

Milner Dam and Main Canal of the  
Twin Falls Canal Company  
Snake River  
Twin Falls Vicinity  
Jerome and Twin Falls Counties  
Idaho

HAER No. ID-15

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record  
National Park Service  
Western Region  
Department of Interior  
San Francisco, California 94102

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HISTORIC AMERICAN ENGINEERING RECORD  
Milner Dam and Main Canal of the Twin Falls Canal Company  
HAER No. ID-15

Location: Milner Dam and its canal system are located in Jerome and Twin Falls Counties on the Snake River approximately 11 miles west of the City of Burley, Idaho, U.S.G.S. 7.5 minute Milner (Idaho) Quadrangle. Universal Transverse Mercator Coordinates: Zone 11, North 4712086M, East 745508M.

Date of Construction: 1905

Engineers: A.J. Wiley and W.G. Filer

Present Use: Irrigation storage and distribution of irrigation water to desert lands for agricultural purposes.

Owners:	Twin Falls Canal Company	North Side Canal Company
	P.O. Box 326	921 N. Lincoln Avenue
	Twin Falls ID 83301	Jerome ID 83338

Significance: Milner Dam and its canal system have national significance in agricultural history as a rare successful example of state-supervised private irrigation development provided for in Senator Joseph M. Carey's reclamation statute of 1894.

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largely from the following documents:

"A History of the Twin Falls Canal Company" by J. Howard Moon, 1985 and "The History of Development and Current Status of the Carey Act in Idaho" by Mikel H. Williams, 1970

Date: June, 1989

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## Chapter I, Introduction

The Magic Valley area of south-central Idaho served by the Twin Falls Canal Company is covered by huge basaltic lava flows forced from fissures in the earth's crust and from volcanoes, the craters of which still dot the landscape. Beneath the basalt lie eight to ten older, rhyolitic flows separated by three to eight foot thick layers of clay and fine silt. Cutting through this geologic layer-cake to depths of up to 600-feet is the Snake River Canyon.

Near the canyon and its tributaries the surface soil averages three feet in depth. In other areas of the Magic Valley the soil averages nearly 10-feet in depth although underlying rock is often exposed at the surface.

There are four drainage streams crossing the south side of the canyon in the Twin Falls Canal System: Dry Creek at the eastern edge; Rock Creek running diagonally across the system; Cedar Draw west of center; and Deep Creek toward the western part of the project. Salmon Falls Creek Canyon forms the western border of the south side irrigation area. All of these drainage channels and other coulees are cut down to solid rock.

The soil is very productive when it receives adequate water. It is high in essential plant nutrients with the exception of nitrogen and humus which must be supplied through soil treatment. Physically, it is a fine, sandy loam with occasional small amounts of clay and mixed with traces of fine volcanic ash. (1)

The north and south sides of the Snake River Canyon are a high-desert plain, treeless in the natural state, but with large areas of sagebrush. Thin grass and willows are found along creek beds. Lack of accessible water made the area a place of suffering for early explorers and pioneers.

The earliest known human occupation in Idaho dates from 13000 B.C. at Wilson Butte Cave several miles north of the project area. It is not known if modern day Indians are descendants of these early inhabitants. By the mid-1700s changes in the Indian lifestyle commenced as a result of European exploration of the new world. Direct contact with explorers occurred in the early

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1 Sloan; Government Report of Investigation on the South Side Twin Falls Project, 1916, p. 2

1800s. Fur traders entered southern Idaho from Canada and the Upper Missouri River. Fur trapping and trade continued through the region but began to decline after 1840, and by 1860 the fur trade era of Idaho history had come to an end. By 1840, westward expansion was creating a demand for a route to the Oregon Territory. Early immigrants crossed southern Idaho following the Snake River along what became known as the Oregon Trail. In the 1860s with the discovery of gold, the construction of railroads and the introduction of irrigation ditches, people began to settle and remain in Idaho. By the late 1880s cattle and sheep ranching were the mainstays of the agricultural economy at least partly because of the livestock's ability to graze on the available grasses. Still, the lack of large, organized irrigation projects along the Snake River discouraged large-scale crop cultivation.

Finally, in 1894 Senator Carey of Wyoming came to the farmers' rescue, amending the Sundry Civil Appropriations Bill with provisions that would promote irrigation and reclamation of the West's vast desert areas. In Idaho a handful of visionaries caught the spirit of the Carey Act.

The idea for Milner Dam came in 1895 to Ira Perrine, an early Idaho entrepreneur. He discovered the site of the future dam while seeking a location for a railway bridge across the Snake. Perrine was quick to share his vision with investors who also saw the possibility and benefit of turning the dusty Snake River Plain into lush farmland.

Perrine and his partners found, though, that the dream would be hard won. Legal entanglements and the magnitude of the project discouraged some of the initial investors. The Twin Falls Land and Water Company soon found itself reorganizing and seeking money from east coast businessmen. Perrine, too, ultimately left the company, selling his stock to the new investors. The new company struggled, beleaguered now by construction difficulties, until the dream was finally realized and cool water flowed for the first time onto the Snake River Plain. Upon completion of Milner Dam and the associated irrigation canals in 1905, agricultural development in the Snake River Plain was assured and continues to this day.

Chapter II, Development of the Carey Act on the Federal and State  
Levels

The Carey Act was born out of necessity when late in the 1890's the land rush in the western United States faltered. Almost all land with an available source of water had been reclaimed and was under cultivation. The lands claimed by the earliest settlers were closest to the natural waterways, and it soon became evident that the lands lying farther from the streams could be put under cultivation only if expensive irrigation and diversion works were constructed. The Homestead Act and the Desert Land Law had been in effect for many years, but neither offered the necessary format for wide scale reclamation projects. The ingredients for reclamation, water and federal arid land, were present, but two things were lacking: construction works to deliver the water and some way to finance them. The western States were anxious to have the vast amounts of Federal lands patented to the residents of the respective States and were pressing Congress for some type of action. (1)

Feeling he had a solution to the problem, Senator Carey on July 16, 1894 introduced two amendments to the Sundry Civil Appropriations Bill incorporating his proposals to irrigate and reclaim these lands. (2) During Senate debate on the proposed amendments Senator Carey stated:

"There must be something done in the arid land States and Territories. I do not believe the Treasury of the United States will be in a condition for some years to come where the Government would be willing to appropriate money for the reclamation of lands in the arid States and Territories." (3)

Little opposition was offered to the proposed amendments in either the House of Representatives or the Senate. The act to which they were attached was officially entitled, "An act making appropriations for sundry civil expenses of the fiscal year

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1 3 Kinney on Irrigation and Water Rights, pp 2388 (2d Ed., 1912)

2 Cong. Rec. 1898:7515

3 Ibid. p.8123

ending June 30, 1894, and for other purposes." The Act was passed on June 30, 1894, and approved on August 18, 1894. (4) The text of the original act appears as follows:

"SECTION 4. That to aid the public land States in the reclamation of the desert land therein, and the settlement, cultivation and sale thereof in small tracts to actual settlers, the Secretary of the Interior with the approval of the President, be, and hereby is, authorized and empowered, upon proper application of the State to contract and agree, from time to time, with each of the States in which there may be situated desert lands as defined by the Act entitled "An Act to provide for the sale of desert land in certain States and Territories", approved March third, eighteen hundred and seventy-seven, and the Act amendatory thereof, approved March third, eighteen hundred and ninety-one, binding the United States to donate, grant and patent to the State free of cost for survey or price such desert lands, not exceeding one million acres in each State, as the State may cause to be irrigated, reclaimed, occupied, and not less than twenty acres of each one hundred and sixty-acre tract cultivated by actual settlers, within ten years next after the passage of this Act, as thoroughly as is required of citizens who may enter under the said desert land law.

"Before the application of any state is allowed or any contract of agreement is executed or any segregation of any of the land from the public domain is ordered by the Secretary of the Interior, the State shall file a map of the said land proposed to be irrigated which shall exhibit a plan showing the mode of the contemplated irrigation and which plan shall be sufficient to thoroughly irrigate and reclaim said land and prepare it to raise ordinary agricultural crops and shall also show the source of the water to be used for irrigation and

reclamation, and the Secretary of the Interior may make necessary regulations for the reservation of the lands applied for by the States to date from the date of the filing of the map and plan of irrigation, but such reservation shall be of no force whatever if such map and plan of irrigation shall not be approved. That any State contracting under this section is hereby authorized to make all necessary contracts to cause the said lands to be reclaimed, and to induce their settlement and cultivation in accordance with and subject to the provisions of this section; but the State shall not be authorized to lease any of said lands or to use or dispose of the same in any way whatever, except to secure their reclamation, cultivation and settlement.

"As fast as any State may furnish satisfactory proof according to such rules and regulations as may be prescribed by the Secretary of the Interior, that any of said lands are irrigated, reclaimed and occupied by actual settlers, patents shall be issued to the State or its assigns for said lands so reclaimed and settled. Provided, that said States shall not sell or dispose of more than one hundred and sixty acres of said lands to any one person, and any surplus of money derived by any State from the sale of said lands in excess of the cost of their reclamation, shall be held as a trust fund for and be applied to the reclamation of other desert lands in such State. That to enable the Secretary of the Interior to examine any of the lands that may be selected under the provisions of this section, there is hereby appropriated out of any moneys in the Treasury, not otherwise appropriated, one thousand dollars."

The act originally envisioned that the separate States accepting the Carey Act would operate as construction companies and build the diversion works, but it soon appeared that the treasuries of most of these States were in no better financial condition than the Treasury of the United States. In addition, many of the State Constitutions prohibited them from obtaining the necessary

financial credit for such undertakings. (5) The power given to a State to make any contract necessary for the reclamation of the lands could have been construed as a way for the States to contract with outside interests; however, private enterprise felt that irrigation projects would be too risky unless there was a way to guarantee adequate protection for their investment. To rectify this situation, the Carey Act was amended in 1896 to create a lien on the lands reclaimed for the cost of the construction, necessary expenses, and interest from the date of reclamation until it was disposed of to actual settlers. (6) The amendment also provided that the lands could be patented in the States when ". . . an ample supply of water is actually furnished in a substantial ditch or canal, or by artesian wells or reservoirs, to reclaim a particular tract or tracts of such lands, . . . without regard to settlement or cultivation." (7) The lands would then be held in trust by the State until the entryman had reclaimed the land. (8)

After this amendment the Carey Act presented a unique scheme never before attempted in the United States. Private enterprise would construct the irrigation works under State supervision and initially finance these projects by mortgaging its equity in the project, issuing bonds, or assigning its contracts with the settlers for the purchase of water rights. The ultimate profit would be derived from the sale of perpetual water rights to settlers on the project. After the settler had reclaimed the portion of this acreage established by statute, he could apply through the State to the Department of Interior for a patent to the lands. When the diversion works were completed by the construction company and accepted by the State, the project, including title to the irrigation works, would be turned over to an operating company composed of the entrymen on the project. One of the most important characteristics of the Act was that it

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5 Kinney: p.2385

6 Idaho allows two liens: one for construction and one for maintenance and upkeep on the irrigation works. Brown vs Portneuf-Marsh Valley Irrigation Co., (DC Idaho) 229 F.338, 5 F.2d 895, aff'd 274 U.S. 630, 47 S.Ct. 692, 71 L. Ed. 1234 (1925)

7 29 Stat. 422; 43 U.S.C. YY 641 (1896)

8 Bothwell vs Bingham County, 24 Idaho 125, 132 P.972, aff'd. 237 U.S. 642, 35 S.Ct. 702, 59 L. Ed. 1157 (1913)

required reclamation by irrigation, occupation, and cultivation before a patent would be issued; unless, as provided in the 1896 amendment, sufficient water was already available in substantial ditches or reservoirs to reclaim the lands.

To implement the Carey Act three contracts were contemplated. The first would be between the Federal Government and the State which proposed the project. The second would be between the State and the construction company. The third contract would be between the construction company and the settlers on the project.

Generally, the Federal Government and the State contracted that the Government would convey the lands to the State free from costs when an ample supply of water was furnished for reclamation, provided the lands were developed within the statutory period. The State would agree not to use the land in any way other than settlement, reclamation and cultivation in 160-acre tracts by actual settlers. The State would have the power to make any contract necessary to secure the reclamation of the lands; however, in no case could the State contract in a manner that might make the Federal Government liable on the contract.

In its contract with the State, the construction company would generally present proof that a valid water right existed or that one was in the process of being perfected. The contract would detail what was required of the company involved in constructing the irrigation works, such as: specification for construction of the irrigation works; sale of water rights to the settlers; capacities; rights-of-way; and other particulars. This contract formed the guidelines for the development of a Carey Act project. When the conditions of this contract were executed, the project was generally ready to be turned over to the operating company. The State could effectively ensure that the diversion works were adequately constructed according to contract specifications by refusing to accept the contract until the State officials were satisfied.

The contract between the construction company and the settlers would define the conditions surrounding the sale of water rights and the volume of water to be delivered to the lands. It would also include the terms for turning the project over to the settlers, and establishment of the settlers' operating company.

The Carey Act authorized the States to supervise the construction of the diversion works and ensure that the lands were reclaimed. Part of the State's responsibility in administering the Carey Act was providing the Department of Interior, prior to allowing actual construction to commence, with a map showing the lands proposed to be irrigated, the method of irrigation, and the source of water to be used for the project. This map had to be filed by the State before the segregation could be approved. (9) The lands selected had to be arid lands in character as defined by the Desert Land Law. (10) The State had to see that the lands were reclaimed, settled and put under cultivation.

The Act provided that the State would have 10 years after withdrawal in which to reclaim the lands segregated from the public domain. An amendment passed in 1901 allowed for a five year extension of time at the discretion of the Secretary of Interior. (11)

After the segregation was allowed the company had three years in which to commence construction; however, an extension of three years could be granted. (12) When construction was finished or when sufficient water was made available to reclaim a portion of the segregation, the construction company could petition the State for a public land opening on the project.

The Act required that after the end of the fifteen year period, assuming an extension had been granted, one-eighth of the land entered upon by the entryman had to be reclaimed. The maximum amount of land that could be settled by any one person was one hundred and sixty acres. After the entryman had reclaimed his land, the State would issue a final certificate to him and request a patent from the Federal Government, which would be conveyed to the entryman upon receipt. Any money the State received as a result of the Carey Act had to be placed in a trust

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9 28 Stat. 422; 43 U.S.C. YY 641 (1894)

10 Desert Land Act, 19 Stat. 377, 43 U.S.C. YY 321 (1877). Defined as: ". . . all lands exclusive of timber lands which will not, without artificial irrigation, produce some agriculture crop, shall be deemed desert land."

11 31 Stat. 1188; 43 U.S.C. YY 641 (1901)

12 41 Stat. 1085; 43 U.S.C. YY 641 (1921)

fund used for the reclamation of other desert lands or for operating expenses.

In 1910 an important amendment to the Carey Act was enacted authorizing the temporary withdrawal of lands for one year for the purpose of making studies and surveys to determine the feasibility of the proposal. (13) If the plan or proposed construction of the irrigation works seemed plausible, the proposers could ask for a permanent segregation of the land. If the request for a permanent segregation was not made within the one year period, the land reverted back to public domain.

In 1911 an attempt was made to make water readily available for some of the more destitute Carey Act projects. Congress passed a statute authorizing the sale of surplus water by the Bureau of Reclamation to any Carey Act project. (14)

In 1920 congressional attention shifted to the problem of entrymen forced off a Carey Act project. Usually the main factors behind a reduction of area and entrymen was the lack of water or funds to complete the project. To relieve this situation Congress allowed an entryman forced off a project to perfect his title under another land law if he acted within 90 days. The entryman could qualify for this provision only if he "had established actual bona fide residence or had made substantial and permanent improvements" on the lands. (15)

Few additional legislative changes were made by Congress until 1954. During the interim period a substantial number of regulations were announced by the Department of Interior. For the most part, after the passage of the Act in 1894, statutory development rested with the States.

Almost immediately after the passage of the Carey Act, many State legislatures in the western United States enacted laws accepting the conditions of the federal grant. Altogether, 12 western states accepted the Act: Arizona; California; Colorado; Idaho; Montana; Nevada; New Mexico; Oregon; South Dakota; Utah;

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13 36 Stat. 237; 43 U.S.C. YY 643 (1910)

14 36 Stat. 925; 43 U.S.C. YY 523-525 (1911)

15 41 Stat. 407; 43 U.S.C. YY 644 (1920)

Washington; and Wyoming. (16) Most of the legislatures in these States enacted similar provisions to administer the Carey Act.

The states of Arizona, California and Washington accepted provisions of the Act. However, the law did not result in any lands being patented in those states. There are no records available as to development, if any, of the Act in South Dakota.

Colorado, Montana, New Mexico and Nevada enjoyed some success under the law, with a total of 136,308.40 acres being patented within the four states. Utah successfully patented 37,239.98 acres. The act resulted in patents on 73,442.08 acres in the state of Oregon. Wyoming successfully patented 198,530.96 acres. Idaho, the most successful of the states, patented a total of 629,724.87 acres.

Because of the limited success of the Carey Act and other early reclamation efforts the Federal Government passed the Reclamation Act in 1902. The Act was signed by President Theodore Roosevelt on June 17th of that year. The statute dedicated the proceeds from public land sales to a revolving "Reclamation Fund" that financed water storage and diversion works in 16 Western States and Territories (Texas was added in 1906). Under this Act irrigable public lands were subject to entry under the 1862 Homestead Act, with each settler obligated to repay his proportionate share of construction cost in 10 years. Local water user associations would assume operation and maintenance responsibilities once half of the repayment obligations were met, but the Federal Government retained title to major works. State and territorial laws governed the appropriation, use and distribution of project water. The Reclamation Act enjoyed much broader success than the Carey Act or other early attempts to irrigate arid public lands. Early success of the Act include projects such as Theodore Roosevelt Dam in Arizona, Elephant Butte Dam in New Mexico and Arrowrock Dam and Minidoka Dam in

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16 Ariz. Rev. Stat. ch. 3, Y 37-701 (1956); Deerings Gen. Laws, Act 6283, Y 1-51 (1937); Colo. Rev. Stat. ch. 112, Y 112-2-1 (1963); Idaho Code, ch. 17, Y 42-1701 (1947); Rev. Code Mont., ch. 21, Y 81-2101 to 81-2130 (1947), Repealed, Laws of 1963, ch. 146 Y 242, Laws of 1965, ch. 280, Y 22; Nev. Rev. Stat. ch. 324, Y 324.020 (1967); N.M. Stat. ch. 7, Y 7-4-1 (1953); Ore. Rev. Stat. ch. 555, Y 555.010 (1955); Laws of S.D., p. 135 (1909); Utah Code, ch. 3, Y 65-3-1 (1953); Rev. Code of Wash. ch. 77, Y 79-48 (1959); Wyo. Stat. ch. 8, Y 36-83 (1957)

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Idaho. The Act led to the creation of the Bureau of Reclamation which developed many successful large scale public works.

### Chapter III, Geographic Placement and Project Description

Milner Dam and the Twin Falls South Side Main Canal are located on the Snake River in the "Magic Valley" of south central Idaho. The projects are located entirely in Twin Falls County with the exception of the north half of the dam, which is located in Jerome County.

Milner Dam was constructed in 1905 to provide irrigation storage and diversion. The dam is owned jointly by the Twin Falls Canal Company, the North Side Canal Company and the American Falls Reservoir District Number 2.

The site for Milner Dam consists of three channels in the river canyon separated by two islands. The north channel normally carried the main flow of the river. The south channel carried water only during extreme floods. The middle channel was dry except during periods of high water.

The three Milner Dam embankments are constructed with a trapezoidal shaped rock fill section forming the downstream portion of the embankments. The rock fill was built around a vertical wood core. Placed directly against the upstream slope of this fill section is a triangular shaped earth fill zone.

The upstream face of each embankment was built at a 4:1 (horizontal:vertical) slope. The earth fill zone is built of non-plastic sandy silt or silty sand placed directly against the rock fill. Rip-rap is placed on the face of the upstream shell at and above the elevation of the gated spillway crest.

The dam has a gated spillway which is used to release water from the reservoir and to pass flood flows. The original 99 spillway gates are located on the south half of the dam. Presently, only 87 of the wooden, hand-operated gates are in working order. In addition, there is an ungated overflow spillway located in the north embankment of the dam which would operate in the event of a major flood. The dam has no operable low level outlet or reservoir drain.

At the present time, flow into the Twin Falls Main Canal from Milner Lake is controlled by a concrete structure housing seven manually operated radial gates 12 feet wide by 11 feet high. Old drawings and inspection of the structure show that one additional equal size radial gate originally existed on each end of the present gates. These were replaced with concrete walls and

smaller sluice gates. These sluice gates are no longer used and appear to be inoperable. The structure was recently strengthened by adding 7-foot high buttresses anchored into rock behind the old piers and gate pinions, but such work was considered temporary and continued use of the structure will require further rehabilitation.

Three canals with their headworks adjacent to the dam are fed from Milner Lake. The Main Canal of the Twin Falls Canal Company (sometimes referred to as the Southside Main Canal) was constructed in 1909 to serve the south side irrigation tract. Its headworks are located near the left (south) abutment of the dam. Water in the canal flows west near the Snake River for about 12 miles.

The North Side Canal and the Milner-Gooding Canal are located near the right (north) abutment of the dam. The North Side Canal was built and is maintained by the North Side Canal Company. The U.S. Bureau of Reclamation constructed the Milner-Gooding Canal under the Reclamation Act. It was the "Gooding Division" of the Minidoka Project. At the time the Milner-Gooding Canal was being proposed, the North Side Main Canal did not have enough capacity to serve all of the company needs. When the Bureau of Reclamation started planning the Gooding division, NSCC asked to buy capacity in the canal for 1000 cfs. The NSCC signed a contract and paid a pro rata share of the canal construction cost. The canal company still pays pro rata O & M cost for their 1000 cfs.

The Milner Low Lift Irrigation District was organized in 1921. This too, was promoted by the Bureau of Reclamation. The district irrigates 12,000 acres above the Twin Falls Canal Company's Main Canal. About 1984 the district changed its name to the Milner Irrigation District. All Milner Irrigation District water is pumped from the Milner Reservoir at a point about one-half mile upstream of the dam on the south (left) shore of the reservoir.

The A & B Irrigation District development (between the NSCC on the west and the Minidoka Irrigation District on the east) came into being during the late 1950's and early 1960's. While most of the lands are watered with ground water, about 10,000 acres of their development pumps water from Milner Reservoir upstream a few miles from the dam on the north (right) bank. They own 46,826 acre/feet of Palisades Reservoir water for this purpose.

In addition to organized irrigation districts, between 300-500 smaller pumps extract water from the reservoir for home irrigation and other uses.

The Twin Falls Irrigation Tract was constructed in 1905 to 1909 with water diverted from the Snake River at Milner Dam and flowing generally westward by gravity to irrigate the fertile land on the south side of the Snake River Canyon. The water diverted at Milner Dam flows in the Main Line Canal approximately 8 1/2 miles to Murtaugh Lake, a re-regulating reservoir, and then flows a little over 10 miles to the Forks, a point at which the flow is split into the High Line Canal and the Low Line Canal. The High Line Canal continues along the foot hill dropping in elevation only sufficient to maintain flow for approximately 47 miles until the remaining water discharges into Deep Creek. The Low Line Canal drops over 90 feet at the Forks and then meanders through the middle of the tract for over 35 miles to a point where the remaining water is also discharged into Deep Creek. Taps along the Main Line Canal provide water for laterals to irrigate the lands between the canal and the canyon rim. Water in laterals from taps in the High Line Canal is used to irrigate lands below the High Line Canal and above the Low Line Canal. Return flows from this part of the tract are picked up on the Low Line and are used to supplement the normal flow in the Low Line Canal. Taps in the Low Line Canal provide water for laterals to irrigate the lands between the canal and the canyon rim.

The natural drainage channels, creeks and coulees, which would normally be dry during the irrigation season, are utilized as part of the delivery system. Water is fed into coulees from the canals and is diverted into laterals further down the coulee to distribute water to other portions of the tract. Cedar Draw, Deep Creek and Mud Creek are also used for distribution of water in this manner.

The Clover Irrigation Pumping Company (formerly the High Line Canal Company) operates pumps to lift the water from the Twin Falls High Line Canal to approximately 5,000 acres which lie above the canal in an area south of Buhl, Idaho.

The Canal Company still has 202,689.91 shares of stock outstanding, the same number as originally issued. The sale of stock by the Twin Falls Land and Water Company, the developer of the tract and the predecessor to the Twin Falls Canal Company, was on the basis of a share per acre. There have been many transfers of

shares in the intervening years, but the tract is still essentially on a one share per acre basis.

The extent of the tract is generally the same as the original tract. However as areas were urbanized the water was sold off and generally moved to irrigate lands lying above the canals by pumping. The largest portion of the land irrigated by pumping transferred water lies on the butte west of Murtaugh.

Although many of the taps and headgates have been replaced at least once since the original construction, the distribution system is operated essentially in the same manner as originally designed.

Initially, water was kept in the system year round since it was needed for municipal supplies as well as domestic and stock purposes. With the formalization of contracts for water from Palisades Dam in the late 1950's, the Twin Falls Canal Company stopped winter water deliveries in exchange for priorities for water stored under other contracts. Now the irrigation season is from March through October of each year with the starting and ending dates established according to the climatic conditions and the needs of the irrigators.

The Twin Falls Canal Company has decreed rights to natural flow in the Snake River of:

3,000 cfs with an October 11, 1900, priority date  
600 cfs with a December 22, 1915, priority date  
180 cfs with an April 1, 1939, priority date

The Canal Company supplements natural flow with storage water as follows:

American Falls Reservoir	147,035 Acre feet
Jackson Reservoir	97,183 Acre feet

The above water rights assure the irrigators of the tract with an adequate water supply in all but extreme drought years.

The Canal Company contractually must deliver five-eighths of a miner's inch of water for each share of stock for the entire irrigation season. Traditionally the Canal Company has been able to deliver three-quarters of a miner's inch of water per share although reductions must be made during drought years.

Delivery of water and diversions at Milner are based upon the demand of the irrigators. Each irrigator must advise his ditchrider 24 to 48 hours in advance of water turn on or change in flow. The 28 ditchriders combine the demand for the succeeding days and advise the area watermaster in the main office. The watermaster combines all demands and notifies the dam tender at Milner Dam by 8:00 AM each day.

The dam tender at Milner, an employee of the Twin Falls Canal Company, receives water demands for the succeeding days from the Twin Falls Canal Company, the North Side Canal Company and the American Falls Reservoir District No. 2, all of whom divert water at Milner Dam. The dam tender combines all of the demands and notifies the Bureau of Reclamation in Burley. The River Operations Manager of the Bureau in turn notifies the Watermaster of Water District No. 1 in Idaho Falls who coordinates the needs of all water users of the upper Snake River Basin. The Watermaster in Idaho Falls then determines the releases from each of the storage reservoirs to supply the demands of the various entities. A similar procedure is followed by the Milner Irrigation District (12,000 acres) and the A & B Irrigation District (10,000 acres), both of which Districts pump from the Milner Reservoir.

During the irrigation season the dam tender at Milner must maintain Milner Reservoir at least to elevation 11.00 on the gage (by court order to assure that full deliveries can be made to the canal of the American Falls Reservoir District No. 2), but must not exceed 11.25 on the gage as the high water begins to flood low lying areas of Burley. The dam tender must also avoid spilling water as all water passing Milner after the end of the spring run off will be charged by the Watermaster of Water District No. 1 as storage water used by the Twin Falls and North Side Canal Companies in proportion to their ownership of Milner Dam.

Diversions at Milner during summer months are normally around 3,600 cfs although they can reach 3,800 cfs during periods of peak demand.

Water is distributed by the 28 ditchriders to over 4,000 stockholders through some 3,000 headgates or other delivery devices. Each delivery point has the capability of being locked and includes a measuring device. The ditchrider can then regulate flow at each delivery point and lock the facility to prevent tampering by others. Most of the measuring devices are a double panel arrangement which results in a constant head orifice.

The original contract called for water to be delivered at a delivery gate within one half mile of the farmer's land. Many gates deliver to more than one stockholder, but the responsibility of the Canal Company ends at the delivery gate.

Maintenance of the distribution system is a two phase operation depending on whether there is water in the system.

During irrigation season the crews work at weed control, moss control and rodent control as well as continuous maintenance of canal banks and other parts of the system that can be worked with water in the system.

Weed control consists of spraying the canal and lateral banks with herbicide, planting crested wheat to choke out weeds in areas of new construction, and mowing weeds along banks.

Moss control consists of injecting chemicals into the water to kill the moss or dragging an anchor chain along the bottom using a tractor on each bank to break off and uproot the moss.

The Canal Company employs a full time trapper to eliminate burrowing rodents throughout the system. Trapping, shooting and poisons are used as permitted by law. A continuing program of removal of rock piles along the canals and laterals has eliminated most of the habitat for rock chucks and has lessened their population. Rodent holes are a constant threat to the system since they can cause breaks in the banks, with the accompanying flood damage and lack of water during the time of repair.

Although replacement of structures and shaping of canals is more difficult during the cold winter months, it is the only time when the system is dry and this work can be accomplished.

#### Chapter IV, Ira Burton Perrine and Other Developers

According to the only existing interview with Perrine regarding how he got the idea of reclaiming the land above the Snake River Canyon, he was asked in 1895 by the Oregon Short Line Railroad to find a bridge site over the river between Lincoln and Cassia Counties because the Southern Pacific Railroad was drawing all the trade from Cassia County. He explored the river and located the present site of Milner Dam as a railroad bridge. (1) The Carey Act of 1894 having made area reclamation feasible, Perrine's plans took shape. In 1898 he made J.H. Lowell and A.K. Steunenberg aware of the plausibility of reclamation by a dam structure.

In late August 1898, Idaho Senator George Shoup announced that a movement had been initiated by the National Park Service to establish the Snake River area as a National Park Reserve. The projected park would include Twin Falls, Shoshone Falls, Blue Lakes and other points of interest in the Snake River Canyon. (2) All adjacent lands would be withdrawn while the project was studied. The withdrawal of lands meant that hunting was prohibited. Fishing, limited grazing, and limited mining was allowed. Water resources could not be used for irrigation or for the generation of hydroelectric power. (3) Due to local opposition plans for a park reserve did not materialize, however, by the summer of 1900 Perrine decided to file on the Snake River. Together with James Lowell, Albert Steunenberg, Stanley B. Milner and Frank Knox, he formed the Twin Falls Land and Water Company to build a dam and reclaim land on both the north and south sides of the Snake River.

Stanley B. Milner was a mining acquaintance of Perrine; they met while investigating placer mining sites along the Snake River. Milner was born in Grant County, Wisconsin, January 11, 1850, to

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1 Twin Falls News, Twin Falls, ID, 28 Oct., 1904, p. 4, col. 3,4

2 Idaho Daily Statesman, Boise, ID., 1 Sept, 1898, p.4, col. 3,4

3 Shoshone Journal, Shoshone, ID., 11 July, 1902, p.1, col.1

British-born parents John and Sarah Selina Bark Milner. (4) He formed the Milner Corporation to invest in mine properties. (5) Described as being of a retiring nature, he was, never-the-less, a director of the National Bank of the Republic in Salt Lake City, was co-owner of the Annie Laurie Mine and other mining properties in Iron and Washington Counties in Utah, as well as coal mines in Carbon County, Utah, and the Dexter-Tuscarora Mining Company in Tuscarora, Nevada. (6) Completely out of his element in this irrigation venture, Milner gave financial backing but bowed to the technical superiority of J.H. Lowell to steer the course for the first two years of effort at the dam site and town named for him -- Milner. In 1906 he took again the duty given him when the Twin Falls Company incorporated -- President of the Corporation. Although seriously ill he came to Idaho and worked to prepare the townsite of Buhl for its opening April 17, 1906. He returned to Salt Lake following the successful Buhl opening and quickly wasted away. In announcing his death on May 3, 1906, the Salt Lake Herald stated, "He overtaxed his energies during a recent trip to Idaho and on his return took to his bed, growing gradually worse until the end." (7)

James Harrison Lowell, widely known as the father of Idaho Reclamation, was born May 4, 1860, at New Bedford, Massachusetts. Prepared for a career as a teacher, Lowell moved to California at nineteen and taught school in Los Angeles. In 1884, he designed a tunnel system for bringing water to an orchard he was developing, the first of many irrigation ventures. He moved to Livingston, Montana, where he started a sheep ranch and helped establish another irrigation system. After working on the Yakima Valley Irrigation system in the state of Washington, Lowell came to the Boise area in 1893. His major contribution to the Twin Falls Land and Water Company was made in 1898 regarding the park preserve plan. He and Frank Gooding were appointed by Governor Frank Steunenberg to urge Congress to reconsider and designate

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4 State of Utah, Bureau of Vital Statistics, Death Certificate No. 500

5 Salt Lake Herald, Salt Lake City, Utah, 3 May, 1906, p.2, col.1,2

6 Ibid.

7 Ibid.

the land for agricultural purposes. (8) He later withdrew from the Twin Falls Land and Water Company when he realized he did not have the personal wealth to continue financing such an extensive undertaking. His subsequent water projects include Deer Flat Reservoir and the extensions of the New York Canal to the reservoir now known as Lake Lowell (both projects located in Canyon County, Idaho). Lowell was married to Florence Hard. He died December 14, 1944.

Albert Keppel Steunenberg was born September 11, 1863, in Knoxville, Iowa. In 1886, together with his brother Frank Steunenberg (later Governor of Idaho), he began publication of the Caldwell Tribune; he also published the Idaho Odd Fellow, a journal of the Idaho Grand Lodge of Odd Fellows, of which he was a member. (9) On May 25, 1890, he married Carrie Mae Coulter at Bondurant, Iowa. He established the Commercial Bank of Caldwell in 1898, later merging with the Caldwell Banking and Trust Company, of which he was President until his death. (10) He was also director or president of more than a dozen other banks in the State. Steunenberg gave active financial backing to the Twin Falls Land and Water Company, and received corporate shares for his investments. In 1902, when the immensity of the project was realized and the courts allowed the continuation of the project, Steunenberg withdrew from the corporation. He was not in good health and felt, as did Lowell, that he could not fund so extensive a system. An acute illness caused his death March 16, 1907. (11)

Frank Knox was born March 25, 1857 at Washington, Iowa. In 1885, he was named manager of the First National Bank of Osborne, Kansas, and organized the National Bank of Commerce of Kansas City, Kansas, as well as two other Kansas State Banks. In 1882, he married Julia May Cramby. In 1889, Knox disposed of his Kansas interests and moved to Salt Lake City. He opened the highly successful Bank of the Republic in 1890. He invested in

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- 8 Parma Review, Parma, ID., 21 Dec., 1944, p.1, col.6
- 9 Caldwell Tribune, Caldwell, ID., 21 Mar., 1907, p.2, col.1
- 10 Idaho Daily Statesman, 17 Mar., 1907, p.1, col.3
- 11 Evening Capital News, Boise, ID., 18 Mar., 1907, p.1, col.3

mining properties owned by Stanley B. Milner, and their association led him to make his minor, but extremely important, investment in the Twin Falls Land and Water Company. (12) When Steunenberg and Lowell withdrew from the Corporation, their shares equaled those held by Milner and Perrine. Steunenberg and Lowell's suggestion that the corporation be dissolved and turned over to either State or national resources was voted down by the equal votes of Perrine and Milner plus the ten votes held by Knox. (13) Knox was the only individual to hold shares in the corporation from the incorporation date until its dissolution on December 13, 1940. Although he had died September 24, 1915, his heirs maintained 500 shares in his name. (14)

Water appropriations of 3,000 cubic feet per second of Snake River water were claimed for each side of the Snake River by Perrine, June 25, 1900. Perrine writes that the canal was planned to extend westerly about sixty miles. (15) Both north and south side claims were filed with the State on July 6, 1900.

The claim to water required the claimant to make proof upon the site and to incorporate a working company within ninety days or forfeit the claim. Perrine later wrote in a notarized statement that in the weeks between the filing and subsequent incorporation of the Twin Falls Land and Water Company, he worked on plans, crude canal and dam surveys, and other necessary items. (16)

The Twin Falls Land and Water Company Agreement of Incorporation was made September 3, 1900, at Salt Lake City, County of Salt Lake, Utah. The stated purposes and objects of the corporation

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12 Herald Republican of Salt Lake, Salt Lake City, UT., 26 Sept., 1915, p.24, col.4,5

13 Shoshone Journal, 11 July, 1902, p.1, col.1-3

14 State of Utah, Office of Sec. of State, Articles of Dissolution of Twin Falls Land and Water Co., p.7

15 The north side filing is at Lincoln County, Idaho Court House; Water Filings, Book 1, p.229. The south side claim original is in MSS 114, Documents and Contracts, Idaho State Historical Library. Local record is in the Twin Falls County, Idaho Court House, Miscellaneous Book 1, p. 106

16 State of Idaho, Idaho State Historical Library, MSS 114

were . . . the acquisition, construction, operation, maintenance, rental, and sale of canals, aqueducts, and ditches for the flowage of water, chiefly for irrigation, and the acquisition, rental and sale of water conveyed and distributed through said waterways, and in connection therewith to improve, reclaim, cultivate, buy, rent, and sell land with necessary structures connected therewith, and in general, doing all things necessary in the construction of its general irrigation system, and in the development and improvement of the land appurtenant to, and which may be reclaimed by said irrigation system. Also, to acquire all water rights, rights of way, franchises, and other rights incidental to the business of the corporation. In connection with the foregoing pursuits, the corporation, through its Board of Directors, shall have power to borrow money, issue bonds, and secure its obligations by liens upon its property, rights, and franchises of every description. (17) The company offices were at Salt Lake City, Utah; the Idaho offices were located at Lowell's home at Roswell, Idaho.

The proposed segregation of 244,025 acres was requested on August 15, 1900 so that an initial survey could be made. (18) The company was incorporated two weeks later and the completed survey was presented to the office of State Engineer D.W. Ross on October 6, 1900. (Photograph ID-15-198; A diagram of the proposed dam and canal headgates is included in the upper right, Photo ID-15-184). This segregation map shows a proposed canal system which, in greatly altered state, approximates the present highline system. The water rights were granted by the State Engineer on October 8, 1900, for 3,400 cfs of Snake River Water to be taken out at the south and north points at the Cedars where Perrine had staked his original claims. (19) Three thousand cfs were for the south side segregation and 400 cfs were for the north side. On October 11, 1900, the Twin Falls Land and Water Company restaked and reclaimed the water rights at Milner in the amounts already granted it by the State under Perrine's June 25,

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17 State of Utah, Office of Sec. of State, No.3140, Book U., pp. 513-518

18 State of Idaho, Minutes of State Land Board, Book 1, p. 243

19 State of Idaho, Miscellaneous Book 1, p. 111

1900 claim. (20) On October 12, 1900, Lowell, representing the company, presented to the State Land Board application for the withdrawal of the lands under the proposed segregation. (21) The application was made at Hailey, Idaho on October 16, 1900. The State Land Board minutes indicate the company requested that certain lots or sections be omitted from the segregation to be used as townsites. Frank Steunenberg was asked to represent the State before the Department at Washington, D.C. to amend the requested list, (22) as well as a list of omissions for placer mines. (23) The Articles of Agreement were made July 1, 1901. (24)

Following several months of legal entanglements revolving around the construction of a power plant on Shoshone Falls (located approximately 30 miles below the dam site), Milner ordered preparations for construction including establishment of a permanent camp at the head of the canal. Milner's associate, Walter Filer, began the necessary survey for the town of Milner and planned the construction camp. Materials were shipped from Shoshone to build a bridge below the dam site and construction was underway. (25)

During the months of controversy and court intricacies, Steunenberg and Lowell, increasingly pessimistic regarding their own financial resources, felt the corporation should be dissolved and the project turned over to the State or Federal bureaus. When Milner decided to purchase the mens' stock shares they withdrew from the corporation. \$21,000 was paid in cash to the two with an additional \$80,000 to be paid them over a three year period, a debt to be repaid from the first lands sold under the

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20 State of Idaho, Idaho Historical Library, MSS 114, Documents and Contracts

21 State of Idaho, Minutes of State Land Board, Book 1, p.250

22 Ibid. pp. 270-271

23 Ibid. p. 273

24 State of Idaho, Idaho Historical Library, MSS 114, Documents and Contracts

25 Shoshone Journal, 2 May, 1902, p. 1, col. 1

MILNER DAM AND MAIN CANAL OF  
THE TWIN FALLS CANAL COMPANY  
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future enterprise. (26) This split of the corporation left an immediate need to raise capital.

## Chapter V, Reorganization

Perrine contacted several financiers, each of whom rejected the proposed dam and canal system as impractical and with a dubious future. Much of the doubt was cast because the Shoshone Power Company would need water, which constituted an antagonistic water right, an argument used by Lowell and Steunenberg when they left the company. In low water years, went the argument, the company would need the water for irrigation, thus crippling the power plant. If Shoshone Power Company could prove a superior right to water, the irrigation system would be left without sufficient supply. (1) The majority of those presented with the plan simply had no experience in such matters, felt incapable of working with it and were too cautious to finance such a project.

Perrine had himself claimed the water rights at Shoshone Falls on November 1, 1901. (2) He and H.L. Hollister had worked on ideas and plans for about five years, hoping to install a power plant. After the park reserve was cancelled, Perrine lost little time in securing the water right and working on the cofferdam, causing the legal delays. He hoped to bring accord in the situation and combine the power venture with the irrigation proposal. Capitalists were not interested in such a scheme. (3)

Walter George Filer, an associate of Milner's at the Annie Laurie Mine, knew eastern investors. Taking advantage of a visit west by mining capitalist Frank H. Buhl to an associate, Witcher Jones, Filer presented the needs of the Twin Falls Company. His efforts, along with Jones' recommendations, led Buhl to agree to visit the area. Buhl made no major decisions without the full support of his wife, so the visit had to wait for a time when both Buhls could be present. The State Land Board, watching time pass with no appreciable progress, ordered, at their September 16, 1902, meeting, that the President and Secretary of the Twin Falls Land and Water Company appear before the Board on November 8, 1902 to show the Board that they were prepared to fulfill the agreement between the State of Idaho and the Secretary of the

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- 1 Shoshone Journal, Shoshone ID. 11 July, 1902, p. 1, col. 1
  - 2 Lincoln County, Idaho; Lincoln County Water Rights, Book 1, p. 241
  - 3 Shoshone Journal, 11 July, 1902, p. 1, col. 2,3

Interior. (4) Lawyer S.H. Hays requested, and was granted, an extension of time. (5)

Walter George Filer was born January 1, 1870, at Sharon, Pennsylvania, the son of London-born parents Enoch and Elizabeth Lawton Filer. (6) He graduated in civil engineering from Hasbrouck Institute in Jersey City, New Jersey, where he was a classmate of Mark M. Murtaugh with whom he would later be associated in building the Twin Falls Tract. His early involvement was with railroad building in New York and New Jersey. Coming west in 1895 to Helena, Montana, he engaged in mining engineering with Paul S.A. Bickel, who later joined in the Twin Falls project. In 1899 Filer joined the S.B. Milner mining enterprises of Salt Lake City and was named manager of the Annie Laurie Mines. His association with Milner led him to help with the 1901 survey of the Twin Falls land. Two Chief Engineers on the job seem a bit much, but Milner had no faith in the Idaho men or in the survey they made. Filer's years as general manager of the Twin Falls project kept him constantly in the middle of differences in opinion between the eastern capitalists, whom he understood well, and their western counterparts whom he understood equally well. Filer married Miss Esther Browning Freed in Salt Lake City, May 25, 1901. (7) The Freed Family were business and civic leaders in Salt Lake City. In the re-organization of the Twin Falls Land and Water Company in early to mid-January 1903, Filer became holder of 10,000 shares, 10 percent of the corporate stock. (8) For the next three years he acted as on-the-scene overseer of the work at the dam site and canal system while maintaining home base at Salt Lake City.

Witcher Jones' involvement in the Twin Falls Land and Water Company was minor. Two months after his visit to the Twin Falls

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4 State of Idaho, Minutes of the State Land Board, Book 1, p. 359

5 Ibid, p. 363

6 State of California, Bureau of Vital Statistics, Death Certificate No. F460 (43029343), two pages

7 State of Utah, Marriage License No. 10371

8 State of Idaho, Idaho Historical Library, MSS 114, Documents and Contracts

Tract he became agitated over the sudden loss of Buhl's funding in his own enterprises and left for the east. He had long been afflicted with heart trouble and was taken ill at Denver. A complication with pneumonia made his sickness serious from the start. (9) Witcher Jones died at Denver, January 31, 1903. Mrs. Jones signed over 2,100 acre rights to her son-in-law, J.R. Walker, June 23, 1903, and 400 rights to T. Ellis Browne, June 2, 1903. Browne sold his 400 shares of water on June 23, 1903, to Filer. (10)

The man whom Filer and Jones interested in the Twin Falls Land and Water Company had long invested in mining ventures. At heart he was a philanthropist, but he could be a hard-nosed business man. Frank Henry Buhl was born August 3, 1848, at Detroit, Michigan, the son of Detroit's first Mayor, Christian H. Buhl. (11) The Buhls were social and business forces in Detroit and Frank received a good education both at school and at home where the intricacies of the business world were freely discussed. Among young Buhl's earliest investments was the Sharon Iron Mills at Sharon, Pennsylvania. From that beginning his interests fanned out into mining and related enterprises. He was an established businessman and wealthy investor when he married Julia Forker of Mercer, Pa., February 9, 1888. (12) Further investments were made in what has been called a "shared sense" of what the Buhls could do to advance a worthy cause. This was exemplified in the many philanthropic works accomplished in the Sharon area, in the Magic Valley, where the irrigation structure and a town commemorate him, and in Minnesota, where the town of Buhl nestles in the Mesabi iron range. In 1902 his estimated assets were \$25,000,000. (13)

The contract between the State Board of Land Commissioners and Twin Falls Land and Water Company was made and signed January 2,

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9 Salt Lake Herald, Salt Lake City, UT., Feb., 1903, p. 1, col. 3,4

10 State of Idaho, Idaho Historical Library, MSS 114, M.B. DeLong Correspondence

11 The Sharon Herald, Sharon, PA., 7 Aug., 1980

12 Ibid.

13 Ibid.

1903. (14) It stated the purposes of the dam and canal systems and gave general specifications for the dam and South Side Canal as follows: "Dam: Water to be raised above its present level thirty-eight feet by closing the present three channels of the river by loose rock embankment or masonry or concrete dams, thereby forcing the water over two islands of solid lava rock, which will be blasted down to form a suitable crest and will give a free waterway of 815 feet; rock embankment to be carried six feet above extreme high water, to have a slope of 1:1 and to be backfilled with gravel or earth on slope of 1-1/2:1.

"South Side Canal: Total length about sixty-five miles, first section (from point of diversion to Rock Creek) eighty feet on the bottom, gradually narrowing to sixty feet on the bottom at Rock Creek. Slope of sides 2:1, depth of water ten feet, lower bank twelve feet on top; grade one foot to 5,000 feet, capacity three thousand second feet. From Rock Creek to terminus bottom width gradually narrowed from sixty feet to fifteen feet, slopes 1-1/2:1, grades increased to two feet to 5,000 feet at lower end. Rock Creek at head extends for one and one half miles estimated sixty percent solid rock, balance of canal in earth until last twenty miles, where it is estimated fifty percent of loose rock will be encountered." (15)

Other contract items included canal capacity, rights of way, water appropriations already granted, land applications and entries; water rights, price, dedication, and measurement; and duties of the Twin Falls Land and Water Company to complete and transfer the system. Governor F.W. Hunt and Secretary of State C.J. Bassett signed for the State of Idaho; Milner and Harrison E. Jenkins signed for the Twin Falls Land and Water Company. The actual re-organization of the Twin Falls Land and Water Company took place at Salt Lake City, January 14, 1903. On that date Milner transferred 62,500 shares of company stock to Buhl, leaving Milner 27,490 shares, Perrine, 10,000, and Knox, ten. Buhl transferred 10,000 shares to Filer. (16) On January 15, 1903, Perrine sold his remaining shares to Milner at \$6.50 per

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14 State of Idaho, Idaho Historical Library, MSS 114, Contracts and Documents

15 Ibid.

16 Ibid.

share. Milner paid \$1,000 down and the remaining \$64,000 settled by a promissory note signed that date. (17)

The reorganization left Buhl with 52.5% of stock, Milner with 37.49%, Filer with 10% and Knox with .01%. Buhl was named President; Milner, Vice President and member of the Board; Filer, Vice President and General Manager. Assistant Manager was Filer's friend, Mark Murtaugh, and Chief Engineer was another friend, Paul Bickel. Buhl's relative M.B. DeLong was the new secretary.

Mark Maurice Murtaugh was born April 19, 1870, at Bath, Pennsylvania, son of Bartholomew and Rachel Penrose Schnurman Murtaugh. He was educated at Hasbrouck Institute, Jersey City, New Jersey and was an engineer with the Central Railroad of New Jersey. From 1897-1899 he was contracting engineer for the roads of Long Island, New York. He was assistant engineer of the Oregon Short Line Railroad until accepting the assistant managership of the Twin Falls Company. When Buhl and Filer left the company so did Murtaugh. He spent the next two years in Rio de Janiero and Sao Paulo, Brazil, acting as engineer of a large electric power dam. He returned to the Twin Falls area in 1907. (18)

Paul S.A. Bickel was Chief Engineer of both the South and North Side Companies. It is said that no man knew the topography of Magic Valley as did Bickel. His field books are works of art, including some superb scaled drawings. Bickel became the first Mayor of Twin Falls; the first permanent local school was named after him. (19)

Martin B. DeLong was born at Utica, New York, in 1835. At the age of 68 he became secretary of the Twin Falls Company. He immediately took up a homestead and by June 11, 1903 had built a home which served the South Side Company as an on-the-site office, as well as housing the DeLongs and their daughter.

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17 Ibid.

18 French, History of Idaho, Vol. 3, p. 994, 995

19 Twin Falls News, Twin Falls, ID., 7 Feb., 1908, p. 7,  
col. 1

Mr. Buhl's partner in mining enterprises was Peter Lanterman Kimberly, born in Austintown, Ohio, January 5, 1846. (20) He moved with his parents when still young to Sharon, Pennsylvania. It was there that he met Buhl and the two became friends and business partners. Buhl contacted Kimberly as work at Milner began in earnest. Kimberly expressed interest and the two decided to found the Buhl-Kimberly Corporation, formed at Bridgeport, Connecticut, April 13, 1903. The amount of capital stock of the corporation was authorized at \$5,000,000 divided into fifty thousand shares at \$100.00 each. The three incorporators were well-known eastern investors, Ashley T. Cole, Richard F. McKiniry, and W.J. Bagnell, all of New York City. The purpose of the new corporation was to carry on the business of contractors for the construction of railways, gas, electric light and public and private utilities. (21) Kimberly's first trip to the Twin Falls Project greatly impressed him, but he died of apoplexy, June 4, 1905, three months after the opening of the South Side Canal. (22) His death resulted in probate of the Buhl-Kimberly Corporation, and caused the withdrawal (temporarily) of Buhl and (definitely) of Filer, Murtaugh and DeLong, the most knowledgeable officers of the system.

Over the three years between January 14, 1903, when Buhl and Filer took over the helm of the Twin Falls Company, and March 2, 1906, when the contract with Trowbridge and Niver was ratified and the system turned over to the latter, all major construction at Milner Dam and at major points on the canal system was completed.

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20 State of Illinois, Bureau of Vital Statistics, Death Certificate No. 12226

21 State of Idaho, Idaho Historical Library, MSS 114, Contracts and Documents, Buhl-Kimberly Corporation, Articles of Incorporation

22 State of Illinois, Bureau of Vital Statistics, Death Certificate No. 12226

## Chapter VI, The Construction of Milner Dam

Before contacts were let on the dam and canal system the company offices in Salt Lake City burned. Survey field notes, maps, survey plats and other data were destroyed in the fire. (1) Bickel and John Hayes headed a new survey to re-plat the south side. Beginning at the dam site, the surveyors made topographical blueprints of the area (see Photo ID-15-187) and topographs of the site with the dam drawn in (Photos ID-15-183, ID-15-192). More complete drawings, showing the survey of the dam, drawn to scale without topography, exist (Photos ID-15-153, ID-15-157).

Construction of the dam occurred sequentially: construction of a temporary power dam to divert water to a hydroelectric plant; construction of the south dam embankment; construction of the center dam and spillway, including a series of diversion tunnels; and construction of the north dam embankment. Construction of the canal occurred concurrently with dam construction. Closure of both the north embankment and the diversion tunnels occurred simultaneously in order to fill the reservoir and divert water into the canal.

Walter Filer, with another crew, completed the survey of the town of Milner and the proposed construction camp, (Photo ID-15-195). This blueprint is very comprehensive; not only does it show the plat of the townsite, but also shows the north dam in a more proper perspective than do the drawings in Photos ID-15-184 and ID-15-193. The print shows the placement of four cranes used to dump rock and dirt. On-site-generated electricity powered the crane system as well as much of the other equipment used in building the dam. The plans show a simple dam placed between the dam site and the already-constructed bridge to raise water about five feet forcing it into a power channel built along the south canyon wall. This canal, built by clearing away rock and debris in the canyon, conducted the stream (100 second feet) to a power plant platform.

Work was begun at the dam site in mid-March by Faris and Kesl construction company of Boise, Idaho. Faris-Kesl first built an 800-foot temporary dam of rock-filled cribs as a power dam. This dam was not intended to seal, but to raise the river to the necessary height by impeding water flow. Photo ID-15-175 shows the site of the temporary power dam before it was built. Milner

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1 Shoshone Journal, Shoshone, ID., 20 Feb., 1903, p. 1

Bridge is in the background. The Crawford Placer Mining water wheel is on the right and the center island is in the middle of the photo. The dam was built midway between the bridge and waterwheel. The dam itself proved to be a mass of cribs and debris in the main channel of the river. Photo ID-15-174 shows the channel before being dammed. The temporary north dam is shown in Photo ID-15-171 as the mass of wood and rocks in the foreground, with the rest of the dam a more regular wood and rock fill. Photo ID-15-178 is a view looking upstream at the face of the temporary construction dam.

The power flume extended along the south wall of the canyon. It was made by moving rock and debris to help form a channel. The river side of the channel was a framework of wood trussed by wooden uprights and supports and reinforced with piled rock (See Photo ID-15-75). Photo ID-15-69 shows the empty flume on March 1, 1905. The supports are iced over, but the structure of the channel is clear. Photo ID-15-163 shows the last 500 feet before the power house. A turbine wheel operated by the descent of the water 31 feet from point of channel entry drove a 200-kilowatt direct current generator. The lines seen in Photo ID-15-163 ran directly to crane 1 and throughout the system to an electric railway. (2) Photo ID-15-165 shows the four wooden cranes of the network. The north crane in the right foreground is weighted with rocks and has two cabins on it. The crane is shown preparing to dump a carload of rock. The railway is also shown as is an empty car at left with the transport rod for electrically powered motion clearly visible. An electric derrick shovel was used to hoist rocks of a square yard or more into the cars. (3)

As the first 25 miles of the canal were being constructed, work began on the dam. The three channels were worked on one channel at a time. The two southwesterly channels carried water only at high water, the main stream of the river ordinarily flowing in the north channel. The southwestern channel was the first to be filled. The southwest end of the dam abutted on lot 8 of the M.D. DeLong homestead and ran northeast to the main island. Although the Milner Dam profile (Photo ID-15-193) shows no cement trench in the plans, the 1903 blueprint of the south dam shows a shallow bed of concrete with a wooden core (Photo ID-15-185).

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2 Twin Falls News, Twin Falls, ID., 28 Oct., 1904, p. 1

3 Ibid., pp. 1,5

The porous nature of the river bed required that the bedrock be drilled down 29 feet to form a trench which was then filled with concrete. The concrete extended into the canyon wall and the southwest wall of Island 1. A double core of overlapping 2-inch planks was built, reinforced every two feet by uprights. The wooden core was built up to a height of approximately 35 feet.

(4) (Photo ID-15-166 shows the wooden core on the right and a car load of rock.) The planks were laid horizontally, overlapping both in length and width (See Photo ID-15-166). Rock was placed by hand against this core. Below and above the core the rock and dirt (mainly volcanic cinder) was carefully puddled with water. (5) The plans specified the upstream fill be earth directly against and sluiced into the rock fill on a ratio of 1 to 2; actual fill was more nearly 1 to 4 -- four feet of earth in width to each foot of dam height. Rock rip-rap strengthened the upper fill (Photo ID-15-176). The south embankment was 462 feet in length at the crest, bringing the elevation to 4,138 feet. (6) Photo ID-15-49 shows the southwest arm of the dam, partially hidden by the foreground, taken from the company house. Photo ID-15-58 shows the upstream earth fill and sluice work on the southwest dam.

Island 1, also called the South Island, formed a seemingly solid rock where two major elements of the dam could be constructed: the main spillway and a tunnel system to divert water from the north channel during construction of the north dam. A total of 8 tunnels were built for this purpose. This was the longest of the two islands used in the structure. Plans were made for a composite of 99 gates cemented to the top of the island for use as a spillway. The island was drilled and graded down to an elevation of 4122, about three feet above the canal bottom. The gate area was concreted, and a steel structure laid in the concrete to form the foundations into which the gate casings were fastened. (See Photo ID-15-191 for a blueprint of the gate structure, including cement base and casing dimensions.) The gates were made of 4-inch tongue and groove wood planking. Each gate measured 5 feet 5 inches by 10 feet. A gate raising mechanism (Photo ID-15-188) was bolted into the gate casing. This enabled the mechanism (Photo ID-15-197) to raise the gates

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4 Ibid., p. 5

5 Ibid.

6 Ibid.

using a threaded stem and gate lifting device (Photo ID-15-198) operated by meshing gears. Photo ID-15-55 shows the gates laterally, looking northeast. The island upstream has been leveled and the cranes are being dismantled. A downstream view of the spillway gates before closure of the dam shows the leveled island spillway as well as the cemented gate structures (Photo ID-15-56). A view of the island and gate system from upstream shows the wide leveled island area (Photo ID-15-57). The structure of the large wooden crane on the South Island is shown in a close-up (Photo ID-15-76).

Work on the tunnel system coincided with the progressive work on the total project. Begun in June 1903, the work was barely underway when the company held its first land drawing, July 1, 1903. (7) Publicity concerning the irrigation plans had been published nationally in The New York Times of March 29, 1903, but the major newspaper articles advertising the opening were published in the northwest, such as the Portland Oregonian, June 30, 1903, the Salt Lake Herald, same date, and the Boise, Idaho, Daily Statesman. Local newspapers, too, published reports of the proposed opening; Filer, Bickel and Buhl arrived in Shoshone to prepare for and attend it. (8) The Albion Times, Shoshone Journal, and other state and area papers kept account of the proceedings. The company had sent out thousands of single page tracts advertising the opening and describing the lands. The notice of opening describes the area, the duties of the company, and the cost to the person entering on the Carey Act segregation.

There were certain signs of growth in the town itself. The completion of the curved bridge across the Snake at Milner brought considerable travel to it. By early April, 1903, James E. Bower had set up a temporary hotel tent, a meat market, a store, and a feed lot. The company itself had a temporary office building, cook house, and a tool house, and the DeLong home was well under construction. The Faris and Kesl Company was laying foundation for a construction building, and Burton and Perrine had a large store under way. (9) The Albion Times also noted that 300 men with teams were already hard at work on the canals and that six engineering teams were busy, five surveying the

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7 Shoshone Journal, 26 June, 1903

8 Ibid.

9 Albion Times, Albion, ID., 2 April, 1903

canal lines and the other at the dam site. There was a demand for carpenters and canal laborers. The townsite platting was nearing completion and application had been made for a post office. (10)

The blueprints for the tunnels (Photo ID-15-190), show a planned cut in the northeast upstream face of Island 1. The depth of the cut was to be at least the depth of the north channel. The cut was made in a curve from the tunnel area to the north channel. An earth filled cofferdam was built above the construction area. A concrete wall about 15-feet high covered the 45-feet of cut island wall immediate to the tunnels. The tunnels themselves varied in both width and height.

As drilling and excavation of the tunnel progressed, the roof was stabilized by means of columns and I-bars. A close-up of tunnel work (Photo ID-15-168) shows a small corps of workers and clearly shows the bars and supports. As the cut continued, it hit a wide clay seam. This necessitated putting in thicker concrete side walls so the water action would not undermine the island structure. The projected center column and tunnel dividers were concreted. Concrete was poured from the top of the island through a wooden tube (Photo ID-15-173). The tube was directed at the tunnel level to the forms to be filled. The photograph shows the cofferdam, railway cars on the island above, and a scraper in the foreground.

Keeping the water from the working area proved to be a constant effort. In Filer's weekly report to Buhl, dated May 1, 1904, he writes, "It has been necessary to strengthen our dams to keep the water out of the open cut, which we have done today and unless we get something extraordinary will be able to take care of it for the next fifteen or twenty days, thus giving us ample time to complete our work in the open cut. The concrete work is not going as fast as it should owing to the limited crushing capacity. They have now two crushers working just for making concrete but are not able to keep up with the demands for the stone. . . . we are getting a very good grade of concrete. The gates are all set and tomorrow we should have all the outside concreting done up to the top of the gates. What will take more time is the two walls we are compelled to run out on each side of the open cut to protect the clay seam. We will first, however, complete all the

concrete work as fast as possible around the gates, leaving the open cut to be taken care of the last thing." (11)

The completed structure (Photo ID-15-182) shows the concreted approach to the tunnels. The photo is incorrectly dated, as it was obviously taken before the cofferdams were removed. C.R. Savage made a series of photographs showing the tunnels' work and closure. The Snake River surges from the tunnel outlet (Photo ID-15-48) in the early dawn of March 1, 1905. The water rushes into the tunnel as crowds gather to see the gates closed (Photo ID-15-50). On the Island above, the gates are prepared for closure. The rock in the right foreground is part of the middle dam (Photo ID-15-51). The officers of the Twin Falls Townsite and Investment Companies gather to wind down the gear system, (Photo ID-15-52), l. to r. Bickel, Milner, Filer and Critchlow. Other individuals in the photograph are unidentified.

The gates are closed and the rush ceases at the inlet of the tunnel (Photo ID-15-53). Later the water has backed into the reservoir and is creeping up to the gate level of the dam (Photo ID-15-54).

The first full water over Milner Dam (Photo ID-15-178), shows the rocky foreground middle dam. The DeLong Company House is in the rear. The arrow, drawn on this photograph at a later date, indicates the tunnel area.

After the dam tunnels were closed on March 1, 1905, official Twin Falls Land and Water Company photographer, C.R. Savage, took a series of photographs capturing the following events: Milner Reservoir rising behind the dam (Photo ID-15-45), the tunnel outlet, freed from the Snake Rivers flow, (Photo ID-15-61), the first water to breach the spillway (Photo ID-15-62), the waters spreading across the 487-foot wide spillway, (Photo ID-15-63), the water forcing its way from the reservoir (Photo ID-15-66), and finally, flooding over the spillway (Photo ID-15-64). Photo ID-15-62 shows more than the first trickle of water over the dam; it shows water flooding through the tunnel system, the first of many difficulties with this part of the structure.

The tunnels did not close properly, but after divers descended into the cut they located and removed a rail lodged in one of the

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11 State of Idaho, Idaho Historical Library, MSS 114, Filer Correspondence, filed under Murtaugh

gates. The second closing of the tunnel gates still failed to stop the flow entirely. A thin trickle of water continued coming through the tunnel even as water began to flow over the spillway (Photo ID-15-62). Further complications developed at the opening when the north dam failed. The gates were raised (Photo ID-15-59), to allow the full flow of the river through the tunnels lowering the reservoir by March 2 so work could commence on the north dam even as the canal was being opened. (12)

The middle dam is 404 feet long. The river bed pooled here after high water, so the area was closed off by cofferdams and pumped out to permit the same concrete trench base and extension into the north end of South Island and the south end of the North Island -- also termed Island 2 -- as had been used in the south dam. The wooden core was installed and the rock and earth fill placed, some by hand work and the rest by boxcars, cranes and dumpsters as shown in Photo ID-15-167. The fill work is beautifully photographed showing the extended earth fill (Photo ID-15-46) and the rock rip-rap strengthener. The rip-rap of the middle dam is in the foreground (Photo ID-15-47) showing the crowd at the 1905 dam closure.

In the left of the photograph can be seen the canal gates on the horizon level. While the north channel was being dammed, part of the middle fill was washed away by the tunnel channel overflow. This was corrected by sluicing wagonloads of earth into the water creating a seal. In Photo ID-15-74 the downstream face of the middle dam is shown from the river bed below the dam after the tunnels were closed.

A second spillway 290 feet long was planned for Island 2. This island projected well back into the reservoir. The top of the island was drilled and graded down somewhat lower than the south spillway, to be used in periods of high water flow or during repair of the gated spillway on Island 1. The island profile and gate plan (Photo ID-15-194) shows a concrete weir (waste weir) topped with stoplogs extending from the dam area back onto the island about forty feet. The concrete weir was gated so that water could be controlled to flow over the second island. The lower spillway was completed in 1908-1909.

The north dam caused more serious construction problems than did the other two. Filer's May 29, 1904 report to Buhl states, "On

the north side of the river and north channel we are doing nothing. Flooding our work in open cut . . . has done no particular damage . . . nor will it cause any particular delay in August when we start on the north dam . . . they have moved all the derricks from the north side of the river down to the rock cuts of what is known as the Taylor work (Photo ID-15-162)." The Taylor work, shown in Photo ID-15-162, drilled down the upper layer of rock from what was to become the North Side Canal. The leveling process graded the canyon wall down to what would be the high point of the north canal embankment as it winds along the canyon. The rock from the Taylor work was then brought to the north dam site and dumped into the river. The photograph shows the dumped rock at right, men and horses at work. It also shows at least three men swinging in the dumpster car over the channel. Photo ID-15-169 shows a work crew over the north channel with the town of Milner silhouetted against the horizon.

Construction of the 280-foot north embankment of the dam was started with rock work in June 1904. Two cofferdams of large rock were placed upstream and downstream of the north arm dam site. The cofferdams impeded the flow of the river and also forced it through the tunnels. The two windrows of rock, or cofferdams, checked the flow sufficiently to allow placement of cribs of rock along the dam line running straight north from Island 2. Because it was impossible to cut the water completely or to adequately pump the section dry between the cofferdams divers were employed to do the base work. They cleared the river bottom, placed the cribs, which were delivered by crane, and when the cribs were in place attached planking to the river bottom by means of concrete carried mixed and sacked by the divers. The wooden core, called an apron, was built as a single large unit and dropped into place by the cranes and cable system. (13)

After the wooden core was placed and concreted all water was forced through the tunnels and the dam completed with the regular rock and earth fill, the upstream slope being sluiced into the water.

Work on the north dam, also called the Channel Dam, presented a series of problems between early June and mid-November of 1904. Construction difficulties in crib placement, equipment failure, supply shortages and apron installation are detailed in a series of correspondences between Filer and Murtaugh during this period.

After this period of difficulty, the construction continued with few problems. The north side work included as part of the dam the North Side Canal headgates (Photo ID-15-43); the Taylor work of leveling the site of the first mile or so of the North Side Canal (Photo ID-15-44); and rock and earth fill upstream (Photo ID-15-37) and downstream (Photo ID-15-40).

Advertising had helped create an optimistic public attitude toward the project and a second opening of the land on October 20, 1904 had been a success. Major newspapers advertised the closure of the dam and a large crowd gathered for the opening of the south side system, March 1 and 2, 1905.

Telegrams to Buhl and Kimberly by-passed them and as a consequence they could not arrive in time for the closure of the dam. Filer had spent the last ten weeks on site, going home to Salt Lake on weekends. The week of the opening he telegraphed Mrs. Filer, "Impossible to be home this week. Sorry." When he returned to the dam in time to greet Buhl and Kimberly, the second closing was just being completed. (14)

Murtaugh was working with divers placing bags of concrete at the base of a gate that would not close properly. The two managers then started crews sluicing the earth fill into the rising water. During the night of March 1, 1905, the earth fill caved into the north dam and washed through the structure (Photo ID-15-41) laying a thick berm of silt on the downstream toe of the dam (Photo ID-15-73). Photo ID-15-42 shows the leveled Taylor work of the north side and the North Side Canal Gates, installed as a part of the dam. This photograph shows men and teams working on the face of the dam. The men and teams continued sluice work (Photo ID-15-38) as they repaired the cave-in (Photo ID-15-39). Milner Dam was able to hold back the Snake River, now flowing into the canal and over the spillway (Photo ID-15-65), tearing away the remaining Cedars which had been the islands' former distinction (Photo ID-15-67).

More recent photographs include: a panoramic view of Milner Reservoir and spillway, southeast view (Photo ID-15-138); a close-up of the spillway gates outlet (Photo ID-15-139); a panoramic view of the spillway inlet gates and the reservoir from upstream (Photo ID-15-143); a west close-up view of the inlet gates (Photo ID-15-144); the bridge over the spillway, showing

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the gate raising mechanism (Photo ID-15-146); a view showing the tunnel area as a thinly water covered area of the spillway (Photo ID-15-142); a south view of the spillway (Photo ID-15-145); a direct view into the spillway (Photo ID-15-140); and a panorama of the reservoir, the dam and the bridge area (Photo ID-15-135).

## Chapter VII, Summary of Major Repairs at Milner Dam

The information in this section has as its source the yearly reports on file in the offices of the Twin Falls Canal Company. It is literally impossible to record all the repairs on the dam and canal system since they continue on a day-to-day basis.

From March 2, 1905 to March 13, 1905 the loss of earth fill into the north embankment was repaired by sluicing cinders, earth, crushed rock and gravel into the cave-in. Sealed on March 13, the north dam required more gravel and other fill sluiced into the water. In order to begin work on the north fill, the tunnels were opened to lower the reservoir. At a low point, divers were sent into the tunnel; they reported damage to the tunnel walls. When the gates were closed again they wouldn't all close completely. Divers again took sacks of concrete to place at the tunnel gates. Some debris and earth fill was sluiced in. The gates seemed to seal satisfactorily.

In August 1909 an estimated 4,000 cubic yards of earth fill washed through the north dam. The embankment was repaired by building a cofferdam upstream from the cave-in. Workers then built an additional cutoff wall of 1-1/2 inch Fir shiplap 30-foot deep along the entire north embankment. They then replaced the earth fill. A 1912 report on the system (Photo ID-15-152) indicates no difficulties at Milner. In 1913 and again in 1915 a leak developed in the middle dam along the concrete abutment next to the spillway gates. In 1913 earth fill stopped the leak. In 1915 the embankment was excavated down to the South Island basalt. It was discovered that water had been leaking into the dam through the basalt; a concrete cap was placed on the basalt, and a concrete cutoff wall was built out from the South Island into the dam. An inspection of the wooden core made at this time showed it to be rotten in the upper four or five feet of the wall (to a depth of 9-10 feet below the crest).

The erosion of the South Island itself was apparent in 1913; the flow over the spillway was eroding the clay seam horizontal layer of the island. As the soil was washing away, the overlying basalt, unsupported, broke away into the river. The situation was monitored for three years. In late 1915 a consulting engineer was hired to make a report about the general conditions of the structure. His report focused on three major problems: spillway erosion; tunnel conditions; and the uncertain nature of the face earth fill. Major repair work was done by the South and North Side Canal Companies from 1916 through 1918. A tunnel was

excavated parallel to the spillway gates, through the clay seam. This tunnel was then filled with concrete to prevent further erosion. The tunnel walls of the original structure, (repair plans Photo ID-15-150), were repaired with concrete and the outside tunnels, which had been sealed with wooden doors, were completely plugged with concrete. The tunnel dividers were widened with concrete, and the tunnels themselves lined with concrete. To strengthen the earth fill, new wooden walls of sheet piling were driven down to a depth of ten feet. The pilings were then capped with a concrete wall.

Despite the repairs under the South Island, erosion continued to be a problem. By 1928, downstream erosion had exposed the concrete backfill. In 1933 the middle third of the spillway was repaired by pouring a concrete cap reinforced with steel mesh extending from the gates to the edge of the island and a reinforced concrete wall down the vertical falls area. The bottom edge of the concrete cap is tied into the concrete backfill constructed in 1916.

In 1928 one-half of the gate piers (every other pier) were replaced. The other half were replaced in 1949 and the dam top was increased in width so vehicles could drive over it.

Repairs completed to the tunnel system in 1918 did not convince the canal companies that it was an adequate structure; the tunnels have not been re-opened since March 2, 1905. In 1942 the tunnel outlets were blocked off by masonry rock walls to prevent possible sabotage. The rock walls have crumbled into heaps and it is possible, but foolhardy, to enter the tunnels from downstream. In 1950 the old tunnel gate operators were removed and the upstream open cut filled in to a depth of eleven feet.

In 1944, the north island (Island 2) spillway had to have extensive repairs. The gate system had deteriorated to a dangerous level. The canal companies decided that, as upstream regulation of Snake River had so improved since Milner Dam was built, this emergency spillway was not necessary. After three years of monitoring, the companies began construction of a concrete core dam (Plans Photo ID-15-195) with an earth embankment. A section of this 290-foot dam is four feet lower than the rest of the structure, serving as an emergency spillway.

No major construction has taken place at the dam since the tunnels were dismantled and the cut filled in 1950.

In March 1983, a cave-in and washout occurred in the middle dam. A cofferdam was constructed and the hole excavated down to rock fill; the area was then filled with truckloads of gravel and sand liberally mixed with clay. This fill was sluiced and puddled into the sink area. Lowering the reservoir by use of canals, the engineers noted that the fill was much broader than early drawing ratios had led them to believe. The wooden cores were also inspected and found rotted away.

It had originally been thought that water seeping into the south side soil would flow underground and be dispersed into the Snake River Canyon. Contrary to that belief, the walls of the canyon seem to be sealed through some geological process thus acting as impervious dams to prevent the escape of subterranean water.

The lack of drainage caused large surface areas to pool, souring not only the crops, but the soil itself. Data indicated need for further drainage by a more comprehensive subterranean system as additional acreage was brought under cultivation. The Twin Falls Canal Company has maintained such an expanding system. Some 40-acre tracts have as many as 150 wells and there are several miles of drainage lines and tunnels. There are no large seep areas.

### Chapter VIII, Twin Falls Main Canal Headgates

Survey of the Twin Falls Main, or South Side Canal was begun on March 18, 1903. The initial survey book shows that alignment was set after three observations of Polaris, March 16, 17, and 18 (Photos ID-15-155, ID-15-154). These observations were made by D.G. Martin, with W.E. Schluter, Candle Bearer. The first page of actual survey notes are drawn to scale on an opposite page (Photo ID-15-158) for the first stretch of the Main Canal, with the headgates aligned at the bottom of the page.

The canal headgates were drawn to scale by Paul S.A. Bickel (Photo ID-15-160) showing plans for nine headgates to be set in concrete on solid rock. The rock was to be graded and drilled down to a point about three feet lower than the base of the dam on South Island. The nine radial gates each measured 12-feet wide, with an 11-foot curved radial height.

The headgate piers were built by Faris and Kesl. Drills, rock crushers and concrete mixers were powered electrically. The reinforced concrete gate and dividers, with the new gates installed are shown in a south view (Photo ID-15-176) which also includes the rip-rap of the southwest dam and earth fill being unloaded from wagons. The gates are raised and lowered by hoists. Originally they were raised by a center cable branching in a Y to the sides. In 1906, during repairs to a broken cable, the original anchors were replaced with two bolt cable hooks and clamps. (1) The hoists for the radial gates were installed on a bridge work over the canal head (Photo ID-15-77). At the opening of the canal on March 2, 1905, the gates were given a final inspection (Photo ID-15-78) as Milner Reservoir rose behind them. Then the ceremony of the opening of the South Side tract was held. All the officers of the Twin Falls Land and Water Company, as well as the Townsite and Investment Companies, were there. Mrs. Elizabeth Ford Murtaugh poured a bottle of champagne into the first water allowed into the canal. The hoists were manned by officers of the company and its subsidiaries. Photo ID-15-79 shows the water entering the system while officials pose on the bridge. Mrs. Murtaugh, who lived at the Company House following the couple's marriage in 1904, still holds the champagne bottle.

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1 State of Idaho, Idaho Historical Library, MSS 114, R.W. Faris Correspondence

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Contemporary photographs show: a southwest, upstream view of the gates and hoists (Photo ID-15-91); a full-face view of the South Side Gates from downstream, looking north (Photo ID-15-137); two lateral views of the gates and piers (Photos ID-15-147, ID-15-149); and a close-up view of the radials and hoists (Photo ID-15-141).

There have been two major construction repairs of the canal gates. The first, of unknown date, closed a gate at either end, leaving small sluice gates in their place. The second, done in February and March, 1982, installed new concrete reinforcing walls and piers to support the radial gates.

Chapter IX, The South Side Main Canal, Dry Creek Reservoir and  
Point Spill

The Nelson Bennett Company of Tacoma, Washington, contracted to do the first 25 miles of the canal. Plans for the canal, as indicated in the 1900 preliminary segregation (Photo ID-15-198), indicate one single canal about sixty-five miles in length with laterals and drainage toward the canyon. The early surveys, begun in March 1903, showed need for a more complex network of canals and laterals to adequately irrigate the land segregated for the system. Changes in the channel were made again and again as the surveys indicated that a proposed line was too filled with obstacles to permit continuance. Several changes were made as the surveyors and managers worked out the final course of the Main Canal.

A waste gate with three large radial gates was installed 5,000 feet downstream as a practical means of flood control. Photo ID-15-80 shows Buhl standing on the bridgeway above the gates watching the water flow past him on its way to Dry Creek Reservoir, later known as Murtaugh Lake. The Waste gates were made of concrete piers into which the pins of the three 12 by 11 foot radials were placed. The canal varied in width from 80 to 120-feet at the bottom, with embankments on a 2 to 1 ratio. For every foot of height, the bank width is two feet. The height of the canal bank was about 12-feet. The canal was extended on a gravity flow base, maintaining the highest possible flow line so both the high and low land could be irrigated.

The distance from the canal gates to Murtaugh Reservoir was approximately nine miles. The Faris-Kesl electric railway was extended into the canal as excavation commenced. The drills and shovels shattered the rock. The large rocks were loaded into the small box-cars by means of a derrick. The material was taken to the dam site where it was used for fill. As work increased, more men and teams of horses were hired until there were about 500 men and almost as many teams of horses working the system at established points.

The construction camps were desolate places. Work progressed regardless of season or weather conditions. Camps sometimes held people of one ethnic background and were titled by such names as the "Dago Camp". Mostly they were full of hard working men who functioned together well (Photo ID-15-161). Bickel writes of the use in some camps of cocaine and excessive use of alcohol, although that was probably not the norm. Canal workers loaded

cars by pick and shovel or worked with a scraper and horses. Photo ID-15-164 shows a camp moving to a new location.

About nine miles below Milner Dam another dam one mile long and 48-feet high was erected along a natural depression made by Dry Creek (the present location of Murtaugh Lake). The proposed reservoir was surveyed in June, 1903 (Photo ID-15-186); it was felt a dam could hold about 8,000 acre feet at this point, which could be used in an emergency or for better regulation of the canal flow.

The dam is a rolled earth fill, with 15-percent moisture. It is 48-feet high in the lowest place in the draw, and one mile long. Water was essential in the dam construction as well as in the canal banks. Where the canals were built through lava ash soil, water served to harden the embankments, hence the reference to "puddling" seen so often in early records.

Two outlets were built. One was a small outlet to maintain Dry Creek's natural flow and for use as a reservoir regulatory gate. The canal outlet from the reservoir was a series of eight radial gates set in concrete piers with a bridgeway and hoist wheels. A lateral reservoir-side view (Photo ID-15-82) and a view of the gates from downstream (Photo ID-15-83) were taken before the hoists were installed. This dam had some leakage problems during construction as Dry Creek began its spring run-off in 1904. Sheet piling was driven by pneumatic hammer to shut off seepage (Photo ID-15-81).

Contemporary photographs of Murtaugh Lake show: the present dam structure with rip-rap (Photo ID-15-107); the dam and position of the headgates (Photo ID-15-105); the Dry Creek spill inlet (Photo ID-15-103); Dry Creek spill gates close-up (Photo ID-15-106); a lateral view of Dry Creek Spill (Photo ID-15-101); a full-face view of the Dry Creek outlet (Photo ID-15-104); the Murtaugh Lake Headgates, full face looking to the reservoir (Photo ID-15-100); an overall south view (Photo ID-15-108); and the Murtaugh Lake Headgates looking from the reservoir toward the radials (Photo ID-15-102).

The main Canal extends northwest almost to the Snake River Canyon (Photo ID-15-151) before turning back southwest toward the forks diversion. The most northerly section of canal is called the Shoestring (Photo ID-15-98). Here the Point Spill is located as an emergency spillway. The original spill is three radial gates set into cement piers (Photo ID-15-181). Contemporary

photographs include a lateral west view of gates and embankment (Photo ID-15-97) and a close-up of the radial gates at the outlet, south view (Photo ID-15-99). The Point Spill was installed as a regulatory device. It was thought unnecessary according to early system evaluations because the reservoir at Murtaugh was adequately regulated by the Dry Creek Spill. After being closed for many years it was brought into occasional use.

The Main Canal winds on another six miles, completing its journey at the Forks Diversion where it branches into the High Line and Low Line Canals. The Main Canal was built without culverts, but openings were left in the upper banks where drainage streams existed so the canals could carry away spring run-off.

Major construction has occurred at all sites. The Waste Gates, located about one mile below the canal headgates, have been closed off completely by filling in of the spill area. At Murtaugh Lake the two end gates were cemented in at an unknown date. The six remaining gates were temporarily strengthened in June, 1982, and in the fall of 1982 the gate system was completely replaced as was the regulating system called the Dry Creek Spill. The piers at the Point Spill have been strengthened and the hoist system replaced.

## Chapter X, Transfer of the System to the Twin Falls Canal Company

As early as March 1907, plans were underway to complete the system in compliance with State standards and to transfer it to the settlers.

In April, 1907, O.L. Waller of Washington State College made the first assessment of the structure of Milner Dam and the major structures along the south side system. The dam had tunnel problems and many of the canal piers were made of what appeared to be inferior concrete; the approaches to many spills and checks were not strong enough to withstand water scouring. The outlet at the Point Spill needed a firmer foundation or it would flood out the base of the concrete piers. Checks needed to be concrete, although the State Engineer had given Filer permission to use wood. There were other structures in need of strengthening and replacement. (1) Waller made another brief evaluation in August, 1907, with the same general recommendations to the State Land Board.

Necessary repair work was completed in the fall. That same fall a segregation was requested to water land east of Dry Creek by means of a pumping system. While this was under consideration, Buhl again urged that the canal be turned over to the settlers. Hays to Buhl ". . . in regard to the turning over of the canal; it may all be summed up this way . . . it would give the settlers too much control of the pumping plant operation, and it would also give them too much of an opportunity to attack us on the question of measuring devices and in cleaning out the coulees." (2) This letter also states that Perrine believed the High Line should be extended to take water over Salmon Falls Creek. Hays states his own intent to apply for further water rights on behalf of the company so the Twin Falls Land and Water Company would have reserve rights in case the project was feasible. Buhl approved the waiting period but suggested that the time would be well spent in completing the installation of measuring devices and in cleaning out the coulees.

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1 Waller, Report on Milner Dam and the South Side Canal System, Twin Falls Canal Company; April, 1907

2 State of Idaho, Idaho Historical Library, MSS 114, Hays Correspondence; 4 Dec., 1907

By that time the settlers had filed an injunction on December 16, 1907, to force specific completion of the system before it could be transferred to them. Work continued on the canal system and Milner Dam almost two more years before Voigt telegraphed Buhl that the settlers would make formal acceptance of the system on September 15, 1909. The Board of Directors of the Twin Falls Land and Water Company met at Hays' office in Boise, September 22, 1909, to draw up a resolution. Present were directors Buhl, Hays, and Milner, and Secretary Voigt.

The Twin Falls Canal Company incorporated September 25, 1909. Three days earlier, the State Land Board had approved the proposed Articles of Incorporation. Incorporators were Fred A. Voigt, Mark A. Coffin, H.O. Milner, and W.O. Taylor, all of Twin Falls, and the Twin Falls Land and Water Company, a Utah corporation. The capital stock of the corporation was set at \$240,000. Actual subscribed stock was one share at one dollar each to the four individual incorporators, one share to O.A. Milner, and 239,995 shares at \$239,995 to the Twin Falls Land and Water Company.

## Chapter XI, The Effect of the Canal System on the Magic Valley

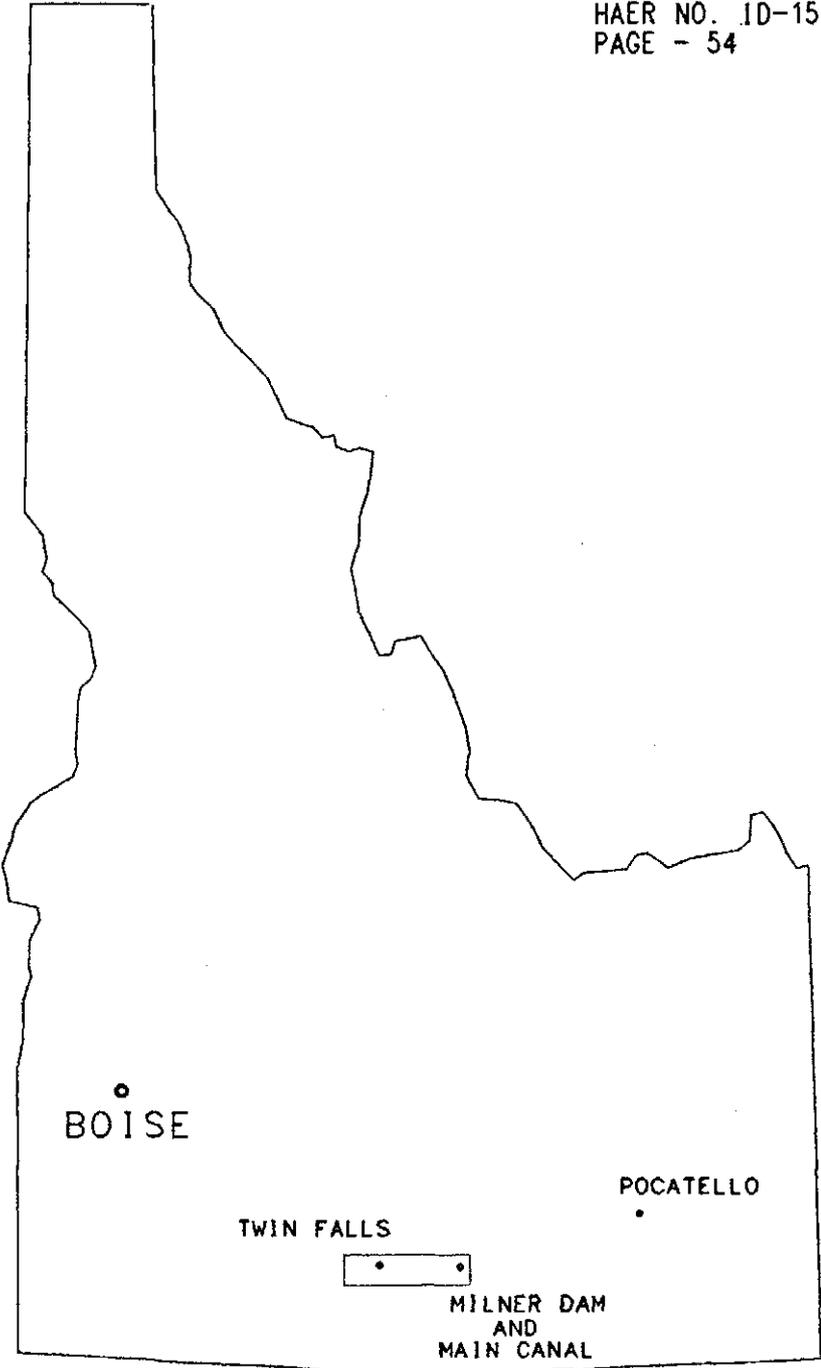
Immediately adjacent to the highest areas irrigated by the system lies desert as total as was the whole of Magic Valley before the construction of Milner Dam and the diversion of its reservoir waters through the Twin Falls canals and laterals. The effect of this Carey Act project on the lands served by Milner Dam and the Twin Falls Canal System is one of completely successful reclamation.

In 1909 the State of Idaho accepted the Twin Falls South Side Project as completed within the terms of its contract. One year later the project was turned over to the settlers' operating company, the Twin Falls Canal Company. Included in this transfer were the remaining unsold shares of stock held by the construction company. In the early 1920's the company concluded the project by relinquishing unusable lands. By 1932 the project was operating efficiently except for some seepage problems and some reconstruction on the Milner Dam.

From the standpoint of the settlers, the construction company and the State, this project was termed a success. One of the most important contributions of the project was that it proved that reclamation was feasible on a wide scale. The success of this project spurred additional Carey Act development in the State of Idaho.

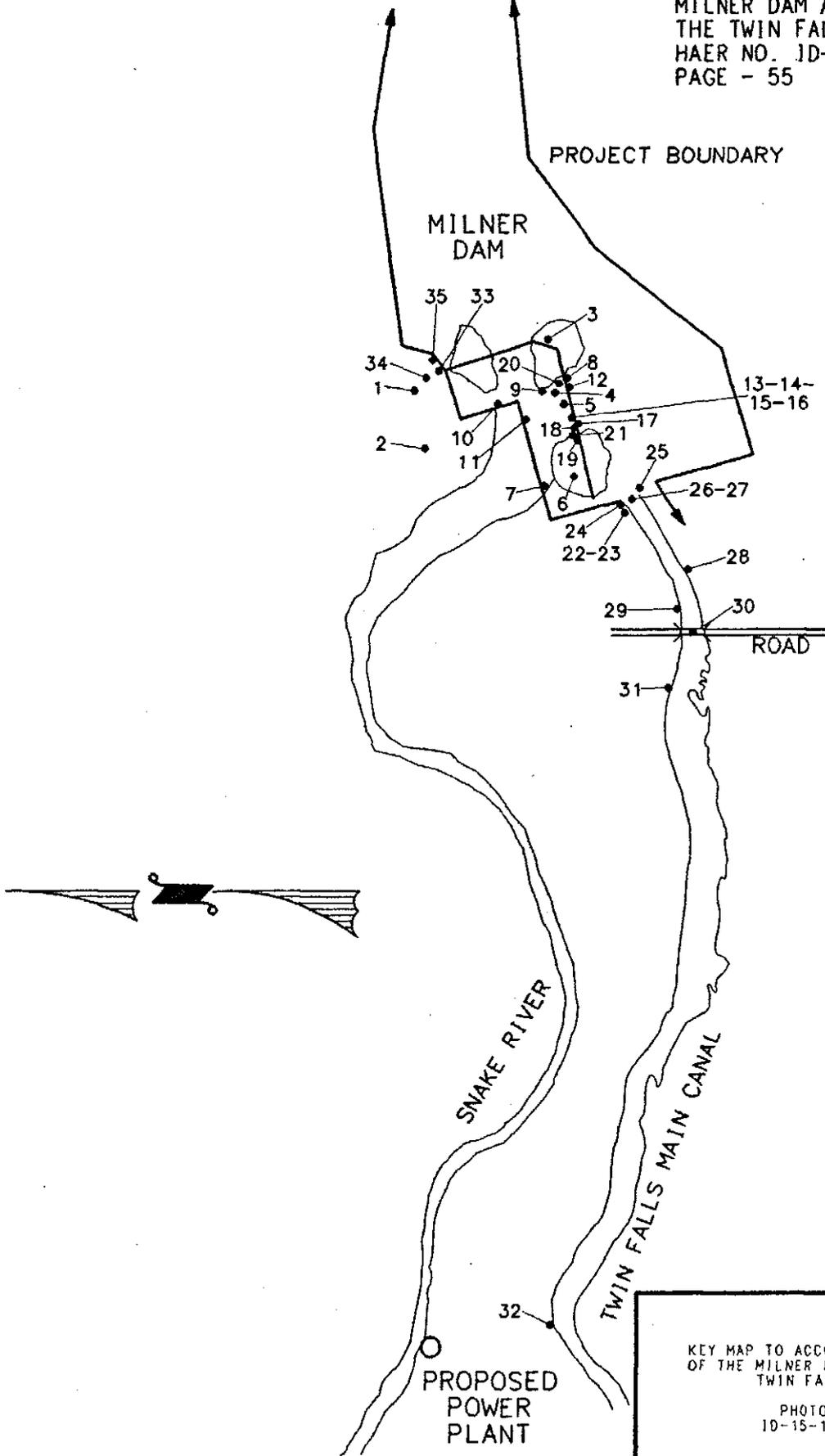
The project resulted in the reclamation of a total of 192,750 acres of arid lands. These lands remain under cultivation and contribute heavily to the economic well being of Twin Falls County and the State.

Several communities were established and prospered as a result of the project. Some of these were named after the developers of it. These include the towns of Buhl, Kimberly, Burley and Murtaugh. It also contributed substantially to the growth and continued well being of the city of Twin Falls. All of these communities are dependent upon the agricultural development of desert lands as a result of this successful Carey Act project. Crops grown vary from year-to-year, depending on market and growing conditions and the judgement of individual farmers. Generally, seed bean, barley, sugar beets and potatoes comprise the bulk of crops. Being one of the largest producers of seed bean, the Magic Valley contributes substantially to the world market.



**FIGURE 1**  
LOCATION MAP  
MILNER DAM  
&  
THE MAIN CANAL OF THE  
TWIN FALLS CANAL COMPANY  
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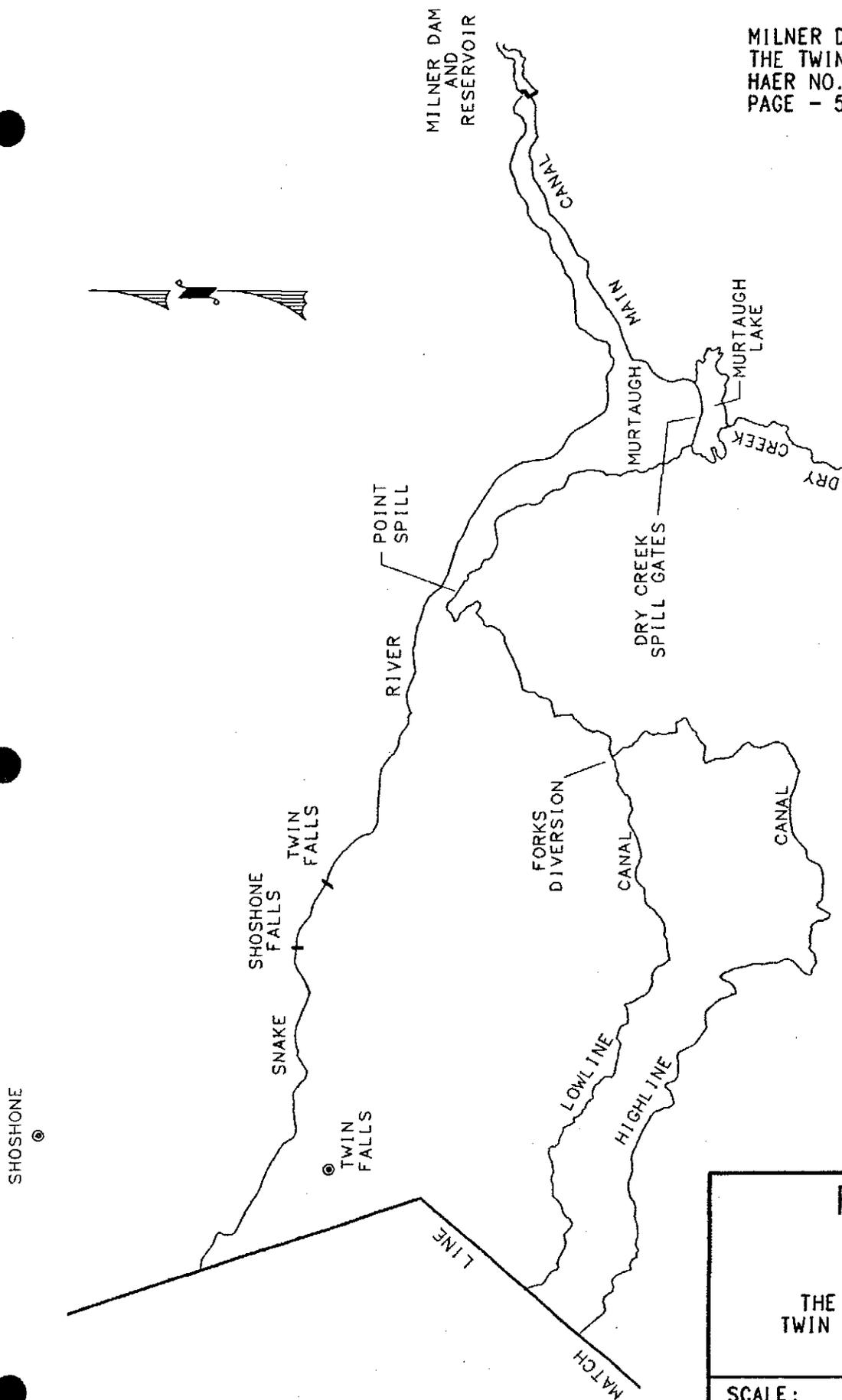
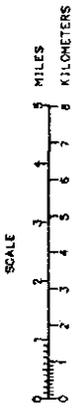
KEY MAP TO ACCOMPANY PHOTOGRAPHIC INDEX  
OF THE MILNER DAM AND MAIN CANAL OF THE  
TWIN FALLS CANAL COMPANY.

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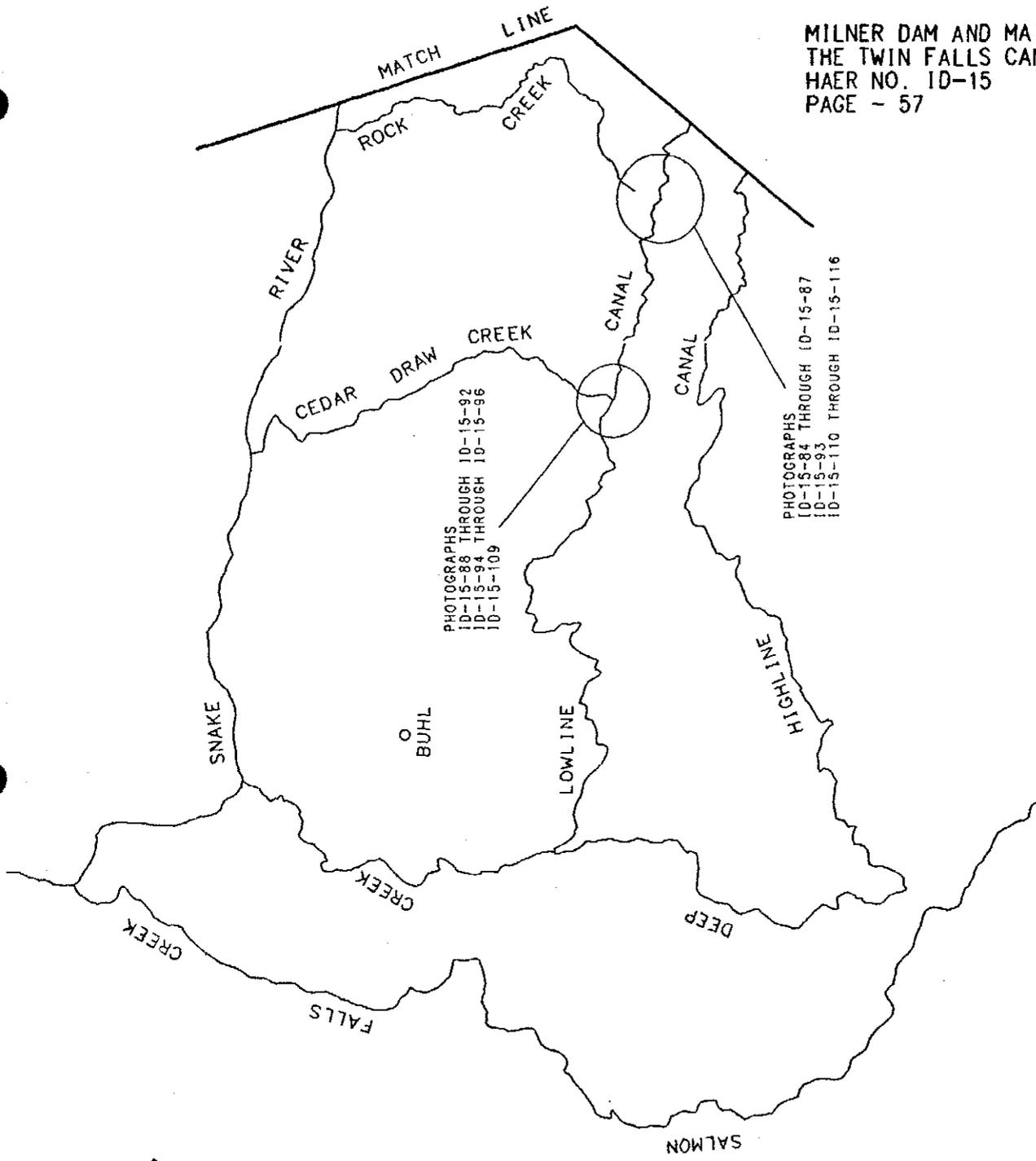
CAD-A-608 MILNER MAP



**FIGURE 2**  
 LOCATION MAP  
 MILNER DAM  
 &  
 THE MAIN CANAL OF THE  
 TWIN FALLS CANAL COMPANY  
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1 OF 2	CAD-A-638 MILNER

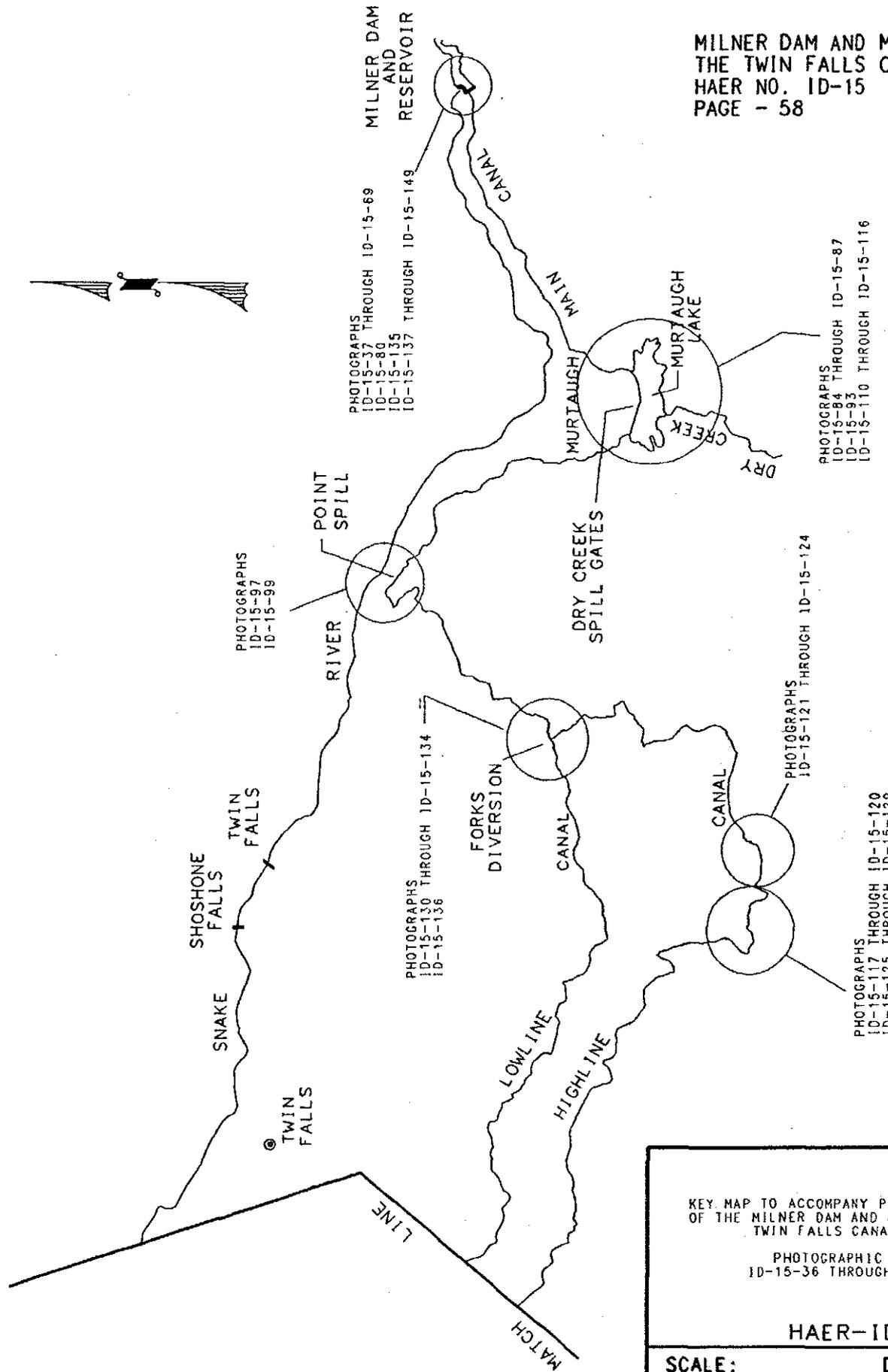
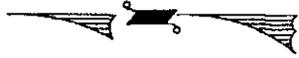
MILNER DAM AND MAIN CANAL OF THE TWIN FALLS CANAL COMPANY  
HAER NO. ID-15  
PAGE - 57



**FIGURE 2**  
 LOCATION MAP  
 MILNER DAM  
 &  
 THE MAIN CANAL OF THE  
 TWIN FALLS CANAL COMPANY  
 HAER-ID-15

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MILNER DAM AND MAIN CANAL OF  
THE TWIN FALLS CANAL COMPANY  
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PHOTOGRAPHS  
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ID-15-80  
ID-15-135  
ID-15-137 THROUGH ID-15-149

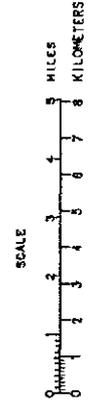
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ID-15-93  
ID-15-110 THROUGH ID-15-116

PHOTOGRAPHS  
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PHOTOGRAPHS  
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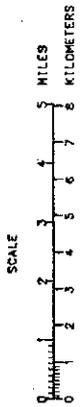
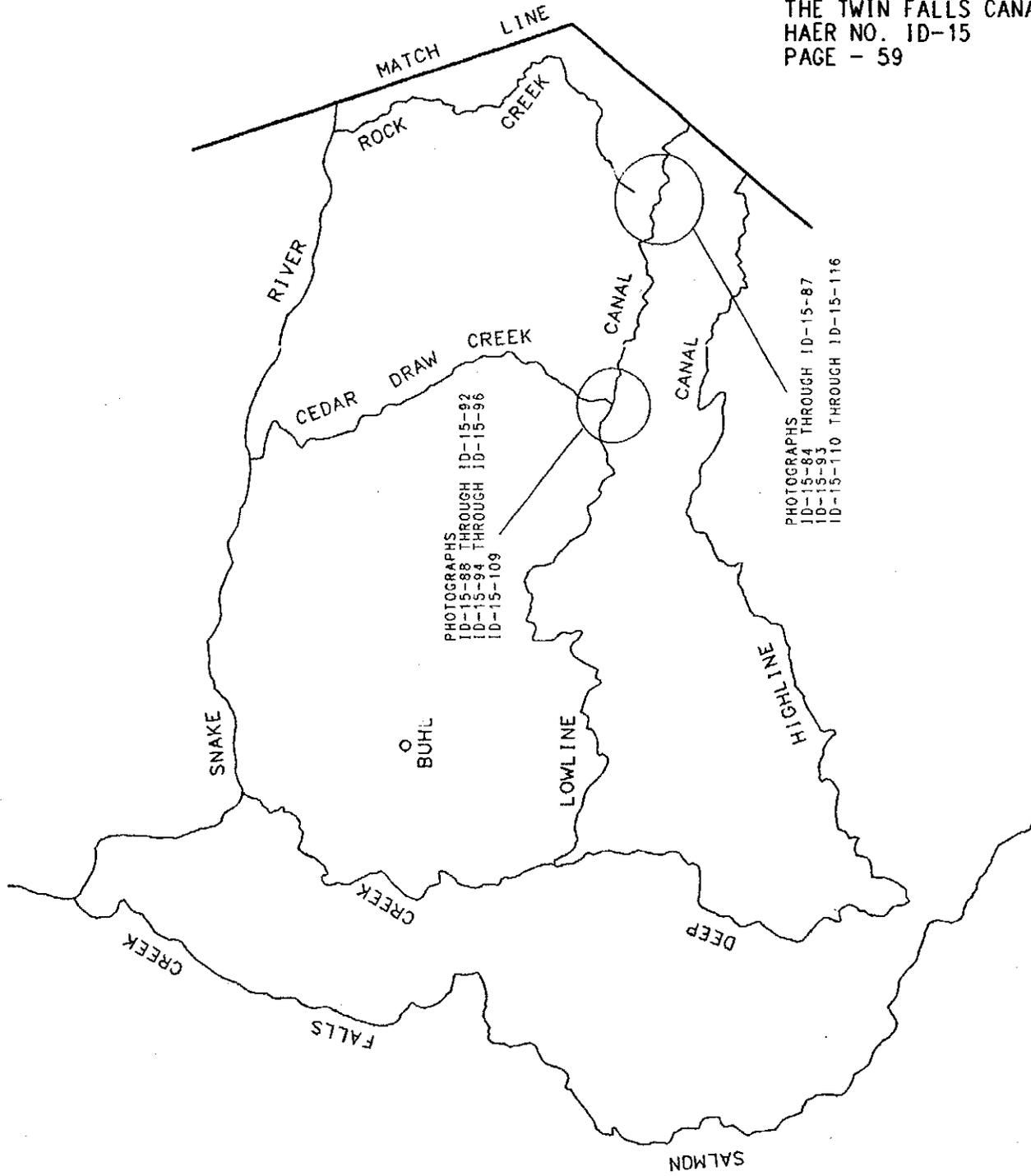
KEY MAP TO ACCOMPANY PHOTOGRAPHIC INDEX  
OF THE MILNER DAM AND MAIN CANAL OF THE  
TWIN FALLS CANAL COMPANY.

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KEY MAP TO ACCOMPANY PHOTOGRAPHIC INDEX  
OF THE MILNER DAM AND MAIN CANAL OF THE  
TWIN FALLS CANAL COMPANY.

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2 OF 2

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MILNER DAM AND MAIN CANAL OF  
THE TWIN FALLS CANAL COMPANY  
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APPENDIX

Other Carey Act Projects in Idaho

In addition to the Twin Falls South Side Project, there were three major Carey Act projects in the Twin Falls area. To place the developments in each project in the proper perspective the three projects have been considered together. It was in the Twin Falls area that the Carey Act realized its greatest success in the State of Idaho and it was here that it realized many of its failures. The total acreage patented to individuals through these four projects represents the largest privately constructed reclamation project in the United States

#### THE MULLINS PROPOSAL

The first proposal in the area was made by the Mullins Canal and Reservoir Company sometime in 1899. The proposal was for 6,543.26 acres and would cost \$100,000 to build. Reservoirs were planned to store water on the Snake River with canals and laterals constructed to carry water to the surrounding areas. The lands to be reclaimed were on the north side of the Snake River near the present town of Hagerman. The proposal was accepted by the State and construction was started by the Mullins Canal and Reservoir Company.

#### THE KUHN PROJECTS

The Kuhns of Pittsburgh were wealthy brothers who owned train lines, municipal water lines, electric car interests, and were associated with the American Water Works and Guarantee Company of Pittsburgh. As soon as word reached the East of the success of the Twin Falls South Side Project the Kuhns began making plans to start their own projects in the surrounding area. Many of the men connected with the successful south side project were solicited by the promoters. (1)

The Kuhns immediately started selecting and making the necessary arrangements to secure land for the project. They finally decided on developing three separate tracts as three separate projects. The first contacts made in Idaho by the Kuhns were with the Twin Falls Land and Water Company. The Kuhns were already acquainted with most of these men and many of them had already become deeply involved in the newly proposed projects. Negotiations were started in 1907 and by April an agreement had

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1 I.P. Perrine and H.L. Hollister were connected with the Twin Falls South Side Project and soon became the directors of the Twin Falls Salmon River Project.

been reached whereby all the rights, title and interest that the Twin Falls Land and Water Company had in lands lying on the north side of the Snake River were conveyed to W.S. Kuhn and his associates. This was known as the first segregation amounting to 30,000 acres and marked the beginning of the Twin Falls North Side Project.

In August of 1907 the second project was started by the Kuhns. This project was located in Twin Falls County on the Salmon Falls Creek drainage. In January of 1908 segregation list 14 was filed for 125,979.29 acres.

On June 15, 1908 another proposal was filed by the Kuhn Brothers, this time for lands lying in Cassia County, near the present town of Oakley. The water supply for this project was Goose Creek and the surrounding drainage. Three days after the proposal 43,573.56 acres were segregated for the Twin Falls Oakley Project. (2)

In approximately 15 months the Kuhns had started three Carey Act projects and segregated 199,552.85 acres of desert land. Every company started by the Kuhns and all of their projects adopted the name "Twin Falls," hoping to capture some of the success and reputation the Twin Falls South Side Project had generated around the United States. Due to their different locations and water supply, the three projects did not develop along parallel lines, instead, the degree of success obtained by each of the projects is quite varied.

#### THE TWIN FALLS NORTH SIDE PROJECT

Much time on this project was spent obtaining more land than was included in the original segregation of 30,000 acres. For their first segregation the company planned construction of three storage reservoirs on the north side to retain water for the project. Construction was started on the Jerome Reservoir which, it was hoped, would be the main source of storage.

Rather than filing on a new segregation the Kuhns began negotiation with the Mullin's Project which had been stagnating due to financial and construction problems. After the negotiations were completed and additional segregations were granted the project amounted to over 200,000 acres.

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2 Later, in 1916, an additional 320 acres were segregated.

In order to finance this project a bond issue of \$5,000,000 was authorized, to be secured by a deposit of contracts for the sale of water rights in the proposed irrigation system. The bonds were also guaranteed by the American Water Works and Guarantee Company of Pittsburgh. Investment companies were formed by the various promoters in an effort to capitalize on the nearby Carey Act projects. The purpose of these companies was to secure townsites, generally state school sections or scrip land, and then subdivide the land into commercial lots. Thus small towns in the area still bear the names of many of these promoters. These early investment companies also owned the town utilities and transportation lines. It was here that the promoters made their profits.

The irrigation system was to be built pursuant to contracts with the State of Idaho, which called for the construction of over 700 miles of main canals and laterals of certain required capacities, two reservoirs, and acquiring of a joint interest in the diversion dam on the Snake River at Milner, Idaho.

The first problem developed over the two reservoirs constructed by the company for \$600,000. They were miserable failures; the largest of the two, Jerome Reservoir, wouldn't discharge with the reservoir below a certain depth; the large area behind the dam required a canal be constructed on the reservoir's bottom. Another problem was the large losses due to ground seepage.

In 1913, at the demand of the State, the company contracted with the United States Reclamation Service for the enlargement of the Jackson Lake Reservoir. As long as the company was able to obtain the necessary credit to make payments to the government to pursue construction things looked promising; however, this was not the case. In July, 1913, the American Water Works and Guarantee Company and one hundred other subsidiary corporations failed. The failure so involved the Twin Falls North Side Land and Water Company that it was impossible for it to meet the maturing interest or principal of its outstanding bonds (now totalling \$3,700,000), to complete its several contracts with the State of Idaho, or to make the payments due the government on the Jackson Lake enlargement. Soon after this a Bondholders' Protective Committee was formed. The government ceased work on the Jackson, Wyoming enlargement project, and without the prospect of water the project ground to a halt. Damage claims for short water deliveries totalling over \$200,000 were soon instigated by water users.

It was at this point that the man credited with saving the project appeared, R.E. Sheppard, who soon became manager of the project. Through consolidation of the land area and through cooperation of all parties involved, work soon resumed on the project. The Federal Government agreed to commence construction on the Wyoming Project. By 1921, 125,500 acres were in cultivation including 10,100 acres reclaimed by the Milner Pumping Project that had been started by the Twin Falls North Side Project. A court decision, Twin Falls Canal Company v. Chas. N. Foster, set the water supply for the project and as a result a contract was reached between the construction company, the State and the settlers, whereby they agreed to limit the project to 185,000 acres. At the completion of the project 100 miles of main canal had been constructed and 800 miles of laterals. In 1920 the works were turned over to the operating company, the North Side Canal Company.

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