

WATER SYSTEM ERU CAPACITY LIMITS

WATER QUALITY

McCleary meets all applicable DOH regulations required for water quality. McCleary has consistently provided a high quality of drinking water to its service area.

WATER RIGHTS

As shown in Tables 3-12 and 3-13, McCleary has adequate water rights to meet projected 10- and 20-year growth demands of the system.

Instantaneous Water Right Capacity Limit

From Table 1-4, the City of McCleary has 1,100 gpm of instantaneous water rights. Assuming that these rights would need to be exercised in 18 hours per day, the instantaneous water rights limit can be calculated as follows:

$$\frac{\text{Instantaneous Water Rights}}{\text{Connections Limit}} = \frac{1,100 \text{ gpm} \times 1,080 \text{ min/day}}{496 \text{ gpd per ERU}} = 2,395 \text{ ERUs}$$

However, assuming that use of these rights could be exercised over 24 hours per day, the instantaneous water rights limit would be calculated as follows:

$$\frac{\text{Instantaneous Water Rights}}{\text{Connections Limit}} = \frac{1,100 \text{ gpm} \times 1,440 \text{ min/day}}{496 \text{ gpd per ERU}} = 3,194 \text{ ERUs}$$

Annual Water Right Capacity Limit

From Table 1-4, the City of McCleary has 673 acre feet (AF/Y) of annual water rights and the Average Day Demand per ERU from Table 2-7 is 163 gpd. The limit on ERUs due to the annual water right can be calculated as follows:

$$\frac{\text{Annual Water Rights}}{\text{Connections Limit}} = \frac{673 \text{ AF/Y} \times 325,851 \text{ gal/AF}}{365 \text{ days/year} \times 163 \text{ gpd per ERU}} = 3,686 \text{ ERUs}$$

SOURCE CAPACITY

The minimum required design criteria for a water system is that it should be capable of meeting a maximum day of water demand in one day (24 hours) of water production. From Table 3-14 it can be seen that McCleary has adequate source capacity to meet this criteria. However, to provide additional system reliability, the recommended source capacity would meet maximum day demands in 18 hours of pumping. Table 3-14 shows McCleary meets this recommended capacity criteria throughout the 20-year planning period. To determine the number of ERUs supportable by the existing source capacity using the 18-hour reliability criteria, we take the total amount of water that can be produced in 18 hours of operation and divide that by the maximum day demand per ERU as follows:

$$\frac{\text{Source Production Capacity}}{\text{Connections Limit}} = \frac{900 \text{ gpm} \times 1,080 \text{ min/day}}{496 \text{ gpd per ERU}} = 1,960 \text{ ERUs}$$

Source capacity is based on all existing wells and pumps in production.

TREATMENT CAPACITY

Treatment capacity meets or exceeds all regulatory requirements.

STORAGE CAPACITY

Following the 20-year planning period ending in year 2037, the population is predicted to reach 1,841 and the City of McCleary will not have a storage deficit predicted over that period. To determine the number of ERUs supportable by the existing storage, the storage required for various numbers of ERUs is calculated until the result is a storage volume greater than the existing effective storage. Table 3-23 shows that the existing storage can support up to 2,274 ERUs.

TABLE 3-23

Summary of Storage Requirement Limit

ERUs	Recommended Effective Storage, gallons				Existing Effective Storage, gallons ⁽⁴⁾	Storage Surplus/ (Deficit), gallons
	Equalizing ⁽¹⁾	Standby ⁽²⁾	Fire Suppression	Total ⁽³⁾		
2,274	67,310	454,800	180,000	522,110	522,303	193
2,275	67,400	455,000	180,000	522,400	522,303	(97)

(1) Equalizing storage is calculated based on the estimated source capacity of 900 gpm.

(2) Standby storage is computed as 200 gallons times the projected number of ERUs.

(3) Total Recommended Storage is the sum of Equalizing Storage plus the greater of Standby Storage or Fire Suppression Storage since nesting is allowed.

- (4) Existing Effective Storage Capacity is from Table 3-15.

DISTRIBUTION SYSTEM CAPACITY

From a capacity standpoint, the distribution system meets all regulatory requirements except where undersized mains (4-inch) prevent delivery of fire flow.

Table 3-24 summarizes the City of McCleary's water system capacity limits.

TABLE 3-24

Water System Capacity Limits

Limiting Factor	ERU Limit	Year 2018 ERUs⁽¹⁾	Available ERUs, Surplus/(Deficit)
Installed Source Capacity	1,960	1,142	818
Instantaneous Water Rights	3,194	1,142	2,052
Annual Water Rights	3,686	1,142	2,544
Storage Capacity, Water System Design Manual	2,274	1,142	1,132

- (1) Projected ERU value in year 2018 from Table 2-10 based on existing total usage ERU value for 2017 plus 8.6 percent DSL.

WATER SYSTEM DEFICIENCIES

WATER QUALITY DEFICIENCIES

No current water quality deficiencies have been identified.

WATER RIGHTS DEFICIENCIES

No deficiencies.

SOURCE CAPACITY DEFICIENCIES

There are currently no known source capacity deficiencies. The City of McCleary installed an emergency generator to supply emergency power to the well pumps and emergency functions at the Water Treatment Plant in 2018.

TREATMENT DEFICIENCIES

There are no known treatment deficiencies or system limitations that exist within the McCleary water system.

STORAGE DEFICIENCIES

No deficiencies.

DISTRIBUTION SYSTEM DEFICIENCIES

Distribution system deficiencies were determined as a result of the hydraulic analysis discussed earlier in this chapter. In addition, the McCleary water system has approximately half of its distribution system comprised of aging AC water main. The City of McCleary has a water main replacement program that replaces the most vulnerable mains systematically prior to failure. Vulnerability is determined by the age and material of the water main, the frequency of leaks noted and repaired, and the number of customers that are serviced by a particular main. Additionally, as opportunities arise, such as road reconstruction or another utility line service, water main replacements will be conducted. Water distribution mains that are scheduled to be replaced on account of condition or hydraulic deficiencies include:

- D-1. Replace approximately 250 linear feet of 4-inch water main with 8-inch water main on Ash Street west of 9th Street.
- D-2. Replace approximately 500 linear feet of 4-inch water main with 8-inch water main on 9th Street from Simpson Avenue to the WWTP.
- D-3. Replace approximately 360 linear feet of 4-inch water main with 8-inch water main on Pine Street from 5th Street to 6th Street.
- D-4. Replace approximately 800 linear feet of 4-inch water main with 8-inch water main on 4th Street from Oak Street to Spruce Street.
- D-5. Replace approximately 850 linear feet of 4-inch water main with 8-inch water main on Mommsen Road, east of Birch Street.
- D-6 (A-C). Construct a 5,260 linear foot 8-inch diameter water main from the wellfield to the west end of Simpson Avenue.

These projects are discussed further in Chapter 8, Capital Improvement Program.