

BOULDER FARMSTEAD WATER COMPANY

WATER CONSERVATION PLAN - 2022

February 9, 2022

Project #: 2011-017

Prepared by:



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1. INTRODUCTION

Utah set a statewide water conservation goal from 2000 to 2025 of 25%. Across the state, progress has been made to meet that goal. Recently, the Division of Water Resources (DWR) has established regional conservation goals that reflect local conditions such as climate, population, and different water uses. Utah's Regional Municipal and Industrial Water Conservation Goals for Garfield County is 19% from 2015 to 2030, which equates to about 231 gallons per capita per day (gpcd).

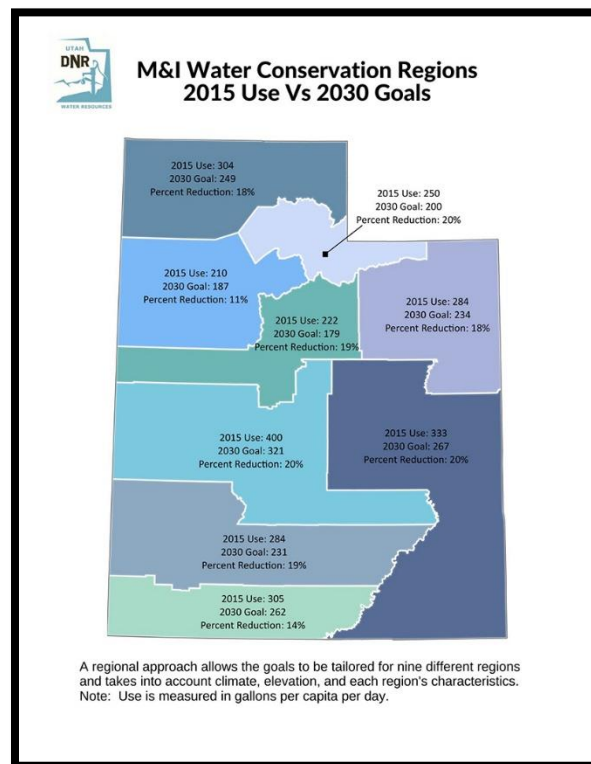


Figure 1 M&I Regional Water Conservation Goals

Providing an adequate supply of culinary water to the town of Boulder, Utah is a primary concern for the Boulder Farmstead Water Company (Company). Water conservation practices are vital in ensuring the Company is able to provide the much-needed culinary water to users on the system while also maintaining high water quality. This Water Conservation Plan is being implemented to help ensure that these needs are addressed and provided for by the Company.

2. SYSTEM PROFILE

2.1. SERVICE AREA

The Company was incorporated on June 20, 1953. It provides culinary water to customers within its service area which includes residences and business within the corporate boundaries of Boulder Town and nearby. Boulder Town is located in central Garfield County, Utah. The Town is 29 miles northeast

of Escalante, Utah on State Route 12. Boulder area residents who are not within the serviceable area of the water company obtain culinary water by means of private shallow wells. For the purposes of this plan, the Company's service area has been divided into three sub areas (System Map – Appendix A).

Service Area 1 extends from the existing 600,000-gallon tank battery located near the cemetery southward to the lowest extent of the service area. The largest number of connections and greatest demands are located in Service Area 1. Service Area 1 is also an area that is likely to experience the greatest development and population growth. All existing commercial connections are located in this area. Improvements to this area included a replacement well (2021) and additional storage (2020) to help meet future demands.

Service Area 2 comprises the central service area that extends southward from the existing Jepsen Spring source down to the existing 600,000-gallon tanks. This area has few existing connections and development potential is limited.

Service Area 3 is the highest elevation and northernmost portion of the service area beginning at the existing 250,000-gallon tank just north of the Boulder town boundary and extending southward down to the existing Jepsen Spring area. This area includes the Boulder King Ranch Estates Subdivision with the potential for 54 developed lots over the next 20 years. Improvements, including new wells, storage and distribution piping were all constructed in Service Area 3 in 2012 eliminating the deficiencies in this service area.

2.2. BOULDER TOWN POPULATION PROJECTION

According to the U.S. Census, projections for Boulder Town indicate a historic growth rate of 1.67%, using Equation 1-1.

Equation 1-1:

$$F=P*(1+r)^n$$

F=Future population after n periods of time.

P=Current population.

r=Growth rate per period n.

n=Number of periods between current and future population.

Using this growth rate, the future population projection was calculated until 2060 in increments of 10 years, see Figure 2.

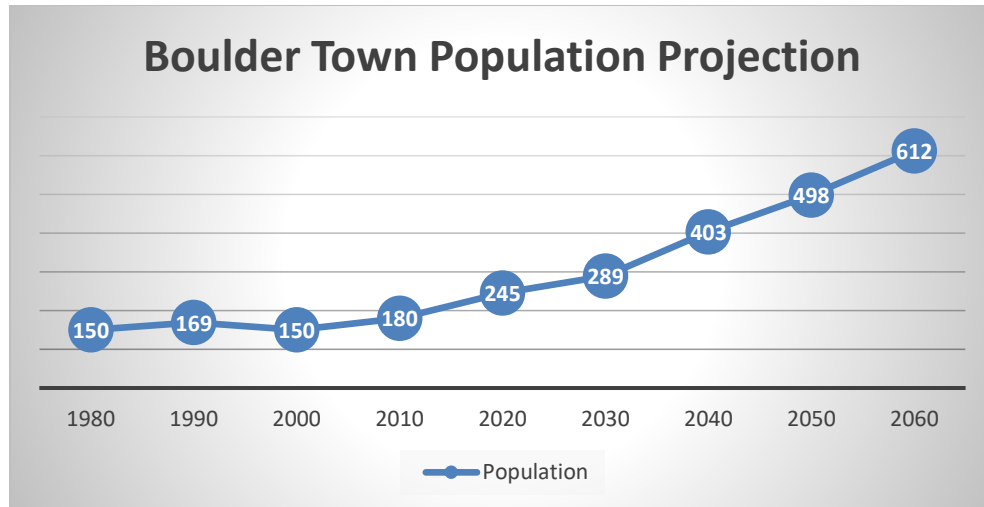


Figure 2 Boulder Town Population Projection

2.3. WATER CONNECTIONS

Future improvements to the system to increase capacity will be necessary to ensure that an adequate supply of culinary water is provided to the citizens of the community. Currently, the Company serves 190 residential connections, 9 commercial connections, 2 industrial connections, and 7 institutional connections. Table 1 below displays the current connections to the system and a 20-year projection of connection throughout each of the Service Sub- Areas.

Table 1 - System Connections

YEAR		2020	2040
Service Area 1	Residential Connections	166	231
	Commercial Connections	9	12*
	Industrial Connections	2	3**
	Institutional Connections	7	9***
	Equivalent Residential Connections (ERC)*	214	298
Service Area 2	Residential Connections	6	8
	Equivalent Residential Connections (ERC)*	6	8
Service Area 3	Residential Connections	18	25
	Equivalent Residential Connections (ERC)*	18	25
TOTAL	Residential connections	190	264
	Commercial Connections	9	24
	Industrial Connections	2	3
	Institutional Connections	7	9
	Equivalent Residential Connections (ERC)*	238	331
*1 Commercial Connection = 1.196 ERC **1 Industrial Connection = 0.118 ERC ***1 Institutional Connection = 5.299 ERC			

2.4. ERC PROJECTIONS

To project future water demands, it was assumed that the system ERCs would grow at the same rate as the population (1.67%). This assumes that the residential, institutional, and commercial connections would grow proportionally. Figure 3 shows existing and projected number of ERCs through 2040.

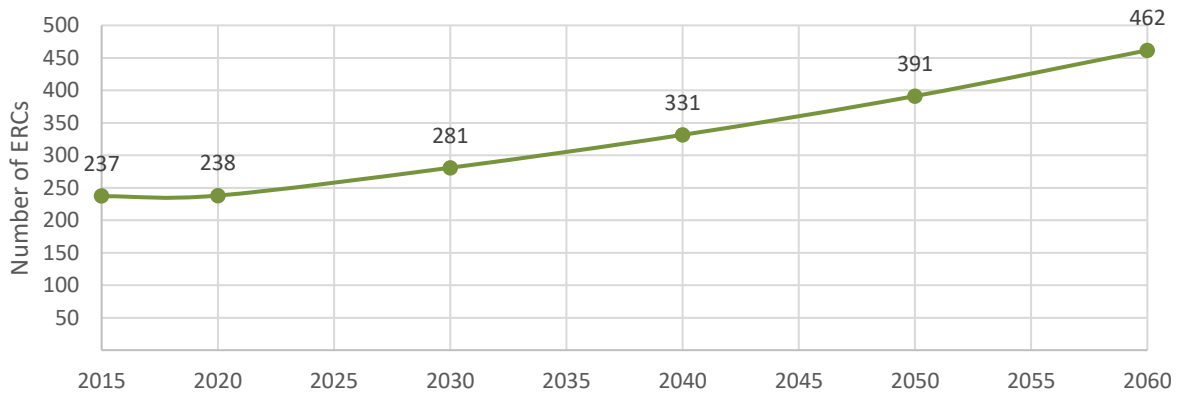


Figure 3 Projected ERC Growth

2.5. CURRENT WATER SUPPLY

2.5.1. EXISTING WATER RIGHT CAPACITY

The Company uses water produced by Jepsen Spring and three underground wells. Water Rights associated with these sources are shown in Table 3.

Table 2 - Water Rights

Water Right No.	Type of Use	Source	Period of Use	Flow
97-68, 97-158	Municipal	Jepsen Spring & Well	Jan. 1 to Dec. 31	100.56 ac-ft./yr.
97-2220	Municipal	Jepsen Spring & Well	Jan. 1 to Dec. 31	100 ac-ft./yr.
97-2106	Municipal	8" Well	Jan. 1 to Dec. 31	15.4 ac-ft./yr.
97-2190	Municipal	8" Well	Jan. 1 to Dec. 31	1.73 ac-ft./yr.
97-2198	Municipal	8" Well	Jan. 1 to Dec. 31	1.73 ac-ft./yr.
97-2235	Municipal	8" Well	Jan. 1 to Dec. 31	8.59 ac-ft./yr.
Total				228.01 ac-ft./yr.

2.5.2. EXISTING SOURCE CAPACITY

Boulder Farmstead utilizes water from mainly Jepsen Spring and uses water from wells during higher demand periods such as tourist season. The sources have shown to produce up to 220 ac-ft per year with an average production of 178 ac-ft per year, see Table 3.

Table 3 - Source Summary

Year	2020	2019	2018	2017	2016
BKRE Well (WS004)	2.51	0.05	0.00	0.00	7.34
Boulder Farmstead Well (WS002)	4.13	5.03	5.79	0.27	0.00
Garkane Well (WS003)	25.04	30.73	59.42	31.78	22.29
Jepsen Spring (WS001)	112.30	130.85	116.93	189.72	150.77
Total Per Year (Ac-ft)	143.97	166.66	182.15	221.76	180.40

Water from the springs was measured before any system use and reflects true spring production. Whereas water from the wells is based on increased demand from the system and not the full capacity of the wells.

2.5.3. RELIABLE SOURCE CAPACITY

Based on the last 5 years of spring flow data, Jepsen Spring can produce on average 140.114 ac-ft of water per year. The BKRE Well and Boulder Farmstead Well capacities are based on the safe yield capacity of the well or 2/3 the pump test rate and have a reliable capacity of 21.72 ac-ft and 107.53 ac-ft of water per year, respectively. Garkane Well's test pump rate couldn't be found readily, so an average production of the last 5 years was assumed to be the reliable source capacity, 33.85 ac-ft per year. Table 4 displays the reliable capacity of each source along with the total reliable capacity from all sources, 303 ac-ft/yr.

Table 4 - Reliable Source Capacity

Source	Reliable Capacity (ac-ft/year)
BKRE Well	21.72
Boulder Farmstead Well	107.53
Garkane Well	33.85
Jepsen Spring	140.114
Total	303.214

2.6. WATER USE

The Company reports water usage each year to the Division of Water Rights, see Table 5. Company water users are not supplied by a secondary water source and therefore the usage amounts in Table 5 show indoor and outdoor water usage. Based on water usage from 2005 to 2020, the average water usage per capita per day is approximately 286 gallons or about 0.321 acre-feet per ERC per year.

Table 5 - Water Usage

Year	Pop.	Residential Use (acre-feet/year)	Commercial Use (acre-feet/year)	Industrial Use (acre-feet/year)	Institutional Use (acre-feet/year)	Secondary Use (not reported to Water Rights) (acre-feet/year)	Total Use (acre-feet/year)	Convert from acre-feet to Gallons	Convert from Year to Day	Calculate gpcd
2020	245	72.22	4.09	0.09	14.10	0.00	90.50	29489554	80,793.30	329.77
2019	245	50.72	13.20	0.13	11.66	0.00	75.71	24670212	67,589.62	275.88
2018	240	78.14	9.57	0.28	13.62	0.00	101.61	33109764	90,711.68	377.97
2017	230	58.71	7.12	0.18	10.68	0.00	76.69	24989546	68,464.51	297.67
2016	240	65.97	5.76	0.08	10.21	0.00	82.02	26726334	73,222.83	305.10
2015	226	44.50	4.48	0.07	9.99	0.00	59.04	19238268	52,707.58	233.22
2014	226	51.13	4.10	0.07	12.10	0.00	67.40	21962386	60,170.92	266.24
2013	226	41.36	2.61	0.00	7.98	0.00	51.95	16927982	46,378.03	205.21
2010	180	29.87	3.45	0.00	34.11	0.00	67.43	21972162	60,197.70	334.43
2005	150	34.39	4.52	0.00	1.59	0.00	40.50	13196983	36,156.12	241.04

2.7. SUPPLY VS. USE COMPARISON

Comparing water supply versus water usage, see Figure 4, the Company has enough water supply to provide water for the projected water demands through 2060.

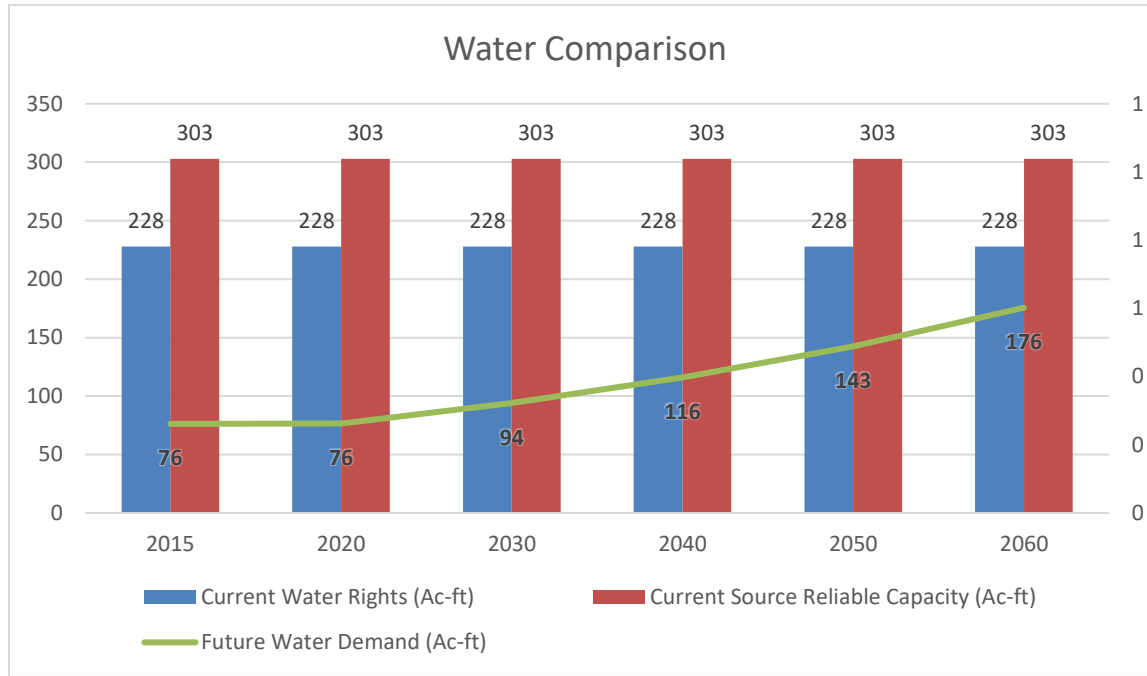


Figure 4 Water Supply vs Demand Comparison

As can be seen from the above figure, Boulder Farmstead has plenty of water rights and reliable source capacity to meet current and future demands at the current water usage per capita.

3. SYSTEM WATER LOSS CONTROL

3.1. LEAK DETECTION AND REPAIR METHODS

The Company has a water operator that makes regular checks on the system to check for leaks and areas in need of repair. Water users are also encouraged to report leaks to the Company. If repairs are needed, the water operator has the equipment necessary to make and complete water line repairs.

3.2. WATER LOSS

The Company records water from sources through meters. The main supply of water is through Jepsen Springs and the meter reading the flow is between the springs and the storage tanks. Because the nature of this configuration causes the tanks to overflow, any water loss from the overflow is not recorded and therefore the system shows an artificially high water loss see Table 6.

Table 6 - System Water Loss

Year	Total Retail Use (ACFT)	Total From Sources (ACFT)	Total Wholesale Sources (ACFT)	Total Water Loss (ACFT)	Estimated Water Loss %
2020	90.49	143.97		53.48	37.15%
2019	75.72	166.66		90.94	54.57%
2018	101.61	182.15		80.54	44.22%
2017	76.69	221.76		145.07	65.42%
2016	82.01	180.4	0	98.39	54.54%
2015	59.03	59.03		0	0.00%
2014	69.45	69.45		0	0.00%
2013	52.86	53.1		0.24	0.45%
2012	83.41	83.41		0	0.00%
2011	56.42	56.42		0	0.00%
2010	68.26	67.4	0.86	0	0.00%

Most of the water loss for the Company is not a revenue loss because the water loss occurs before water is treated. The springs for this system, at the time of this report, are not required to be chlorinated. Water is allowed to overflow the tanks and keeping the water fresh and because of the nature of record keeping, the system shows a high water loss.

3.3. CURRENT WATER MEASUREMENT METHODS

All connections in the system are metered and are read manually every month as weather allows. During the winter season and if the meters are un-readable due to being buried in snow, water usage is assumed and then reconciled upon the next available manual reading. The system's meters were completely replaced in a 2015 construction project with meters that are capable of being upgraded to radio-read technology. Meters are replaced on at the end of their service life or when the meter is damaged.

4. BILLING

The current pricing structure for users of the Boulder Farmstead Culinary Water System is shown below.

Table 7 - Price / Rate Structure

Price	Volume (gallons)
\$48.00	50,000
Additional \$2.00/1,000 gallons	Up to 60,000 gallons total water usage.
Additional \$5.00/1,000 gallons	Water usage above 60,000 gallons.

5. WATER USE

Since 2015, water usage for Boulder Farmstead has risen from about 233 gpcd to 330 gpcd see Table 8 and Figure 5.

Table 8 - Water Use per Capita

Connection Type	2020 Water Use (GPCD)
Residential	263.2
Commercial	14.9
Industrial	0.3
Institutional	51.4
Total	329.8

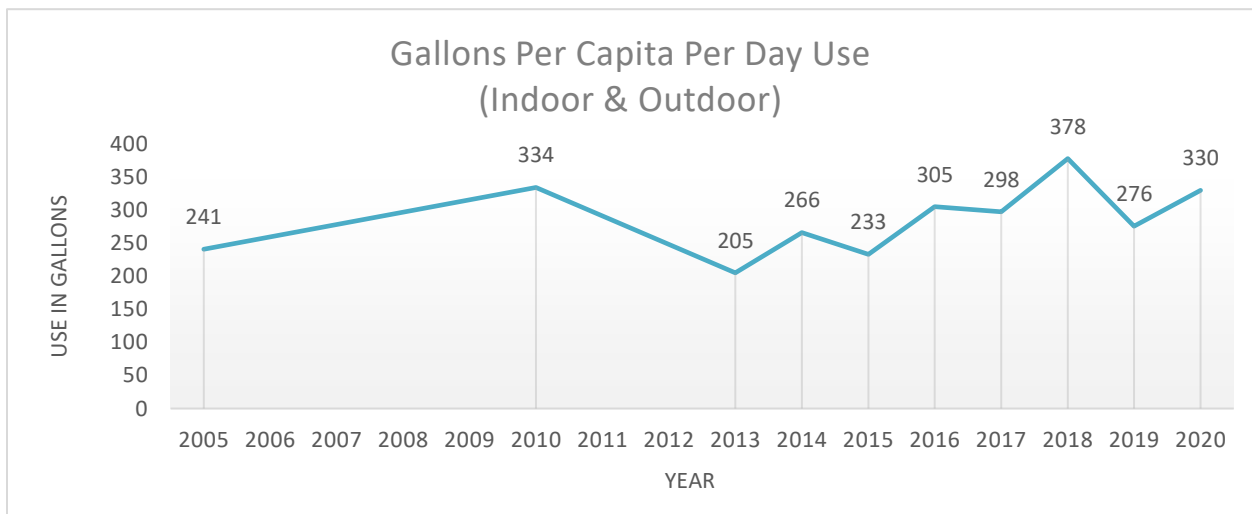


Figure 5 Water Usage per Capita Per Day

Part of the reason for the steady increase is the increase in commercial use. Boulder Town is a popular tourist location and tourism has been increasing yearly. Because tourists aren't accounted for in the population calculations, the gpcd will be artificially higher than the residential usage. The other part of the increased water usage per resident are the several droughts the region has experienced since 2015.

Table 9 - Water Usage without Commercial Connections

Year	Residential Water Use (GPCD)	Total Water Use w/o Commercial (GPCD)
2020	263	315
2019	185	228
2018	291	342
2017	228	270
2016	245	284
2015	176	216

An average of the last 6 years of water use per capita is approximately 231 gpcd for residential use and 276 gpcd for total water use without the seasonal commercial water usage.

6. CONSERVATION PRACTICES

Utah's Regional Municipal and Industrial Water Conservation Goals for Garfield County is 19% from 2015 to 2030, which equates to about 231 gpcd. Currently, residents of the system are meeting the current goal of an average of 231 gpcd. However, Institutional and Commercial users are other major water demands for the company and efforts can be made to bring the overall water usage down to meet the regional goal.

6.1. CURRENT CONSERVATION PRACTICES

From the previous water conservation plan, the Company outlined several measures as goals to help promote conservation and help to solve problems identified with the System. Table 10 outlines each goal with an assessment of the progress made since the last water conservation plan.

Table 10 - Previous Water Conservation Goals

Goal	Status	Current Progress
The Company will keep an accurate account of meter readings. This will aid the Company in educating their users of their usage and promote water conservation based on the type and amount of usage that is occurring.	Completed	The company has regularly recorded and upkept meters to maintain an accurate record of water usage.
Encourage landscaping that requires little water.	Actively in Progress	The company regularly encourages water users to use landscaping that requires little water.
Educate users of conservation methods with their monthly statements.	Completed	The company may review the effectiveness of this program and may start again during the summer months
Keep water rates within the affordability guidelines for the area by the State Division of Drinking Water. High rates will discourage users from keeping nice yards.	Completed	The company strives to maintain affordable water rates through regular reviews of billing rates and water usage.
Jepsen Spring will be repaired and the collection system will be reconstructed in spring of 2015.	Completed	Jepsen Spring was redeveloped to provide more reliable water.
An additional larger diameter pipe will be placed parallel the existing piping throughout much of Service Area 3 to help maintain adequate fire flows and pressures throughout the System.	Completed	In 2015 the system underwent improvements to improve fire flows and pressures throughout the system. Improvements included replacing valves, increasing pipe diameters, and adjusting operating pressures.

6.2. ADDITIONAL CONSERVATION MEASURES – 5 YEARS

The Utah Division of Water Resources (DWRe) has published a list of Best Management Practices (BMPs) for water providers to help promote Water Conservation, which are listed in Table 11. These BMPs help water providers in conservation practices.

Table 11 - Utah DWRe BMPs

#	Practice
BMP 1	Comprehensive Water Conservation Plans
BMP 2	Universal Metering
BMP 3	Incentive Water Conservation Pricing
BMP 4	Water Conservation Ordinances
BMP 5	Water Conservation Coordinator
BMP 6	Public Information Program
BMP 7	System Water Audits, Leak Detection and Repair
BMP 8	Large Landscape Conservation Programs and Incentives
BMP 9	Water Survey Programs for Residential Customers
BMP 10	Plumbing Standards
BMP 11	School Education Programs
BMP 12	Conservation Programs for Commercial, Industrial and Institutional
BMP 13	Reclaimed Water Use
BMP 14	“Smart Controller” Technology

Because the Company is privately owned and provides water to Boulder Town, conservation practices will be based on what the Company can readily implement and practices that the Company will work with Boulder Town to implement. Current conservation measurements include the following:

- 1) Encouraging water users to use landscaping that is native to the area and requires little water.
- 2) Educating users of conservation methods.
 - a) Including appropriate times and amounts for irrigation.
 - b) Replacing old plumbing fixtures.
- 3) Maintaining system integrity through regular system checks.
- 4) Maintain accurate water usage records.

Current and potential future additional measures will be reviewed regularly by the Board and may be implemented or revised as needed and determined by the Board.

6.2.1. IMPLEMENTING AND UPDATING THE WATER CONSERVATION PLAN

Periodic evaluation and review of the Water Management and Conservation Plan will occur as water meter reading provides the Company with good consumptive use data. This will require field checks on

users that are using large amounts of water to determine the cause of excess usage. These users will need to be periodically informed of their usage and educated about appropriate conservation measures.

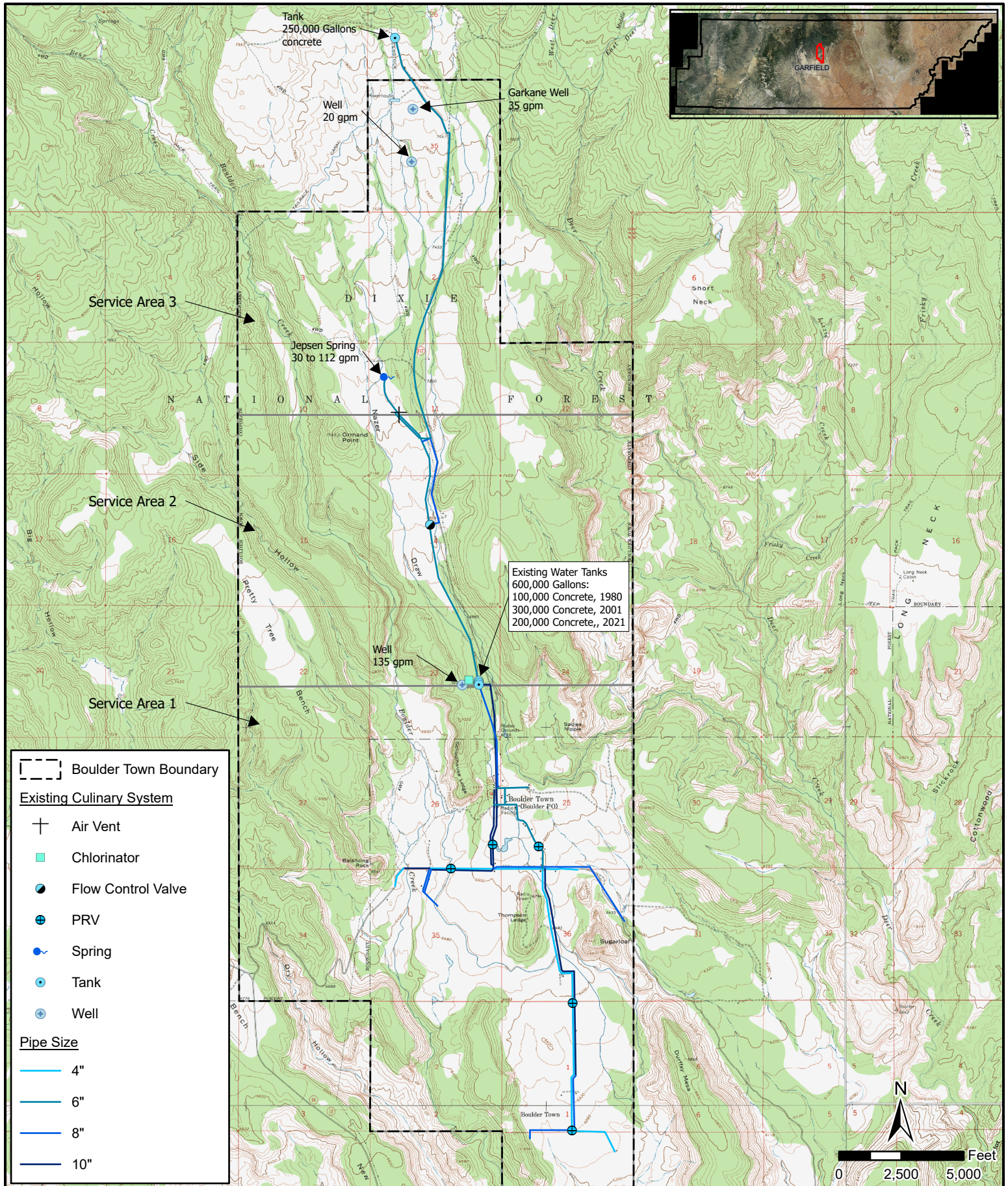
6.3. CONTACT INFORMATION

The Company Officers involved with the adoption and implementation of this plan are:

Connie Reid, President
Cyndy Butcher, Board Member
Randy Catmull, Board Member
Camille Ballard, Board Member
Evonne Roundy, Secretary.

Randy Catmull will be primarily responsible for ensuring these measures are put into place and that education takes place. The Water Management and Conservation Plan will be reviewed and updated, if necessary, every 5 years from the date of adoption.

APPENDIX A. SYSTEM MAP



APPENDIX B. CERTIFICATION OF ADOPTION

I, Connie Reid, the president of Boulder Farmstead Water Company, herby certify that the attached Water Conservation Plan – 2022 has been established and adopted by our board members on the date listed below.

Connie Reid, President

Date