



W. E. BERG, CHIEF ENGINEER WATER DEPARTMENT, MINNEQUA STEEL WORKS

Mr. Berg entered the Company's service April 12, 1902, as draftsman in Minnequa Steel Works. On June 1 of that year he was appointed chief draftsman. He was promoted to the position of chief engineer of Minnequa Steel Works July 1, 1912, and served in that capacity until recently, when he entered upon his present duties.

WATER SYSTEM OF THE MINNEQUA STEEL WORKS

W. E. BERG, Chief Engineer, Water System

Before the enlargement of the Steel Works in 1900, the water supply was taken from the St. Charles River and the water was carried through a ditch built in 1892 to Lake Minnequa or No. 1 Reservoir. This St. Charles Ditch was built large enough to carry water rights of about 13 cubic feet per second, and the length of the ditch is about 11 miles.

From Lake Minnequa the water was carried through one 12-inch pipe to the steel works. About 1899, one 28-inch wooden pipe line was built from Lake Minnequa to the Steel Works, replacing the 12-inch pipe. During the early years the water supply was small and repumping had to be done.

When the enlargement of the Steel Works was being planned, it was found necessary to get larger reservoir capacity and more water. In 1900, No. 2 reservoir was built. The reservoir has a capacity of 2,706 acre feet at the maximum height of 23½ feet. Then one 28-inch wooden pipe line 8 miles long was constructed from this reservoir to the Steel Works.

Then No. 3 reservoir was built, located above No. 2, and of a capacity of 3,185 acre feet at a maximum height of 32 feet. No. 3 reservoir was connected by four 30-inch pipes to No. 2, and the pipes are provided with screens and valves for operation.

To get more water, one feeder ditch was constructed in 1901 to carry storm water from the St. Charles River to reservoir No. 3. This ditch has a length of about 5 miles, and from there the water is carried through Salt Creek for a distance of 16 miles, making a total distance of 21 miles. Salt Creek empties into No. 3 reservoir, because No. 3 reservoir as well as No. 2 were built intercepting Salt Creek. The Feeder Ditch was built to carry

500 second feet. The St. Charles Ditch was changed, providing an outlet to No. 2 Reservoir.

THE ARKANSAS VALLEY CONDUIT

As the enlargement of the Steel Works during 1900, 1901, and 1902 required still more water, it was necessary to arrange for more water and one large conduit, called the Arkansas Valley Conduit, was constructed and was ready in 1906. This conduit carries 70 cubic feet per second. Its headgate and dam are located at the Arkansas River at Adobe, Colorado. The dam is 114 feet long, constructed of wood. The headgate is of concrete construction with six gates. In the conduit, and in the distance of 2,600 feet there are two sand gates at two different points for washing sand out of the ditch. When the river is high it carries a great amount of sand and mud and a great part is necessarily carried in through the headgate. Then there are two double settling basins built of concrete, and these basins are to further settle mud.

The Arkansas Valley Conduit is about 39 miles long and has 27 syphons of a total length of 7½ miles. These syphons are wooden stave pipe and vary in size from 4 to 5 feet. After a few years it was found that the pipe started to decay and a 5-inch concrete cover was put on the outside of the wooden pipes, which concrete has preserved the pipes to a great extent.

The conduit was built to follow the contours and elevations of the country most suitable for its construction, therefore, it has many curves, concrete sections built on the face of the bluffs and there are five tunnels. There have been many line changes because of the hills sliding and settling and all caused because of the broken country through which the conduit was built.



SOME STAR SWIMMERS AT THE STEEL WORKS "Y"

Back row, left to right: David Morgan, Albert Templeton, Elston Tribble, Willard Boxwell, Harold Garnett, Rudolph Carlson. Middle row: Miss Margaret Earlywine, Leonard Wallace, Lillian Saits, Emily Lancendorfer, Rose Micklich, Helen Razor, Mary Micklich, Harold Hinshaw, C. H. Winston. Front row: Bob Vukolich, Richard Morris, Frank Micklich, Frank Hummel, Arthur Smalley, Milan Elich. The following swimmers were unable to be present for the picture: Batie, Clark, Grady, Davis, Marnar, Wm. Morris, Harriet Morehart, Marie Preston, Iris Thomas, Lenore Brown, Alice Hanson, Dorothy Schenck.

Before the Arkansas Valley Conduit was ready, it was necessary to put in one pumping plant inside the Steel Works to pump water from the Bessemer Ditch, said water being conveyed through said ditch from the Arkansas River and supplied by water from the company's reservoir at Leadville, called Sugar Loaf Reservoir.

The Sugar Loaf Reservoir was ready in 1903 and has a capacity of 17,416 acre feet at a maximum height of 30 feet.

The 28-inch wooden line from No. 2 reservoir to the plant was not adequate, so in 1906, and in connection with the building of the Arkansas Valley conduit, there was constructed one 48-inch wooden stave pipe line from No. 2 reservoir to the Steel Works. This 48-inch wooden line was encased at a very early date with reinforced concrete which has proved very preserving to the pipe line.

When the Arkansas Valley Conduit and the 48-inch pipe line were ready in 1906 there was ample water supply to the Steel Works from the 70 second feet water rights in the Arkansas River. The St. Charles Ditch water rights and the Feeder Ditch were used mostly as a standby and were utilized more in winter time when the Arkansas Valley Conduit could not be operated.

NO WATER WASTED

The Steel Works receives its water supply as above described and whatever is not used up in the plant is returned through the main sewer to Salt Creek and thereby to the Arkansas River. The return to the river averages 80 per cent of the total amount of fresh water from reservoirs. Since the Coke Plant was built and other enlargements of the Steel Works have been made, the amount of water used in the plant has been greatly increased. Sometimes 32,000,000 gallons of fresh water are put into the

plant in 24 hours from the reservoirs, although a large amount of water is constantly repumped. Therefore, the water supply as above described should be supplemented by installation of additional repumping.

Feeder Canal is operated by one man. Reservoirs Nos. 2 and 3, and that part of the St. Charles Ditch from No. 2 to Lake Minnequa used to carry seepage water from the reservoirs to Lake Minnequa, also that part of the Arkansas Valley Conduit from reservoirs to Beulah Road is operated by two men. The Arkansas Valley Conduit is operated by one general foreman, one foreman, and 14 men which serve as ditch walkers, headgate keeper and truck driver.

Because of the difficult location of the Arkansas Valley Conduit, it has to be watched and operated with great care so an adequate force of men is necessary for operation of the conduit. There are also required a varying force of men to repair damages from storms and to make the most necessary improvements.

After the water has been delivered through a 48-inch pipe to the Steel Works, the water is controlled and the different valves operated by two-valve millrights.

Sugar Loaf Reservoir is operated by one reservoir keeper.

Motor Cop (after a hard chase): "Why didn't you stop when I shouted back there. Are you deaf?"

Howard Schueller (with only five bucks but plenty of presence of mind): "I thought you just said 'Good morning, Senator.'"

Cop: "Well, you see, Senator, I wanted to warn you about driving fast through the next township."—Armco Bulletin.