

DESCHUTES IRRIGATION AND POWER COMPANY CANAL  
(Central Oregon Irrigation Canal)  
South Division St. vicinity  
Bend  
Deschutes County  
Oregon

HAER No. OR-63

HAER  
ORE  
9-BEND  
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
Columbia Cascades Support Office  
National Park Service  
909 First Avenue  
Seattle, Washington 98104-1060

HISTORIC AMERICAN ENGINEERING RECORD

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**Location:** Deschutes River, near South Division Street  
Bend  
Deschutes County  
Oregon

USGS Bend Quadrangle, Universal Transverse Mercator  
Coordinates: 10.635297.4876951

**Date of Construction:** 1904-1905

**Engineer:** Levi D. Wiest, Irrigation Engineer

**Builder:** Deschutes Irrigation and Power Company

**Present Owner:** Central Oregon Irrigation District  
847 S.W. 6th  
Redmond, Oregon 97756

**Present Use:** Irrigation Facility

**Significance:** The Deschutes Irrigation and Power (D.I.P.) Company Canal is significant as a component of the first large-scale irrigation project in Central Oregon. Built by the Deschutes Irrigation and Power Company, the canal was one of two early irrigation facilities constructed to irrigate desert land for prospective settlers in the central Oregon region in the early twentieth century. This initial canal system was instrumental in the establishment of the city of Bend, Oregon and its surrounding communities. Because of the size of the D.I.P. Canal project and the necessity of constructing it in an area of solid basalt subsurface conditions, the surveying, construction and operation of the D.I.P. Canal were substantial engineering feats for the period. The canal is also significant for its association with the Deschutes Irrigation and Power Company (D.I.P.), later the Central Oregon Irrigation (C.O.I.) Company/District. The D.I.P./C.O.I. was of major significance in the development of irrigation systems in Central Oregon. The company was responsible for the founding of the city of Redmond, Oregon, and its canals served more acreage of agricultural lands than all the other early irrigation companies in the region. The

D.I.P./C.O.I. canals remained the largest irrigation system in Central Oregon until the North Unit Main Canal was completed by the U.S. Bureau of Reclamation in the early 1940s.

**Report Prepared By:** Oregon Department of Transportation

**Date:** May 26, 1998

## I. DESCRIPTION

The Deschutes Irrigation and Power (D.I.P.) Co. Canal is a broad, shallow channel that carries Deschutes River water east and north from a diversion point 4.5 miles south of the city of Bend, Oregon in Deschutes County (**Fig.1**). It is an earth walled construction of 1904-1905, extending approximately 47 miles with an approximate width of 50 feet and a depth of three feet. The canal is uncovered and unlined and has a canal maintenance road (or ditchrider's road) running parallel along its north side.

The D.I.P. Canal is in good condition and retains its original function as an irrigation channel serving 36,378 acres of arable land in the vicinity of Bend. The canal is maintained by its present owner, the Central Oregon Irrigation District. Associated features include a concrete headgate structure with radial gates near river mile 171 on the Deschutes River; the abandoned Dry Canyon Flume, located near Powell Butte in Crook County; and the Pilot Butte Canal, which is now a lateral of the D.I.P. (C.O.I.) Canal (**HAER No. OR-62**). Also included is a concrete diversion headwall and waterman canal gate located at the point of the Pilot Butte Canal's diversion from the D.I.P. Canal.

The entire length of the Deschutes Irrigation and Power Co. Canal has not been examined. However, the section of the resource located within the Bend Parkway project area appears representative of the resource, including integrity of location, design, and construction.

## II. HISTORIC CONTEXT

### Early Irrigation in Oregon

According to Corning's Dictionary of Oregon History (2nd Edition 1989), small scale irrigation for agriculture began in Oregon in 1852 when Jacob Wayner and a man named Thornton constructed what was probably the first irrigation ditch in Oregon on the Rogue River near the present-day community of Talent. In 1857-58, the Courtney brothers dug irrigation ditches across the Umatilla Meadows near Henniston. In the 1850s, a narrow 15-mile diversion ditch carried the waters of Mill Creek, near The Dalles, to the agricultural lands of Wasco County. Early Baker County residents recall that ditches such as the Eldorado Ditch, dug for placer mining in the area during the 1870s, were continued in use for irrigation after the gold was mined and agricultural pursuits had begun.

As early as 1877, private investment in central and eastern Oregon was encouraged by Congress through the Desert Land Act, which provided for the sale of lands in units of 640 acres at \$1.25 an acre. The act enabled settlers to acquire their holdings provided they irrigated them within three years. A further incentive was the Carey Act of 1894, which gave Oregon a million acres of desert land, with grants to individuals of 160 acres.

The Carey Act represented a transition from total reliance on private irrigation development in the 19th century to 20th-century practice in which the federal government took almost total responsibility for some irrigation developments. Under the Carey Act, western states were encouraged to organize large-scale irrigation projects by finding private entrepreneurs to build the necessary dams and canals, and by selling land to settlers who would in turn purchase water from the private developers. Although private investors found western irrigation attractive, sufficient capital could not be attracted to undertake most projects (Quivik and Hess 1989).

One of the state's earliest cooperative irrigation projects was begun around 1900 in Hood River to serve fruit growers. In 1902, by authority of the Federal Reclamation Act of that year, the Umatilla project was established. This irrigation system was built from 1904 to 1908, and included an area of 17,000 acres along the south bank of the Columbia River, east of the Umatilla River. Water for irrigation of 10,000 acres was diverted from the Umatilla near the town of Echo, and stored in the Cold Springs Reservoir, 24.5 miles to the north.

The Federal Reclamation Act also authorized the Klamath irrigation project, with work starting in 1903 to serve portions of the Klamath Basin. In 1904, the Deschutes Irrigation and Power Company, through the Pilot Butte Canal, brought water to arable acres in the evolving city of Bend in central Oregon. Similar developments were the Hermiston (1921) Owyhee (1926), Bumt River Valley (1938), Stanfield (1933-1935) and Vale (1926) projects, and a larger Owyhee project and dam (1938) (Coming 1989). Although a 1914 report listed a total of 1,000,000 acres within irrigation projects, a 1930 survey indicated 898,713 acres actually irrigated in cooperative, private, and Federal and local irrigation districts.

### **Irrigation Development in the Bend Area**

Early settlers were not initially attracted to the Deschutes Basin, choosing instead more promising land with heavier rainfall west of the Cascade Mountains. The first agricultural use of the Deschutes Basin was for cattle grazing. The basin's open range was grazed by local stockmen who began settling in the area around 1870, and by established ranchers from the Willamette Valley who used the Deschutes for summer range. Some of the early settlers also began small-scale irrigation. In the 1880s, transcontinental railroads brought sheepmen and a few farmers who competed with cattlemen for use of the land. Stands of timber along the eastern front of the Cascades attracted loggers and several sawmill operators. Yet, by the turn of the 20th century, the Deschutes Basin was still largely undeveloped for uses other than stock grazing (Quivik and Hess 1989).

The availability of irrigation played a significant role in the early development of Bend and settlement in the surrounding communities. The formation of irrigation districts, the damming the Deschutes River and the building of canals were events that shaped and continue to affect Central Oregon. The Deschutes River Basin is about 75 miles long and 30 miles wide. The Deschutes River and its tributaries drain about 9,000 square miles. Mean annual precipitation of Bend is about 12 inches, which falls primarily as snow in the winter months. As the growing season is short, irrigation is essential for successful farming in this arid, high desert area.

The General Land Office divided the Deschutes River Basin into two units. These units are important in understanding the names of some of the later canal systems. The first developed was the South Unit, on the upper Deschutes River in Deschutes County. The North Unit, downstream of the Crooked River Canyon in present Jefferson County, was developed last.

Long before Deschutes water transformed thousands of acres in Central Oregon through a system of canals, irrigation was practiced on a very small scale in the present Bend area. Diverted through ditches that did not reach far from the river edge, water was used to irrigate gardens for the few ranches that bordered the river, and to cultivate small tracts of alfalfa.

The earliest filing of water rights on record for the Deschutes River was that of the Cline Falls Power Company in January 1892, although the enterprise intended to provide hydroelectric energy rather than water for irrigation. Probably the first diversion of Deschutes water for irrigation purposes in the Bend area occurred before 1893 on the "Dutch John" Felderworst homestead. Located on the east bank of the Deschutes upstream from the site where central Bend was to evolve and near where the Brooks-Scanlon Lumber mill began operation in 1915, Felderworst is believed to have been the first farmer to grow alfalfa in the immediate vicinity of the Bend townsite. On his place about a mile upriver, he cleared a small parcel of bottomland, built the canal that for years was known as the "Dutch John" ditch and grew alfalfa for several seasons.

Private irrigation was also practiced on a small scale on the W.H. Staats property. Water was taken from the Deschutes by bucket mill, which dumped the water into small ditches for Mrs. Staats' carefully cultivated garden. That garden, not far from the Deschutes channel, provided fresh vegetables for many years for stockmen on their way to and from mountain ranges in the late spring and early fall. At one time, the Staats's bucket irrigation system apparently supplied water to 10 or 12 acres. Just upstream, and also on the east side of the river, John Sisemore had a small ditch on his Farewell Bend ranch (Bend Bulletin 1953).

In 1893 organized irrigation began with the incorporation of the Three Sisters Irrigation Ditch Company, which designed a canal system to distribute and sell water from Tumalo Creek to farmers just north of present-day Bend. In 1895, construction began on the Squaw Creek Irrigation Company's canal, and around 1900, other local, private irrigation companies began surveying the area for potential irrigation projects. Charles C. Hutchinson formed the Oregon Development Company in 1898 and filed on Deschutes water that spring. The Deschutes Reclamation and Irrigation Company (commonly called the Swalley), formed by Jim Benham, George W. Swalley, and others, was also incorporated in 1898. In 1902 the Pilot Butte Development Company entered into a contract with the State of Oregon for the reclamation of lands under the terms of the Carey Act. The Arnold Irrigation Company incorporated in 1904, followed by the North Irrigation Company in 1908.

Very little water from the Deschutes River was diverted until Alexander M. Drake arrived in central Oregon in 1900. Drake purchased land, built a lodge and started the task of creating the town of Bend. (Bend was platted in 1904 and officially incorporated in January 1905.) After his

summer lodge was finished in 1900 on the eastern bank of the Deschutes, downstream from the Staats and Sisemore properties, Drake constructed three pumping plants. One of these was at Staats; one was just below the present Tumalo Avenue Bridge and one a little further downstream. It was the third plant that supplied water to the Drake lodge. Because of ready supply of water, Drake's lodge was equipped with a bath, a novelty in central Oregon at the time. Drake was also instrumental in the founding of the Pilot Butte Development Company which competed with Hutchinson's Oregon Irrigation Company for several years, until both companies sold to the Deschutes Irrigation and Power Company in 1904 (Clark 1985).

Water from the Deschutes also provided irrigation for "Garden Row," the residential section that was home to many of Bend's most influential citizens. These properties, with their fine gardens and occasional lawn, were located between the present-day Tumalo Avenue and Drake Park bridges on the east side of the river (Bend Bulletin 1953).

The initial flurry of irrigation activity in the Bend area occurred from about 1904 to the mid-1910s. In July 1904 the Deschutes Irrigation and Power Company project began large-scale construction, building flumes and canals north and east. From the diversion point on the Deschutes, two main canals were designed. One, the D.I.P. Canal (later the Central Oregon Irrigation Canal), ran northeast toward the west side of Powell Butte. The other, the Pilot Butte Canal pointed north toward Redmond. Drake and Hutchinson's companies sold to the Deschutes Irrigation and Power Company in 1904, which subsequently became the Central Oregon Irrigation Company in 1910. The Arnold Irrigation Company eventually absorbed the North Irrigation Company and others. By the 1930s, several other companies in the Deschutes Basin had also reorganized as irrigation districts.

The next major irrigation project, the North Unit Main or Deschutes Project, was not dedicated until 1946, although work had begun years earlier. This major canal, 65 miles long, originates in Bend but carries water to Jefferson County. Eventually Deschutes water would find its way into six irrigation systems: the Swalley, Central Oregon Irrigation District, North Unit, Lone Pine, Arnold and Tumalo. According to data compiled by the State Water Resources Department on the Deschutes Drainage Basin (1978), Deschutes County had 58,540 irrigated agricultural acres (out of a total 1,785,302 acres).

### **Canal Construction Technology**

The early Deschutes Irrigation and Power Company canals were built by hand and horse labor. Much of the excavation was done with horse-drawn scrapers. In areas of rock (typically early Pleistocene lava flows), sledgehammers were applied to steel miner's drills to bore holes for blasting charges. After fuses - and later, detonators - had set off the blast, crews removed the loosened rock and shoveled and scraped the canal to grade and depth (Clark, Lecture Notes n.d.).

In November 1904, the Deschutes Irrigation and Power Company improved conditions for its employees by purchasing two portable steam boilers, which were shipped from Columbus, Ohio. One boiler was twenty horsepower, the other six; both were to furnish power for operating rock

drills. The larger boiler drove four drills; the smaller, one. Together they could bore 400 feet a day in lava rock, where ordinarily a rock crew of three men could bore only 18 or 20 feet a day. In September, about 50 Italian laborers were brought in to work on the project, bringing the company's work force to 200 men and 100 teams (Vaughan 1981).

Early irrigation in Central Oregon was facilitated by gravity systems. These systems derived their water supply by diversion of a river or stream, then conveyed the water in a network of canals or channels to the land to be irrigated. The diversion raised the water level to force the desired flow through a headgate into the head of a canal. This was usually accomplished by a diversion dam, or weir, across the watercourse. The character and cost of construction was determined by the topography. Hillsides too steep for open canal excavation required fluming supported on benches cut in the hillside, or a concrete rectangular section made with a retaining wall on the downhill side. Depressions were crossed with flumes or siphons. Ridges were tunneled through. From the highest point of the irrigable area, the main canal was constructed on a prominent ridge or along the higher boundary of the land to be irrigated. Lateral canals headed at the main canal and ran along commanding situations, usually down ridges formed by irregularities of the topography, to supply the sub-laterals and ditches, or distributaries, which delivered the water to each land tract (Hall, 1994).

### III. HISTORY OF THE DESCHUTES IRRIGATION AND POWER CO. CANAL

The current Central Oregon Irrigation District dates its founding from the very beginning of irrigation in the Bend area, although the district is only the last in a series of mergers, buy-outs, and name changes. The Central Oregon Irrigation Company (1910) and its predecessor, Deschutes Irrigation and Power Company (1904), irrigated the largest acreage in the Bend area and was instrumental in building a significant number of miles of canals and laterals. The founding and development of the city of Redmond in 1906 (and incorporation in 1910) is the result of extending the Central Oregon Irrigation Company's Pilot Butte Canal northward to irrigate lands in that area of Central Oregon.

A. M. Drake arrived in Bend in the summer of 1900 and formed the Pilot Butte Development Company. In early October 1900, Levi D. Weist, an engineer, was employed to establish diversion points and ascertain prospective irrigation acreage. The company then began preparing preliminary surveys of the entire area contemplated for irrigation (Deschutes County Historical Society 1985).

On May 31, 1902, a contract was signed between the Pilot Butte Development Company and the State of Oregon for the reclamation of lands comprising 84,708 acres, following the original reclamation contract for these lands between Oregon and the United States under the terms and provisions of the Carey Act. However, before any contracts had been made with settlers, and before any considerable amount of construction had been performed by the Pilot Butte Development Company, this corporation assigned the



contract and all of its rights thereunder in 1904 to the Deschutes Irrigation and Power (D.I.P.) Company headed by Eugene Guerin. The D.I.P. Company immediately commenced construction of the system to reclaim those lands in accordance with the plans filed with the Department of the Interior.

The size of the irrigation project was such that it was not possible to bring water to the land immediately after beginning construction. In addition to contemplating the irrigation of a large number of acres, the different irrigated sections were scattered in three counties: Deschutes, Crook, and Jefferson. However, in the first year of construction (1904), the Deschutes Irrigation and Power Company managed to irrigate 40 acres (Deschutes County Historical Society 1985).

The D.I.P. Company entered into an aggressive advertising campaign to attract settlers. An example advertisement read:

*FREE LAND IN OREGON. In the richest grain, fruit and stock section in the world. Thousands of acres at actual cost of irrigation. Deeds issued from the State of Oregon. WRITE TODAY. Booklet and map free. Deschutes Irrigation and Power Company, 610-11-12 McKay Building, Portland. (Deschutes County Historical Society, 1985)*

In July 1904 the Deschutes Irrigation and Power Company project began large-scale construction, building flumes and canals north and east. From diversion points on the Deschutes River upstream from Bend, two main canals were constructed. (The original diversion from the river south of Bend was by means of a wooden box flume. In 1928, a wooden semicircular flume replaced the structure, and, in 1973-74 it was again replaced with a steel pipe and siphon.) One, the Deschutes Irrigation and Power Co. Canal, originated four miles above Bend and ran in an easterly direction to Alfalfa, then north through Powell Butte to within a few miles of Prineville. The other, the Pilot Butte Canal, pointed north toward the present-day Redmond area. The company struggled until 1907 by which time it had completed its two main canals, and entered into contracts with landowners for about 27,000 acres of irrigable land.

By the spring of 1907 the D.I.P. Company had incurred a large amount of bonded indebtedness. On June 17, 1907, a new contract was entered into between the irrigation company and the state for about 56,000 acres which had not yet been claimed by settlers. Encountering further financial difficulties, Deschutes Irrigation and Power Company transferred all contract rights to the Central Oregon Irrigation Company in November 1910 (Deschutes County Historical Society 1985).

The newly formed Central Oregon Irrigation (C.O.I.) Company originally conducted its business from the town of Deschutes, midway between Bend and Redmond. Reorganized as an irrigation district in 1921, the C.O.I. Company headquarters were moved to Redmond.

Frederick S. Stanley, pioneer irrigationist, with associates (E.A. Baldwin, E. Guerin, John Steidl and J.E. Sawhill), founded the Central Oregon Irrigation Company. A subsidiary company of

Stanley's, the Deschutes Townsite Company, formed principally to provide financial assistance to farmers, filed a formal plat of the townsite of Deschutes on July 18, 1911. Though no longer extant, Deschutes boasted a school, hotel, depot and storage sheds while the main canals were being constructed.

Stanley was an enthusiastic community builder. Born in Chippewa Falls, Wisconsin in 1864, he settled in Central Oregon in 1917, after having been a member of the caravan that escorted E.H. Harriman to central Oregon in 1907. Stanley owned the Railroad Exchange and the Royal buildings in Portland, had extensive interests in Columbia Gorge timberlands and the Stanley-Smith Lumber Company of Hood River, where he also served for a time as president of the First National Bank of Hood River. Stanley also had other holdings in Grande Ronde timber near Perry in Union County (Deschutes County Historical Society 1985).

By 1914, the D.I.P. Canal had 44.15 miles of main canal and 187.5 miles of laterals diverting 110,000 acre-feet of water from the Deschutes, while the North/Pilot Butte Canal handled 15,900 acre-feet. In 1924, only twenty years after the first forty acres were actually irrigated, 28,500 acres were under irrigation, producing annual crops and supporting a population of about 2,000 persons.

By 1921, conflict arose between the C.O.I. Company and the Central Oregon Irrigation District, a quasi-municipal corporation organized in 1917 by system water users. Bitterness grew among the water users over which groups would gain control of the system. The contention evolved into a lawsuit. State Circuit Court Judge John McCourt issued the final decree, known as the Dietrich Decree, on July 9, 1921. It ordered the Central Oregon Irrigation Company to turn over the system, in its entirety, to the Central Oregon Irrigation District. (This decision was based on a 1907 contract stipulation that the system must be turned over to a water users' association within five years after completion of construction.)

Today, the Central Oregon Irrigation District supplies water through the D.I.P. Canal as one of six historic Bend area projects diverting water to three counties for the irrigation of 120,000 acres.

#### IV. PROJECT INFORMATION

This documentation was undertaken by the Research Unit of the Environmental Section of the Oregon Department of Transportation as a result of a highway improvement project being undertaken by the Oregon Department of Transportation. Sections of the historic resource documented in this report are located within the boundaries of the Bend Parkway project and will be impacted in varying degrees by project construction. The Bend Parkway project defines a new route for the Dalles-California Highway (U.S. 97) through the city of Bend, Deschutes County, Oregon. It creates a new alignment for U.S. 97, removing it from its existing course along 3rd Street to one which, except for portions near the north and south ends of the project,

closely parallels Division Street (Fig. 2). The project area runs 6.9 miles and includes sidewalks and a 4-lane limited-access facility, with a raised median and shoulder/bike lanes. Other features of the project are structures, signalized intersections, and interchanges.

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