they had purchased in 1877. This was the first piped water system in Boise. Water was piped from a spring in Hull's Gulch to a nearby reservoir and then through galvanized pipes down Eighth Street to the hotel. The water pressure was sufficient to shoot a stream of water horizontally 70 feet or to spray water over the roof of the hotel. The Eastman brothers also supplied water to Mr. C. W. Moore's residence on Grove Street, water to fill a city cistern located at the intersection of Eight and Idaho streets and to other residences and businesses along Eighth Street. The population of Boise at this time was approximately 2,000.

1882 The newspaper advocated that the Eastman Brothers add a second reservoir and supply water to the city for domestic purposes; however, this did not occur for several years.

The Boise City Water Company Articles of Incorporation were filed with the Territorial Secretary. The trustees were: Dr. John L. Stephens, James H. Bush, David P. B. Pride and Joseph S. Morgan. Apparently the company never installed a water supply system.

1886 The City of Boise discussed installing a municipal-owned water supply system. Options included using water from the Boise River above town, a ditch from Cottonwood Creek or artesian wells. However, Cottonwood Creek would not supply water year-round and artesian wells were not proven in the area, although they were considered the cheapest solution. The system was estimated to cost \$25,000 to \$50,000. The Idaho Territorial capital was completed in 1886 and water to the building was supplied by the Eastman brothers.

1887 In June 1877, the Idaho Territorial Legislature passed Statute 2711 which established methods to regulate the setting of rates that private water supply corporations could charge for water. One clause of the statute required corporations to provide water free of charge to fight fires and other emergencies. This clause later became the source of ten years of litigation between the

water company and the City of Boise. In March 1887 the City of Boise passed Ordinance No. 83, contracting with Frank Davis to provide fire protection for the city. He proposed to drill a 500-foot-deep artesian well in Cottonwood Creek, provided the city or subscribers would provide the casing. Apparently this venture failed.

- 1888** Water for fighting fires was available from the irrigation ditch on Grove Street and from two public wells located at the intersection of Sixth and Idaho, and Eighth and Idaho. Four water storage tanks were located on the Grove Street Ditch and could be used to fight fires. The only piped water supply was provided by the limited system the Eastman brothers installed in 1881. The Eastmans' reservoir near the springs in Hull's Gulch was constructed of brick and had a capacity of approximately 35,000 gallons.
- 1889** On October 3, 1889, the City of Boise passed Ordinance No. 94 which granted a franchise to the Eastman brothers to lay pipes in the city streets and supply domestic water to the city.
- 1890** The Eastmans drilled three artesian wells in Hull's Gulch near the spring used to supply the Overland hotel. The wells were approximately 20 feet deep and flowed at 800,000 gallons per day. The Eastmans proposed to serve the city water at a rate of \$3.00 per faucet per month. Another merchant, Nathan Faulk, considered the price too high and formed a competing company with Frank Coffin, Tom Davis and John Lemp. On June 2, 1890 they incorporated the Artesian Water and Land Company. On July 10, the city passed Ordinance No. 100 giving the Artesian Water and Land Company permission to lay water pipes in the city streets. On June 23, H. B. Eastman, T. Regan, Peter Sonna, C. W. Moore, Alfred Eoff and W. H. Ridenbaugh incorporated the Boise Water Works Company. Soon afterward, the Artesian Water and Land Company completed its artesian wells in Hull's Gulch and there were two water supply systems competing to supply water to the city. Both companies constructed pipelines at the same time and arguments between the two were frequent. The companies often left trenches open overnight and in some places the streets subsided due to lack of fill dirt covering the pipes. Both companies were awarded fire contracts by

the city. The city purchased the fire hydrants and Boise Water Works Company was paid \$8 each for installing thirty hydrants and the Artesian Water and Land Company was paid \$25 each for installing twenty hydrants. The population of Boise at this time was approximately 4,000.

1890 In 1890, John Grumbling, a water well driller, approached the Boise Water Works Company with the idea of drilling an artesian hot water well near the Penitentiary. It was well known that there was an area near the Penitentiary where the ground was warm and snow did not accumulate. The Water Company purchased ten acres from Robert Wilson and began exploration for hot water.

1891 By March 1891, while the two companies battled to provide water to the city, the Boise Water Works Company had completed two hot water wells about 300 yards west of the state penitentiary. In April 1891 a contract was awarded to the Puget Sound Pipe Company for the construction of a reservoir near the hot water wells. In May of that year, the wells were flowing approximately 1 million gallons of water per day at a temperature of 180 degrees F. The primary use proposed for the hot water was for a hot water bath resort.

On March 27, 1891, the Boise Water Works Company and the Artesian Water and Land Improvement Company consolidated into a new company, the Artesian Hot and Cold Water Company Limited. The directors, drawn from the original stockholders of both companies, were:

H.B. Eastman	Peter Sonna
C. W. Moore	Nathan Falk
T. Regan	W. Northrop
W.H. Ridenbaugh	Thomas Davis
Alfred Eoff	J.R. Delamar
John Lemp	

The officers for the company were: President C. W. Moore, Secretary Charles A. Clark, and Treasurer Alfred Eoff. Clark resigned two weeks later and was replaced by E. B. Tague. The executive committee of the new company was made up of: H.B Eastman, chairman; T Regan, W. H. Ridenbaugh, Nathan Falk, and Thomas Davis.

In April 1891, the water rates for the new company were set as:

House with four rooms or less	\$1/month
House with 5 or 6 rooms	\$1.25/month
House with 7 + rooms	\$1.50/month
Bathtubs, extra each at	\$0.50/month
Lawn sprinkling per 50-foot lot	\$5.00/ season
Irrigation of extra lot	\$2.50/season
Private stables	\$0.50/month

1892 The Boise Natatorium was designed by John C. Paulsen, who designed the Broadwater Natatorium in Helena, Montana. The "Nat" opened on May 25, 1892. It was supplied with hot water from the new hot water wells near the Penitentiary. Water was piped down Warm Springs Road to the Natatorium via a wooden pipeline. The Natatorium was a 15,000 square foot, three-story building which contained a 65-by-125-foot hot water swimming pool. The Nat offered hot tubs, steam tubs, Turkish baths and had smoking and reading rooms. The pool could be drained and covered with a wooden floor for major dances. The supply of water from the wells was in excess of the Natatorium's needs and the company explored the possibility of providing residential hot water. Two of the company officers, C. W. Moore and H. B. Eastman successfully used the water to heat their homes on Warm Springs Avenue. Soon, other residents signed up for hot water at a rate of \$2 per month for a small house and \$3 per month for a large house and Boise became the first city in the United States to use geothermal water to heat private homes. This original hot water system still exists today and is known as the Boise Warm Springs Water District.

1892 The water company proposed to drill a new water supply well on Fort Boise property and requested Senator George Shoup to assist them in obtaining permission from the War Department. The company was providing domestic water to the fort and proposed reducing the rate for water for the drilling concession. The War Department declined the proposal.

1892 The City issued sewer bonds and two main sewer lines were installed which discharged to the Boise River.

1893 In 1893, the water supply system consisted of six artesian wells in Hull's Gulch with a capacity of 1,500,000 gallons per day. Two reservoirs were located near the

wells at an elevation of 162 feet above Main Street. The capacity of the reservoirs was 10,000 and 550,000 gallons. They were not connected together but discharged into the same 10-inch diameter water main. There were sixteen miles of iron pipe in the city. The population of the city was approximately 5,500.

1894 The City of Boise passed Ordinance 152 which granted Peter Sonna the right to sell water to the inhabitants of Boise City and to lay water pipes in the streets. The source of water for the Sonna Water Works was several springs located near the head of Five Mile Gulch, above the Boise Barracks. Water was conveyed down the mountain through a two-inch pipe to a reservoir located above the officers' quarters. The water was used by the military for fire protection. Water from the reservoir was also piped into Boise where it was used in the Sonna Block for the operation of a passenger elevator, for drinking and for flushing toilets in the building. There were several fire hydrants on the mail line from the reservoir to the office building and several residents also obtained water from the system. It is interesting to note that Peter Sonna was the mayor of the city when Ordinance 152 was passed. He was also one of the original stockholders in the Artesian Hot and Cold Water Company.

1895 During the late 1890s and early 1900s, the city and the private water supply company were in constant dispute over the service, especially the pressure and volume available for firefighting. One aspect of the dispute revolved around the following provision of Section 2711 of the 1877 Revised Statutes of Idaho.

"All corporations formed to supply water to cities or towns must furnish pure, fresh water to the inhabitants thereof for family uses, so long as the supply permits, at reasonable rates and without distinction of person, upon proper demand thereof; and must furnish water to the extent of their means in case of fire or other great necessity, free of charge. The rates to be charged for water must be determined by commissioners to be selected as follows: Two by the city or town authorities, or when there are no city or town authorities, by the Board of Commissioners of the County, and two by the water company; and in case a majority cannot agree to the valuation, the four commissioners must choose a fifth commissioner; if they cannot agree upon a fifth, then

the Probate Judge of the county must appoint such fifth person. The decision of the majority of the commissioners must determine the rates to be charged for water for one year, and until new rates are established. The Board of County Commissioners or the proper city or town authorities may prescribe proper rules relating to the delivery of water, not inconsistent with the laws of the Territory."

The primary argument between the city and the water company was the fact that the water company charged the city a set amount each month for fire water. This issue was initially resolved in July 1895 when the Idaho Supreme Court ruled in Boise's favor. The water company agreed the water was free but insisted they could charge the city for the cost of the pipelines and pumps necessary to supply sufficient pressure to fight a fire.

1895 Flow from the artesian wells in Hulls Gulch was insufficient to supply the growing needs of the city, and two large diameter shallow wells and infiltration galleries were dug near the Natatorium.

1900 As the dispute with the water company continued, the City Council considered construction of a new municipal system. City Councilman Phelps wrote to several cities to inquire about the cost of such a system. In December, Phelps presented a report to the City Council containing the results of a survey of fifty cities queried on municipal ownership. Of the thirty responses to Phelps' letter, twenty-four were in favor of municipal ownership of water supply systems

The city estimated a new gravity water system would cost \$400,000 and a pumping system \$200,000. State law would only allow the city to issue bonds for 15 percent of the assessed valuation of taxable property in the city, which at the time was approximately \$3 million. Given the existing bonding of \$225,000, the city only had \$225,000 for new bonding capacity, a sum insufficient for a construction of the preferred gravity system. The city's assessed valuation was made using only 60 percent of market value and the city could have raised the valuation to meet new bonding needs. In 1901, the newspaper encouraged the city to put the proposition before the people.

1900 On May 9, the City council passed Ordinance 310 Grant-

ing Charles Fifer the right to construct and operate a public water supply for the city; however the system was never constructed.

1900 On September 1, the Artesian Hot and Cold Water Company, incorporated in the State of West Virginia as the Boise Artesian Hot and Cold Water Company, Ltd. The purpose of the incorporation in West Virginia was to gain an advantage in the ongoing legal issues with the city concerning the rates charged for water for fighting fires. As an out-of-state corporation, the case could be decided in a federal versus a state court.

1902 The water company, still in a dispute with the city over Section 2711 of the 1877 Revised statutes of Idaho, hired an attorney to contest the validity of the Statute. At issue was not only the cost of water for fighting fires but if Boise could change Ordinance No. 94 which granted the water company the right to lay water pipes in the city. In a May 29, 1903 verdict the United States Court of Appeals for the Ninth Circuit rendered the following decision as related to City Ordinance No. 94.

"No term was fixed for the duration of the privilege, and no contract was in terms made between the city and the grantees of the privilege. It is plain that the ordinance was either the grant of a license revocable at the will of the grantee, or, by its acceptance on the part of the grantee, it became an irrevocable and perpetual contract. No middle ground is tenable between these two constructions. In the constitutions of nearly all the states it is provided that no exclusive or perpetual franchises shall be granted, and irrespective of such constitutional limitation, it is clear, both upon reason and authority, that no municipal corporation, in the absence of express legislative authority, has power to grant a perpetual franchise for the use of its streets."

1903 In 1903, the Boise Artesian Hot and Cold Water Company Ltd. had thirteen flowing artesian wells with a capacity of 300,000 gallons per day. Water from the wells in Hull's Gulch was collected in two stone and cement reservoirs of 550,000 gallons and 220,000 gallons. In addition, the company had two wells located near the Natatorium. One was 25 feet in diameter and 17 feet deep and the other 16 feet in diameter and 20 feet deep. Water from the wells were pumped by two Worthington

compound duplex steam pumps to a 550,000-gallon stone and cement reservoir located approximately 2.5 miles southeast of the city near the Penitentiary. The reservoir near the Penitentiary could also be filled by gravity from the reservoirs located in Hull's Gulch. The population of the city was approximately 11,500.

1904 The city contemplated purchasing the water system and retained Samuel M. Gray, a consulting engineer to review the water system and determine a fair value. At that time, the water system consisted of eight artesian wells in Hull's Gulch and two shallow wells near the Natatorium. Water was stored in two reservoirs in Hull's Gulch and another reservoir near the Penitentiary. During peak demand in August, the system supplied approximately 3 million gallons of water per day. Ten percent of the supply was from the artesian wells and 90 percent was from the shallow wells near the Natatorium. There was approximately 31 miles of pipeline in the city. Mr. Gray estimated the value of the water supply system to be \$208,000.

1905 On March 9, the Idaho Legislature amended Section 2711 of the Idaho Statutes to allow water corporations to charge municipalities for water for fighting fires. House Bill 168 was introduced by Orin V. Allen from Ada County. The Bill passed on the third reading with a vote of 44 ayes and one nay. The single nay vote was by Harvey B. Powers, also of Ada County. The rates were to be set by a commission selected by the water company and the municipal government. The rates established by the commission for the City of Boise were \$300 per month. On May 31, 1906, the City retaliated and passed Ordinance No. 678 charging the water company \$300 per month for the use of city streets and alleys to run water lines. Over the next few years there was several additional lawsuits filed either by the city or the water company. Ultimately all of the legal actions were combined and argued before the Supreme Court on May 7 and 8, 1913. The court ruled that both Ordinance No. 94 and the Ordinance of July 19th, 1890 (Ordinance No. 100) were valid and that Ordinance No. 678 was *"illegal and void and amounted to impairment to those rights in violation of the contract clause of the Federal Constitution."*

1907 The Capital Water Company was formed. The gravity

system was supplied with water from the Boise River via the Cruzen Ditch. The company supplied water for fire protection to the central business district and to the city to sprinkle the streets.

- 1912** The city was supplied with water from two separate systems. The Boise Artesian Hot and Cold Water Company had both gravity and direct pressure systems. The direct pressure system was supplied from an intake well thirty feet in diameter and twenty feet deep near the river and supplied by underflow from the river. Two pumps were capable of pumping 1,500,000 gallons from this well. In addition, a steam-powered pumping system of two Worthington compound duplex steam pumps with 1,500,000 gallons per day capacity each were available to use in the two wells near the Natatorium. The city had four water storage reservoirs. The No. 1 reservoir was a brick and cement lined excavated reservoir located about 2.5 miles north of the city with a capacity of 550,000 gallons. It was supplied by artesian wells with a flow of 220,000 gallons per day. The second reservoir was a brick and cement lined excavated reservoir located approximately a half mile south of the first reservoir. This reservoir was supplied by artesian wells with a flow of 190,000 gallons per day. The third reservoir was located 2.5 miles east of town near the Penitentiary and was supplied by a pumping plant and water well near the river. A fourth reservoir was under construction and was located approximately 250 feet northeast of the No. 2 reservoir. When completed it would have a capacity of 5 million gallons. The system consisted of approximately fifty miles of pipeline, of which approximately sixteen miles were wooden. The population of the city was approximately 17,358.

The second water supply system or Capital Water Co. (Cruzen system) was a gravity-only system and consisted of approximately fifteen miles of mains and seven fire cisterns with a capacity of 4,000 each and one 7,200-gallon cistern in the downtown business section.

- 1913** The Public Utilities Commission was formed to regulate domestic water supply rates and the Hot and Cold Water Company was separated into two separate water companies, one to supply domestic water, the other to supply hot water. The stockholders were the same for

both companies.

- 1915** On December 11, the Boise Artesian Hot and Cold Water Company, which had been incorporated in West Virginia, reincorporated in Idaho with no change in name.
- 1917** A graduate student at the State College of Washington completed a master's thesis on the water system to determine if the source of water in the shallow wells near the Natatorium was from the Boise River or from groundwater originating in the hills north and east of Boise. He concluded that the wells obtained water from both sources.
- 1920** On April 18, the water company repurchased the Natatorium. On October 1, the Boise Artesian Hot and Cold Water Company changed its name to the Boise Artesian Water Company and sold the Natatorium Company the hot water portion of the company. The Natatorium and the hot water system were not considered public utilities and were kept as separate legal entities. However, the stock of the Natatorium Company was entirely held by the stock holders of the Boise Artesian Water Company. The sale of the company was specifically to avoid regulation of the hot water rates by the Public Utilities Commission.
- 1921** In 1921, a typhoid outbreak occurred in the city. Between January 21 and February 4, 26 cases of typhoid were reported in Boise, of which seven deaths occurred. In December of the previous year, bacteriological samples taken from the wells near the Natatorium showed evidence of contamination but no action was taken because bacteria was not found in the distribution system. On January 4, 1921, a "*Boil the Water*" notice was placed in the local newspaper and on January 11 temporary chlorine equipment was installed on the system. The temporary equipment was replaced in March 1921 with a solution feed liquid chlorinator. A gas chlorinator was installed in 1925. The population of the city was approximately 21,393.
- 1923** The Boise Artesian Water Company conducted a study to determine the volume of unaccounted water (typically water lost to leakage from pipes). Approximately 28 percent of the water produced was lost in the distribution system. This was comparable to lost water volume

in 39 other city water systems.

- 1927** In January, control of the Boise Artesian Water Company was sold to W. B. Regan. In December, the controlling interest was sold to Paul C. Dodge and Company of Chicago.
- 1928** On April 2, the Boise Artesian Water Company was reorganized as the Boise Water Corporation, and in July became affiliated with General Water Works Corporation.
- 1934** The Natatorium was closed due to damages sustained to the wooden structure over several years. The "Nat's" demise was final when part of the roof collapsed in a high wind.
- 1938** The Boise Water Corporation was issued a thirty year franchise to supply water in the City of Boise. The franchise required a 3 percent tax paid to the city on gross revenues.
- 1941** The Boise Water Corporation was using both gravity and pressure systems. A pumping plant was located near the Boise River and an 800-gallon-per-minute 12-inch diameter well approximately 350 feet deep was installed 300 feet north of the pumping plant. Although the well was listed as artesian, it was equipped with a pump. The No. 1 reservoir (550,000-gallon capacity) was supplied from one 12-inch diameter 200-foot-deep well equipped with a 900 gpm pump. The No. 2 reservoir was filled by flowing artesian wells in Hull's Gulch at a rate of 190,000 gallons per day. The No. 3 reservoir was no longer in use and the No. 4 reservoir (5 million-gallon capacity) was connected to the circulation system. The system consisted of approximately sixty-eight miles of pipeline, some made of wood. The population of Boise was approximately 26,100.
- 1946** Boise Water Corporation was purchased by General Water Works of Pine Bluff, Arkansas.
- 1951** The Boise Water Corporation investigated the potential health problems associated with the natural fluoride in the water system.

- 1955** The PUC issued Willow Lane Water Company a Certificate of Convenience to provide water to a subdivision adjacent to the southwest boundary of the City of Boise.
- 1959** On April 6, the Willow Lane Water Corporation was re-organized as the Capitol Securities Water Corporation. Over the next several years, the company acquired adjacent small water systems that provided water to subdivisions outside the city. Eventually the areas served by Willow Lane were annexed into Boise.
- 1964** The Capitol Securities Water Corporation was issued a 25-year franchise. The system had no storage reservoirs and three deep water wells. At that time the company had 750 to 800 customers.
- 1967** International Utilities Company purchased General Water Works, the parent company of Boise Water Corporation.
- 1968** In 1968 the city formed the Boise Water Resource Committee to investigate the concept of municipal ownership of the water system and retained the engineering firm of Cornell, Howland, Hayes and Merrifield to evaluate the water system requirements for the Boise Metropolitan Area. On the issue of public versus private ownership, the consulting company concluded: "The type of ownership should be chosen that will give the best service for the least cost." In June 1968, the city issued Ordinance No. 2918 which granted a ten-year service extension to Boise Water Corporation.
- 1969** In January the city retained Stevens, Thompson & Runyan, Inc. to prepare an appraisal of the Boise Water Corporation and the Capitol Securities Water Corporation. The report concluded that the value of the systems was between 5.8 and 9.7 million dollars. The population of Boise had grown to approximately 75,000.
- 1975** A citizen committee was formed and the city hired a consultant to determine if it should purchase the water system. The report concluded no savings could be made by purchasing the system.

1977 The water system was evaluated by the Boise Center for Urban Research. The report concluded that the system did not have excessive problems and that "water delivery was efficiently and effectively carried out." The report listed 216 water wells in the Boise area, thirty-two of them owned by Boise Water Corporation.

In 1977, the State of Idaho converted the State Health Laboratory near the Penitentiary to geothermal heating and realized a significant reduction in heating costs.

1978 The franchise to Boise Water Corporation was renewed for fifteen years.

1981 Two geothermal wells were drilled near the Capitol building and by 1982, nine state buildings in the capitol complex were being heated by geothermal water. A private company, Boise Geothermal, drilled four wells and in 1983 began to supply hot water to downtown buildings.

1983 Two geothermal heating wells were drilled by the Veteran's Administration and additional hot water wells were drilled in 1986.

1987 The remaining 800 feet of wooden water pipes in the city were removed and replaced with PVC pipes.

1988 In 1988 the City of Boise purchased Boise Geothermal, a private company established to provide hot water to the downtown area.

1991 On July 15, Capitol Water Securities changed its name to Capitol Water Corporation and the City of Boise extended their franchise to 2015.

1994 The Boise Water Corporation became affiliated with United Water Resources when the General Water Works Corporation and United Water Resources merged. At that time, approximately 30 percent of United Water Resources stock was owned by Suez Lyonnaise des Eaux, a French company. The water treatment plant was also constructed to treat water from the river and from the shallow infiltration wells along the river bank. Approximately 20 percent of the water supply is obtained from the shallow infiltration wells or the river. The city

- population exceeded 125,000.
- 1995** Boise Water Corporation changed its name to United Water Idaho and the water supply franchise was extended to 2015.
- 2000** Suez acquired the outstanding stock of United Water Resources for \$1.02 billion.
- 2004** Domestic water was supplied by two private water supply companies, United Water of Idaho and Capitol Water Company. Capitol Water is the smaller of the two systems and serves approximately 2,700 customers with groundwater from seven water wells. United Water supplies water to the City of Boise and some customers outside the city limits. Groundwater from about ninety water wells provides approximately 80 percent of the water. The remaining 20 percent is supplied from two infiltration wells adjacent to the Boise River and one direct intake from the river. In some areas of the city, lawn irrigation water is provided by private canal companies. In addition there are numerous private water supply wells in the city used for industrial, domestic and irrigation purposes. The city also owns several water wells used to irrigate municipal parks. There are four separate geothermal systems in Boise. The Boise Warm Spring Water District (successor of the original hot water company), the City of Boise Geothermal System, the Veterans' Complex and the State Capitol/Mall Complex. In addition there are approximately 150 private geothermal wells in the city. In 2004 the population of Boise exceeded 185,000.

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²⁰⁹In 1857, Dr. William Budd presented a paper to the medical profession in London entitled "Rules for Preventing the Spread of Typhoid Fever." In the paper, Dr. Budd stated that "the poison by which this fever spreads is almost entirely contained in the discharges from the bowels" and "from the privy or drain the poison often soaks into the well and infects the drinking water." See William Budd, *Typhoid Fever, Its Nature, Mode of Spreading, and Prevention* (reprint) (New York: Arno Press, 1977), 176.

²¹⁰In the mid 1800s, San Francisco was the major cultural center nearest Boise and was a source of information on medical practices. Although the miasma theory of disease was prevalent in San Francisco in the late 1860s, by the early 1870s the germ theory of disease was the accepted theory. See Susan Craddock, *City of Plagues: Disease, Poverty and Deviance in San Francisco* (Minneapolis: University of Minnesota Press, 2000).

²¹¹*The Owyhee Avalanche*, July 13, 1872.

²¹²*Idaho Daily Statesman*, March 2, 1892.

²¹³*Idaho Daily Statesman*, February 4, 1900.

²¹⁴*Idaho Daily Statesman*, December 2, 1905.

²¹⁵*Idaho Daily Statesman*, December 2, 1905.

²¹⁶*Idaho Daily Statesman*, December 22, 1905.

²¹⁷*Idaho Daily Statesman*, December 14, 1905.

²¹⁸See William B. Hamilton, A Social Survey of Austin, Bulletin of the University of Texas, No. 273 (Austin: The University of Texas, 1913), 1. Also see Martin V. Melosi, *The Sanitary City, Urban Infrastructure in America from Colonial Times to the Present* (Baltimore: The John Hopkins University Press, 2000), 73-89.

²¹⁹C.N. Harrub, "Report of Investigation of the Boise City Water Supply", U.S. Public Health Service, March 1921. Idaho State Archives, Manuscript Collection MS-395.

²²⁰*Idaho Statesman*, January 5, 1921. Also see C. N. Harrub, 1921, p 3.

²²¹*Idaho Statesman*, January 5, 1921.

²²²In 1927, information concerning the news of a New Orleans flood was suppressed by the New Orleans Time-Picayune because of the fear that country merchants would not come to New Orleans to purchase merchandise. See Gay M. Gomez, "Perspective, Power, and Priorities, New Orleans and the Mississippi River Flood of 1927," in *Transforming New Orleans and its Environs*, ed. Craig E. Colten (University of Pittsburg Press, 2000), 111.

²²³*Idaho Statesman*, January 9, 1921.

²²⁴See "Legal Obligations to Furnish Pure Water, *The American City*," May (1915): 386. Also see John Wilson, "Legal Responsibility for a Pure Water-Supply," *The American City*, Vol. xxi, No. 3 (1919): 235-237.

²²⁵For a discussion of chlorination and typhoid see "Public Health Improvements Following the Disinfection of Water Supplies." *The American City*, May 1915, page 385.

²²⁶*Idaho Statesman*, January 9, 1921.

²²⁷C. N. Harrub, "Report of Investigation of the Boise City Water Supply," U.S. Public Health Service, 1921.

²²⁸*Idaho Statesman*, March 26, 1921.

²²⁹*Idaho Statesman*, March 26, 1921.

²³⁰See C.N. Harrub, 1921, p 11.

²³¹W.V. Leonard and Isador W. Medelsohn, "Investigation of the Public Water Supplies of Boise, Ada County, Idaho," November 5-7, 1925. (Combined report of the Idaho State Department of Public Welfare and the US Public Health Service), Idaho State Archives Manuscript collection MS 395, Box 39.

²³²For a discussion of U.S. typhoid statistics, see the U.S. Bureau of the Census, Mortality Statistics, 1900-1932. Idaho statistics were calculated from raw data provided to the author by the Idaho Department of Health and Welfare.

²³³U.S. Geological Survey, "Ground-Water Quality in Northern Ada County, Lower Boise River Basin, Idaho 1985-96," USGS Fact Sheet FS-054-98, June 1998.

²³⁴*Idaho Statesman*, undated article in Idaho State Historical Society vertical files on water supply.

²³⁵*Idaho Statesman*, September 6, 1971.

²³⁶Tressa Nicholas, Idaho Regional Department of Environmental Quality, Interview September 25, 2006.

²³⁷*Idaho Tri-Weekly Statesman*, May 9, 1882.

²³⁸Boise City Council Minutes, May 25, 1891, City Archives.

²³⁹*Idaho Statesman*, January 6, 1892.

²⁴⁰City of Boise, Ordinance No. 116, Microfilm Files, City Clerk's Office.

²⁴¹*Idaho Statesman*, March 4, 1892.

²⁴²See various issues of the *Idaho Daily Statesman*, March-June 1892.

²⁴³*Idaho Daily Statesman*, June 2, 1892.

²⁴⁴See various issues of the *Idaho Daily Statesman*, March-June, 1892.

²⁴⁵*Idaho Daily Statesman*, September 17, 1892.

²⁴⁶*Idaho Daily Statesman*, September 23, 1892.

²⁴⁷*Idaho Daily Statesman*, July 18, 1894.

²⁴⁸City Ordinance No. 231, November 12, 1897, City Clerk Microfilm Collection.

²⁴⁹Idaho State Historical Society Reference Series No. 363.

²⁵⁰*Idaho Statesman*, November 16, 1904.

²⁵¹Report of the City Engineer, Boise City, Idaho, July 31, 1911.

²⁵²*Idaho Daily Statesman*, November 28, 1904.

²⁵³Warden Whitney Report, 1907-1908.

²⁵⁴Annual report, Superintendent of Idaho Soldiers' Home for the year ending Dec 31, 1898. (Weiser: Signal Printing House, 1899).

²⁵⁵Annual Report for Idaho Soldiers' Home, 1903-1904.

²⁵⁶Idaho PUC Archives, roll 38, Doc F46.

²⁵⁷Report of the City Engineer, Boise City, Idaho, July 31, 1911.

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- ²⁶⁷Idaho State Historical Society.
- ²⁶⁸Letter dated January 31, 1929, from Boise Water Corporation to General Water Works Corporation, Idaho State Archive Manuscript Collection No. MS-395, Box 17.
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- ²⁷⁷*Idaho Tri-Weekly Statesman*, April 7, 1881.
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- ²⁸⁹Arthur A. Hart, "Cooling Off During the Dog Days," *Idaho Statesman*, August 24, 2004.
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²⁹⁹See General Laws of the State of Idaho passed at the Eighth Session of the State Legislature. Boise: Statesman Printing Co. and House Journal of the Idaho Legislature, Eighth Session, 1905: 154.

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Robert (Bob) Kent was born in 1943 on a farm in east Texas. After graduating from Terrell High School, Bob served five years in the United States Air Force (1961-1966). In 1972, he received a Bachelors of Science degree in Geology from the University of Texas at Austin. After a thirty-year consulting career in hydrogeology, Bob retired and moved to Boise, Idaho. Bob's thesis on Boise's water mirrors his long interest in the history of water supplies and associated water well technology.

Boise remains one of the few American cities with a privately owned municipal water system. In *Boise's Water*, historian Robert Kent explains how the Boise system reflected the city's reluctance to finance municipal projects, and how that privatism still shapes the city today.

"Bob Kent's study of Boise's water provides an outstanding historical perspective, and a clear understanding of where we are today."

-Chuck Mickelson

Public Works Director, City of Boise



Boise Public Works Department

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