

INFRASTRUCTURE

This chapter reviews Thermopolis's infrastructure in terms of the capability to support growth and development of the town. Infrastructure, including the water system, wastewater treatment, drainage, electrical power, natural gas, telecommunications, and solid waste management are the backbone of the town. (Transportation infrastructure is discussed in the separate Transportation Chapter.) The condition of infrastructure usually controls what can happen in any given community. New infrastructure, when it is well planned in terms of the design, cost, and timing, will have a strong influence on proper development of the town.

TREATED WATER SYSTEM

Thermopolis's water system is generally capable of supporting additional growth and development. However, a number of improvements to the system are necessary to maintain the system and prepare it for future growth.

The water system has been extensively studied by the Town's engineers. Most of the information presented here to describe the water system is from the 255-page report, Thermopolis Storage and Raw Water: Level 2 Study Project Notebook prepared by Engineering Associates in 2006. Unless otherwise noted, this report is the information source for the following discussion.

Water System Components

Thermopolis has a complex water system for a town of its size. This is due to the terrain, which has necessitated the use of seven different water tanks at different locations and three different pump stations. Water systems for similar sized communities are usually much less complex and are easier to operate and maintain. The Town presently charges \$3.05 per 1,000 gallons of water in-town and \$3.78 out-of-town.

Thermopolis's treated water source is the Big Horn River. The water intakes are located on the south end of town at the water plant. The town also uses shallow wells located at the water plant as a supplementary source during high-usage periods (irrigation season). The source waters are filtered and treated at the water plant then pumped to several storage tanks located at higher elevations in the town. The Town has seven storage tanks with a total capacity of 2.1 million gallons. One large storage tank (Old Arapahoe Tank) is about to be replaced at west end of town.

On an average day, the water system provides 904,000 gallons (628 gallons per minute). The water plant is rated capable of producing 5 million gallons per day. The system experiences dramatic increases in water consumption during the summer associated with an influx of tourists and demands for landscape irrigation. Daily usage of 2.9 million gallons per day have occasionally been experienced in recent years.

The water distribution system includes storage tanks and water mains. The Town has adequate storage capacity although there are areas of Town (particularly in the northwest) with fairly low water pressure. The majority of the water pressures in town are good, ranging from 40 -90 pounds per square inch. However, there are areas where pressures for firefighting purposes are inadequate.

The Town's engineers have recommended replacement of all the older asbestos-concrete water mains, which have become brittle and narrowed internally with age. In 2006, the system included over 55,000 lineal feet of asbestos-concrete pipe.

Water Rights

The Town four adjudicated water right permits to divert from the Big Horn River at the water treatment plant with priority dates ranging from 1898 to 1908. The largest permit allows the treatment plant to divert 538 gallons per minute while the other three permits allow a combined diversion of another 543 gallons per minute from April 1 to August 15 each year. The Town maintains 200 acre-feet of operating storage and 1,000 acre-feet of standby storage in Boysen Reservoir. In recent years, the most of the operational storage that was used was 49.1 acre feet in 2004. The Town also holds water rights to divert from the river for the Legion Pipeline used for irrigation at the golf course. Thermopolis water rights coupled with water storage contracts at Boysen Reservoir can exceed the 5 million gallons per day capacity of the water treatment plant. According to the Town's engineers, the Town has ample water rights available to meet current and future needs.

Irrigation

Treated water is used for landscaping irrigation in Thermopolis because the town does not have a separate raw water system. The only exceptions are Riverside Cemetery and the Legion Golf Course, which have separate raw water systems. The town's engineers have investigated the idea of expanding the golf course raw water irrigation system to irrigate large lawn areas in town such as the high school football field and Monument Hill Cemetery. Expansion of the raw water system to irrigate areas currently irrigated with treated water would reduce the demand for treated water (by an estimated 11%) and thereby relieve stress on the water treatment plant. The raw water expansion project is estimated to cost \$2.9 million in 2007.

The Town's engineers have estimated the seasonal variation in treated water usage. On the average summer day, the town uses 1.24 million gallons while in the winter the daily average is only 0.57 million gallons. By attributing some of the difference to tourist usage, engineers have estimated that irrigation usage of treated water is 0.53 million gallons per day. The engineers also note the importance of maintaining the existing raw water irrigation systems--the treated water system is not capable of producing enough water to substitute for the existing raw water usage. Upkeep and improvement of the existing raw water systems is important to avoid reverting to treated water for irrigating the golf course and Riverside Cemetery.

Out-of-Town Service

Besides serving the in-town population of about 3,000 people (equivalent to 1,880 water services), the town provides water to areas outside the town limits.

Out-of-Town Water System	Households Served
Town of East Thermopolis	123
Town of Kirby	37
Lucerne Water & Sewer District	117
Red Lane Domestic Water, Inc.	48
South Thermopolis Water & Sewer District	111
TOTAL	436

Sources: Hot Springs-Worland Pipeline Level 2 Study 2004; and South Thermopolis Level 2 Study 2009.

The out-of-town water users, who generally do not use the water for landscape irrigation, accounted for 11 percent of the average daily water demand (2003-2005).

Planned Projects

The Town's engineers have evaluated the current water system for its ability to serve a town population of 4,024 people in the year 2035 (this is over 1,000 more people than the current population). This has resulted in a number of recommended improvements:

- **Water Tanks:** The Town is planning to replace its existing 1920s-era 500,000 gallon storage tank (Old Arapahoe St. Tank) with a new 500,000 gallon tank at the location of the existing "Airport Tank" on Airport Road. This project is expected to be completed this year. (Overfield)
- Two 200,000-gallon tanks west of Round Top Mountain, which facilitates development near the airport and the new Owl Creek Water District system.
- The Town is also planning to add a small (20,000 gallon) tank next to the existing 50,000 gallon tank for the Cedar Ridge area.
- **Water Line Replacements:** New water lines connecting the new tanks near Round Top and fire flow replacement needs at 13th Street and Meadowlark Lane.

In addition, there are three out-of-town project proposed which would impact the Thermopolis water system:

- Owl Creek: Property owners in the Owl Creek area have formed a new water district with the intention of providing rural water service to the area. The project will extend water service from Thermopolis to 31 households at a cost of \$4.7 million. (Independent Record) The project will be capable of serving future growth in the Owl Creek area ultimately serving about 200 residences.
- South Thermopolis: The South Thermopolis Water and Sewer District is planning on expanding water service within its district. A new water storage tank and water mains will serve homes in the district that presently do not have service and are having water supply problems. The project will provide service to 48 homes at a cost of \$3.2 million. (Independent Record) The project is designed to ultimately allow the district to double the population it presently serves.
- Regional Water System: The Regional Water System is a multi-county water system that ties together the water systems of communities from Greybull to Kirby and Worland. Thermopolis opted out of the system during the planning stage in 2006. Because the Kirby and Lucerne water systems will be served from the Regional system within the next two years, Thermopolis will no longer provide water to the 154 services in those districts. (Overfield)

WASTEWATER TREATMENT SYSTEM

Wastewater in Thermopolis is collected is collected by a network of sewer lines and then is treatment at the Town's wastewater treatment plan. Over three-quarters of town sewer lines (97,000 lineal feet) are old "vitrified clay" pipe which need repair or replacement. Newer plastic pipe comprised about one-quarter of the sewer lines (29,000 lineal feet) and these are primarily located along the major highways. The older vitrified clay sewer lines are located in most residential areas and in much of the downtown.

The Town has begun replacing the vitrified clay lines. An on-going project to replace 10,000 feet of clay line was begun last year (2009) and is expected to be completed this year.

The sewer lines all flow by gravity alone to the old sewage treatment plant location on North Second Street. From there untreated sewage is pumped uphill to the new treatment plant.

The town's wastewater treatment plant was relocated in 2006 to a peninsula on the east side of the Big Horn River. The plant is a lagoon-type system. The plant was designed and constructed to accommodate a substantial amount of growth--one percent increase per year for 30 years. Plant capacity is more than adequate for any growth that Thermopolis is likely to experience.

STORMWATER DRAINAGE

Thermopolis, with average annual precipitation of about 12 inches, does not have a town-wide stormwater drainage systems. Storm sewers are in place along the major highways. Storm sewers are also found in the downtown area along Arapahoe, Broadway, and Warren Streets.

The town has several natural drainage channels that carry stormwater off the surrounding hills. These are zoned as open space where all development including filling, grading, and excavation area regulated. In the Candy Jack draw, about 4,000 feet of 108" diameter pipe from 14th Street to the river was laid and covered over after floods in 1967 and 1973 damaged over 100 homes. (Milek) There are open drainage channels south of Amoretti and Richards Streets as well as two leading south off Round Top Mountain.

ELECTRICAL POWER

The electric power company Rocky Mountain Power, a subsidiary of PacifiCorp provides electrical service in Thermopolis.

TELECOMMUNICATIONS

RT Communications of Worland provides broadband telecommunication services to Thermopolis. These services include telephone, television, and high-speed Internet connection services.

NATURAL GAS

Wyoming Gas Company provides natural gas service in Thermopolis.

SOLID WASTE MANAGEMENT

The Town of Thermopolis owns and operates the Thermopolis Landfill located north of the Town of Thermopolis. The landfill is an unlined trench and area fill operation. Under existing conditions, it is estimated that the entire site has a remaining life of approximately 16 years. Solid waste collection services are provided by the Town. Limited recycling services are provided by the Town at the landfill and the public works shop, and by Big Horn Enterprises, a local non-profit organization. (Thermopolis Integrated Solid Waste Management Plan)

SOURCES

Milek, Dorothy Buchanan. Hot Spring: A Wyoming County History. 1986

Overfield, Health, P.E., Engineering Associates-Thermopolis. Personal communication, March 23, 2010.

Thermopolis Independent Record, Vol. 110, No. 49, Dec. 3, 2009. "WWDC Forwards Water Projects, "

Thermopolis Storage and Raw Water: Level 2 Study Project Notebook. Engineering Associates, May 1, 2006.