

**CITY OF HUXLEY
WATER TREATMENT SYSTEM
IMPROVEMENTS 2000-2003**

PROJECT SPONSOR:

City of Huxley, Iowa

IMPROVEMENTS COST:

Construction cost of \$ 3,800,000

CONTACT: Mr. Jeff Peterson

Public Works Director



PROJECT CONCEPT: The project involved preliminary planning and final design for development of new wells, new treatment plant, transmission pipelines, and re-use of the existing 500,000-gallon elevated storage tank designed by Snyder & Associates in 1986. The new well capacity and treatment plant capacity of 700 gallons per minute (gpm) will allow for significant growth to serve a future population of 4,200 people in the City of Huxley water service area. The old existing water system had shallow wells of low flow capacity, a deep well containing high radium, and structurally deteriorating water treatment equipment.

PROJECT ACCOMPLISHMENTS: To allow for the City's future growth and development, a new well field with two 700 gpm wells and a new treatment system complete with iron and manganese removal and ion exchange softening was provided. High service pumps discharge the treated water into the City distribution piping system and into the existing elevated storage tank. Distribution system piping modifications were proposed by Snyder and Associates to maintain adequate distribution system pressures and to fully utilize the entire storage volume of the existing elevated storage tank.

The new well pumps discharge the well water through a 10,000-foot long transmission to the new treatment plant site. The treatment system includes induced-draft aeration followed by detention and potassium permanganate chemical feed to enhance iron and manganese removals. Pressure filtration using specially treated anthracite filter media has regularly resulted in over 99 % iron removal and over 98 % manganese removal in the filtered water. Ion exchange softening of 75 to 80 % of the filtered water is utilized to produce the desired final water hardness of 80 to 100 mg/l. The softened water is chlorinated and pH is adjusted to its setpoint value of 7.8 to 8.0 before being discharged into the 200,000-gallon ground storage tank at the treatment plant. Based on demands in the City distribution system, the high service pumps discharge treated water into a 10,000-foot long transmission main connecting to the distribution system and the elevated storage tank in the center of the City. The treated water is final chlorinated and fluoridated before being discharged from the treatment plant.

The wells, treatment system, and elevated storage are controlled to operate in sequence based on process demands using electrical control consisting of programmable logic controllers (PLCs) and high frequency radio signal telemetry system.

The new wells and new water treatment system were placed in-service in May 2003.