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U.S. Department
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Dolores Project



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General Description

The Dolores Project, located in the Dolores and San Juan River Basins in southwestern Colorado, uses water from the Dolores River for irrigation, municipal and industrial use, recreation, fish and wildlife, and production of hydroelectric power. It also provides flood control and aids in economic redevelopment. Service is provided to the northwest Dove Creek area, central Montezuma Valley area, and south to the Towaoc area on the Ute Mountain Ute Indian Reservation. A full and supplemental supply of irrigation water is available for 61,660 acres.

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Plan

Primary storage of Dolores River flows for all project purposes is provided by McPhee Reservoir, formed by McPhee Dam and Great Cut Dike. Dawson Draw Reservoir, located west of McPhee Reservoir, was constructed specifically for fish and wildlife enhancement and is supplied primarily from irrigation return flows.

An average annual supply of 90,900 acre-feet of water is provided to 27,860 acres of full service land in Dove Creek, 7,500 acres of full service land in Towaoc, and 26,300 acres of supplemental service land in Montezuma Valley. Water for the Dove Creek area is pumped from McPhee Reservoir by the Great Cut Pumping Plant and conveyed 39.5 miles through the Dove Creek Canal and its 7.6-mile branch, the South Canal. Water for the Towaoc area is conveyed 48 miles from the reservoir by the Dolores Tunnel and the Dolores and Towaoc Canals. Both areas are served by sprinkler irrigation systems. The Montezuma Valley area is served by releases at Great Cut Dike and the Dolores Tunnel and Canal to an existing gravity distribution system.

Powerplants are located on McPhee Dam and the Towaoc Canal to generate an annual average of 36,578,000 kilowatt-hours, which enters the Colorado River Storage Project power transmission system. The McPhee Dam facility operates year-round on fishery releases from McPhee Reservoir, while the Towaoc Canal plant operates from April to October on the irrigation water supply conveyed through the canal.

Facility Descriptions

McPhee Dam and Reservoir and Great Cut Dike

McPhee Dam, located on the Dolores River, is a rolled earth, sand, gravel, and rockfill structure with a volume of approximately 6,230,000 cubic yards. The crest of the dam is 270 feet high above streambed, 1,300 feet in length, and 30 feet wide. A gated spillway located in the right abutment includes a concrete chute leading to a stilling basin. The outlet works, located in the left abutment of the dam, has two separate intake structures, and a total capacity of 5,000 cubic feet per second.

Great Cut Dike is a rolled earthfill structure with a crest length of 1,900 feet, and crest width of 30 feet. It has a maximum height of 64 feet above original ground surface. The embankment has a volume of about 189,000 cubic yards.

McPhee Reservoir was created with the construction of McPhee Dam and the Great Cut Dike in a saddle on the Dolores-San Juan Divide. The reservoir has a total capacity of 381,195 acre-feet, including 229,200 acre-feet of active capacity, 151,900 acre-feet of inactive capacity, and 95 acre-feet of dead storage. The water surface area totals 4,470 acres at the top of the active capacity at an elevation of 6924.0 feet. The reservoir extends approximately 10 miles up the Dolores River, 4 miles up Beaver Creek, 1 mile up Dry Creek, 2 miles up House Creek, and 2 miles up the Great Cut saddle to the dike.

Dawson Draw Dam and Reservoir

Dawson Draw Dam, constructed on Dawson Draw about 9 miles north of Cortez, is an earth, sand, gravel, and rock structure with a volume of 106,000 cubic yards of material. At a crest elevation of 6556.0 feet, the dam is 56 feet high, 1,085 feet long, and 30 feet wide. Dawson Draw Reservoir provides habitat for fish, waterfowl, and other wildlife, and has a total capacity of 3,310 acre-feet, consisting of 3,210 acre-feet of inactive capacity and 100 acre-feet of dead capacity. A surcharge capacity of 2,360 acre-feet provides storage for floodflows temporarily until they can be discharged over the spillway. Sediments will occupy a volume of about 480 acre-feet after 100 years.

Great Cut Pumping Plant

Great Cut Pumping Plant at Great Cut Dike consists of ten vertical, mixed-flow pumping units. Eight of the pumps are multi-stage and lift water from the reservoir through a discharge line into the Dove Creek Canal. The two remaining pumps lift water through a discharge line into the `U` lateral if the reservoir water surface is too low for gravity releases. Annual energy requirements for the eight pumps average about 5,800,000 kilowatt-hours. The additional two require an annual average of 99,000 kilowatt-hours.

Sprinkler Pumping Plants

Six pumping plants, including four along the Dove Creek Canal and two along the South Canal, provide water to pipe laterals for sprinkler irrigation. The average annual energy requirement for operating the plants is approximately 10,890,000 kilowatt-hours.

Dove Creek Canal

The Dove Creek Canal heads at the end of the pump discharge line at Great Cut Dike and extends northwest for 39.5 miles to Monument Creek Reservoir. It has an initial capacity of 380 cubic feet per second and a terminal capacity of 30 cubic feet per second. It includes a turnout to the South Canal and to the four sprinkler pumping plants.

South Canal

The South Canal heads on the Dove Creek Canal near Pleasant View and extends 7.6 miles to the south and west. It has an initial capacity of 150 cubic feet per second and a terminal capacity of 35 cubic feet per second. It

includes turnouts to three pressure pipeline sprinkler irrigation systems.

Dolores Tunnel

The Dolores Tunnel was drilled through the Dolores-San Juan divide about 2 miles west of the town of Dolores and 1 mile downstream from the existing tunnel of the Montezuma Valley Irrigation Company. Maximum capacity is 520 cubic feet per second.

Dolores Canal

The Dolores Canal heads at the outlet of the Dolores Tunnel and extend for 1.3 miles to the south and east. The canal replaced approximately 0.5 mile of the existing West Lateral and 0.8 mile of the existing East Lateral. Initial capacity is 520 cubic feet per second; the terminal capacity is 475 cubic feet per second.

Towaoc Canal

The Towaoc Canal heads on the Dolores Canal 1.1 miles below the outlet of the Dolores Tunnel and extends southward for 45.4 miles to the full service lands in the Towaoc area. The canal is earth lined for 32.8 miles and concrete lined for 7.5 miles. It has an initial capacity of 135 cubic feet per second and a terminal capacity of 86 cubic feet per second.

Cortez-Towaoc Pipeline

The Cortez-Towac Pipeline heads just above the terminus of the Dolores Canal and extends southward 19.5 miles to near Towaoc. The initial section to Cortez carries 17.3 cubic feet per second and the remainder extending to Towaoc carries 2.9 cubic feet per second.

Laterals and Drains

Twelve lateral systems with a total of 84.7 miles were constructed to deliver water to farms in the Dove Creek and Towaoc areas. Project drainage facilities were provided for both areas.

McPhee Dam Powerplant

The McPhee Dam Powerplant consists of a penstock located within the outlet tunnel of the dam, a single turbine and generator at the base of the dam, and a 4.5 mile, 13.8-kilovolt transmission line to Great Cut Switchyard. Plant capacity is 990 kilowatt-hours, and produces an average of 6,260,000 kilowatt-hours annually.

Tawaoc Canal Powerplant

Towaoc Canal Powerplant capacity is 10.5 megawatts, and produces an average of 30,318,000 kilowatt-hours annually. A 78-inch-diameter, buried concrete pipe penstock heads at a project works on the Dolores Canal and extends southwest for about 11,700 feet into Hartman Draw to the powerhouse. The powerhouse consists of two turbines connected to two 4.5-megawatt generators and one turbine connected to a 1.5-megawatt generator.

Operating Agencies

The Dolores Water Conservancy District administers project and joint-use facilities within its boundaries, and the Ute Mountain Ute Indian Tribe and the Bureau of Indian Affairs administer facilities serving the reservation. The Forest Service, Bureau of Land Management, and Colorado Division of Wildlife participate in managing recreational and cultural facilities and wildlife lands.

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Development

History

In 1873, modern development began in southwest Colorado when the Federal Government opened the nearby San Juan Mountains to mining. In the early 1880's, settlers moved into the Montezuma Valley.

These early settlers began farming the land but soon realized that to ensure good harvests they would need more water than was available from the small streams in the Montezuma Valley. To meet this need, they built irrigation canals that conveyed water from the Dolores river to the fertile but dry valleys in the San Juan river Basin. The canals did help, but they carried too little water and shortages continued to plague the farmers and residents. The Dolores Project ensures an adequate supply of water to meet existing and future agricultural and municipal needs.

Investigations

Definite plan studies were made and published in April 1977. The report updated the physical data and included revised financial and economic analysis of the project, based on the feasibility report transmitted to the Congress on March 17, 1966, which led to authorization.

Anticipated environmental impacts were detailed in the final environmental statement filed with the Council on Environmental Quality on May 9, 1977. Included in the studies were analyses of water resources, water quality, fisheries, wildlife, threatened or endangered species, scenery, economic and social conditions, historic and archeological sites, recreation, and a summary of unavoidable adverse impacts with short-term losses compared to long-term gains

Archeological investigations disclosed that although the project would not affect any properties listed on the National Register of Historic Places, it could disturb about 487 known archeological sites, either within proposed rights-of-way or in other areas that would be altered by project construction. An excavation program preceded each stage of construction to remove and preserve all significant findings.

Authorization

The Dolores Project was authorized by the Colorado River Basin Act of September 30, 1968 (Public Law 90-537), as a participating project under the Colorado River Storage Project Act of April 11, 1956 (Public Law 84-485).

Construction

A ground breaking ceremony for the project was held September 24, 1977, at the site of the Great Cut Dike, northwest of Cortez.

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Benefits

Irrigation

Project water is available for 61,660 acres and benefits the area's economy by increasing agricultural production, and strengthening service-related enterprises dependent on agriculture. Main crops are alfalfa, pasture, barley, oats, and corn silage for livestock feed.

Domestic, Municipal and Industrial

The annual municipal and industrial water supply of 8,700 acre-feet will permit a moderate but healthy future growth in the area.

Recreation, Fish & Wildlife

Water releases from McPhee Reservoir created a downstream fishery. Releases from the reservoir in anticipation of snowmelt flows are managed to benefit white-water boaters. The project reservoirs and facilities provided new recreation opportunities for the public. Land acquired and managed for wildlife conservation created valuable and unthreatened habitat for a variety of wildlife species.

Hydroelectric Power

The average annual energy production of McPhee Dam and Towaoc Canal Powerplants is in excess of that needed by the project. Rather than draining the nation's energy resources, the Dolores Project generates environmentally clean power which helps alleviate the problems caused by dwindling fossil fuel supplies.

Flood Control

McPhee Reservoir provides flood protection for downstream landowners. The Dolores Project has provided accumulated actual benefits of \$2,000 between 1950 to 1999.

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