KELLER ASSOCIATES

City of McCammon

Water Facilities Planning Study

November 2020

GROWING POSSIBILITIES

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INTRODUCTION

Purpose and Need for Project

The last Facilities Planning Study for the City of McCammon's water system was completed in 2006. Since that study, the City has done several water line replacement projects and line repairs. Many of the recommendations from the previous study still need to be addressed in the water system. The City commissioned this Water Facilities Planning Study to evaluate and make recommendations for the water system as a whole. The recommendations from this study will allow the City Council to prioritize, plan, and budget system improvements that will address problems from aging and undersized infrastructure and improve system reliability.

Plan of Study and Report Organization

Chapter 1 describes the City of McCammon's existing drinking water system consisting of wells, a tank, and transmission and distribution piping. Chapter 2 describes the existing environmental conditions in the planning area. Chapter 3 outlines the planning criteria which form the basis of the water system evaluation and resulting recommendations. Chapter 4 forecasts water system demands by establishing current production and applying current per capita usage to growth projections.

Chapter 5 describes the results of the water system modeling that was used to identify distribution system deficiencies. Chapter 6 contains a supply, storage, and delivery evaluation for the system. Chapter 7 includes the initial and final screening of alternatives to address deficiencies that were identified in other chapters. Chapter 8 lists prioritized improvements with costs in the Capital Improvement Plan. Chapter 9 is a discussion of funding and user rates.

Project Implementation

The City Council has discussed the recommendations in this study during several City Council meetings. The City understands the current water system and the importance of addressing these deficiencies in a timely manner. The City recognizes the importance of maintaining their water system infrastructure in order to provide reliable drinking water and fire protection to McCammon's residents and businesses.

The City will seek outside funding sources and modify the current user rate to fund the improvements recommended in this study. The City has the technical, financial, and managerial resources to implement the recommendations of this study.

Chapter 1 – EXISTING SYSTYEM

This chapter summarizes existing source, disinfection, storage, and distribution conditions for the City of McCammon's drinking water system. The City's water system, which is described in detail in the following sections, is comprised of one pressure zone, three ground water wells (two for domestic uses), and one water storage tank.

1.1 WATER SOURCES

Residents within the City of McCammon receive culinary water from a community-wide water system. The City water system was installed following World War I. The original water supply source was Crystal Springs, a high mountain spring located several miles east of McCammon. Since then, three wells and a storage tank have been added to the system. The water supply and distribution system are currently owned and operated by the City of McCammon. The quality of the water is considered very good. However, the groundwater wells tend to produce fine sand and are high in dissolved iron. Currently, the system supplies water to 311 connections. A map of McCammon's water system is shown in Figure 1-1.

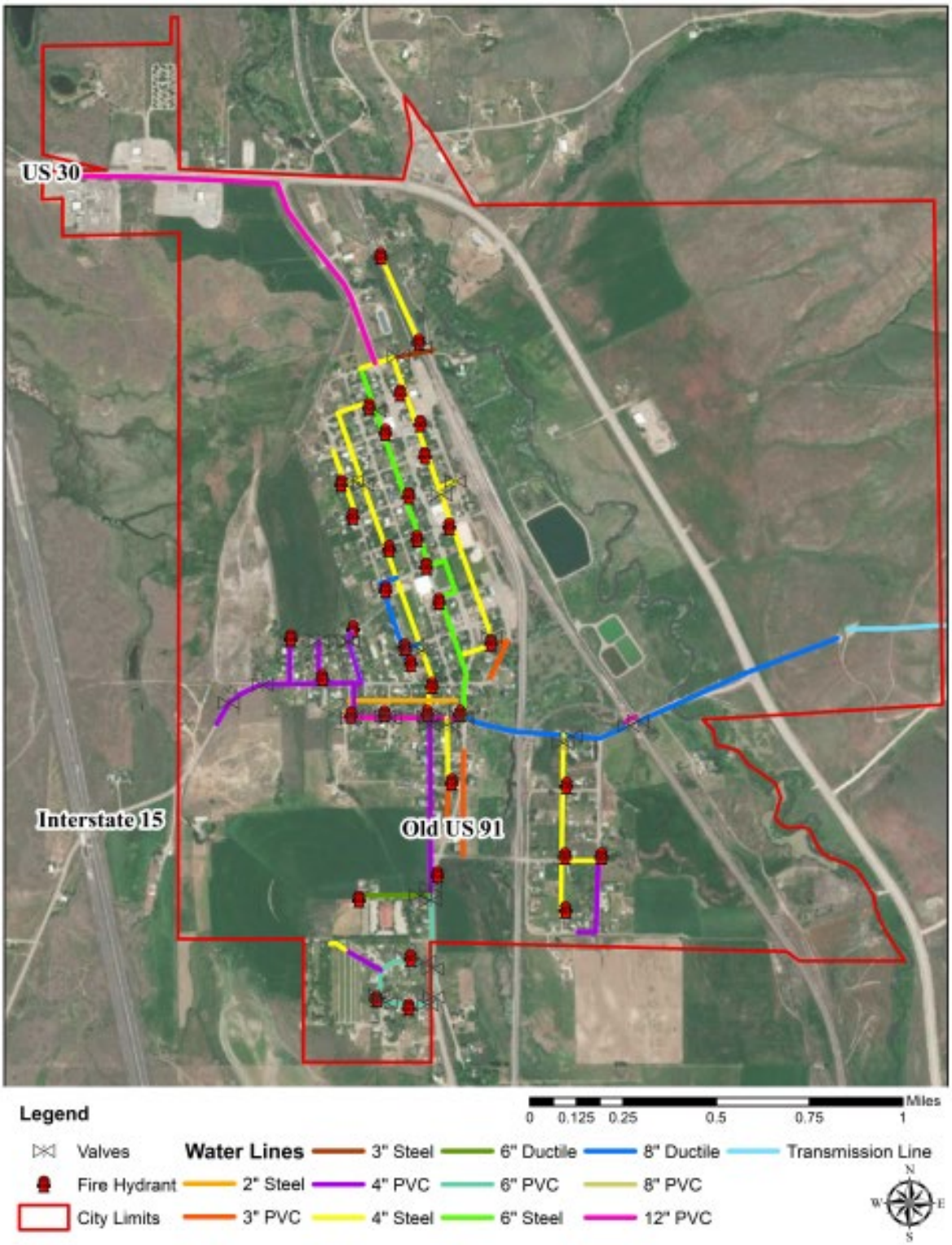


Figure 1-1 McCammon's Existing Water System

The main source of water for the City of McCammon is Crystal Springs, located approximately 3.5 miles east of the storage tank. The spring provides 540 gpm for the City based on the City's water right. The approximate alignment of the spring transmission line is represented on Figure 1-2. At the spring site, the City owns a 100-foot wide by 300-foot long piece of land. This land is fenced by five-foot high steel panels to keep out animals. A map with the location of Crystal Springs is shown in Figure 1-2.

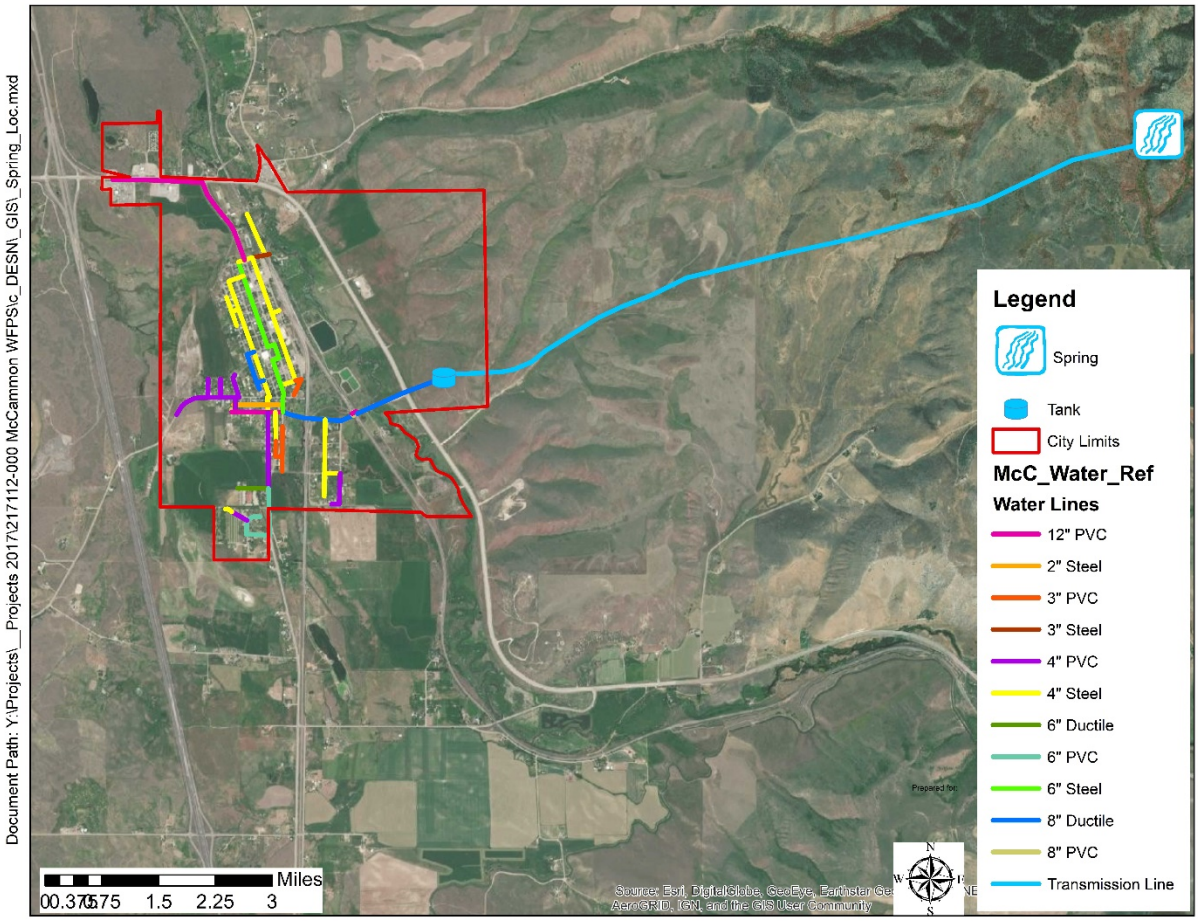


Figure 1-2 Crystal Springs

At the spring, water is collected in two separate collection structures (north/left and south/right) consisting of buried corrugated pipe. Water from both collection structures flows into a large concrete bypass chamber equipped with an overlapping, locking, steel cover from which it flows to the 300,000-gallon water storage tank through a 6-inch cast iron discharge line. The concrete bypass chamber, flow metering manhole and associated piping were built as part of a 1998 construction project. The spring discharge line is equipped with a sample tap and air relief valve. The City holds easements for the spring transmission line allowing them access to the line for maintenance. In addition, the City owns the land where the storage reservoir sits.

The City of McCammon has three wells, two of which are currently used for domestic purposes. The City owns each of the well lots. Well No. 1 is located on the west side of the City, Well No. 2 is located in the park and is not currently being used, and Well No. 3 is located on the south side of the City by the Bitton Subdivision. The wells are currently used only part-time and are shut down and winterized for the winter months. The wells pump directly into the system when the tank level or pressure levels in the system drops below the set point.

Well No. 1, the main reserve well, is located on the west side of town at 2nd West and 12th Street. A block building on the site houses the wellhead, flowmeter, and piping. Well No. 1 was built in 1978 and is 600 feet deep with static water depth at about 104 feet. The well pump delivers approximately 170 gpm. This well does not contain a well screen and the well produces large amounts of sand.

Well No. 3, located on the south end of the City near the McCammon cemetery, was drilled in September 2000 to a depth of approximately 400 feet. The static water depth is about 60 feet, and a 20 HP pump delivers approximately 130 gpm. This well is in process of being upgraded with a 25 HP pump that can pump up to 175 gpm. A metal building houses the flowmeter, valves and piping from the well. This well initially produced a lot of sand but was redeveloped in 2013. The well was deepened to 510 feet and a screen and filter pack were installed from 400 to 500 feet.

The well no longer produces sand but does produce rust-colored water for a few minutes after startup due to dissolved iron in the water. The well can produce a sustained 206 gallons per minute at 191 feet of drawdown based on the pumping test that was completed as part of the well improvements. The operator allows this well to pump to waste for a few minutes in the spring of the year before pumping into the system to allow the water to clear up. The well report that was submitted as part of this project is included in Appendix A.

Photographs of various water system components are included in Figures 1-3 to 1-7.

Figure 1-3 Collection Box at the Spring

Figure 1-4 300,000 Gallon Water Tank

Figure 1-5 Well #1

Figure 1-6 Well #3 (Bitton Well)

Figure 1-7 Well #2

1.2 WATER DISINFECTION

Water from the spring is disinfected upstream of the water storage tank. The disinfection system was installed in 1998 to help curtail coliform contamination in the distribution system. Water from the spring has always been of good quality.

The disinfection system consists of liquid sodium hypochlorite drums and a chemical metering pump. The system is in good working condition. The disinfectant is injected into the transmission line upstream of the water storage tank. Water from the wells is not disinfected or otherwise treated before distribution.

1.3 WATER STORAGE

The City of McCammon maintains a 300,000-gallon water storage tank in the foothills east of the City. The tank's location is shown in Figure 1-2. The storage reservoir, constructed in 1954, is a welded steel ground level tank. The tank was repainted in 1972. The tank exterior was repainted in August 2020.

The tank was last inspected in 2019. The report from this inspection can be found in Appendix A. This inspection included recommendations for helping the tank meet OSHA, EPA, NFPA, and AWWA requirements. These recommendations include:

- Electrically grounding the tank for lightning protection

- Installing a davit arm on the primary shell manway and installing a second shell manway
- Installing anti-skid rung covers and a cable safety device on ladders
- Installing a handrail system on the tank roof with a toe board and swing gate
- Installing a second access hatch and an OSHA compliant interior access ladder
- Clearing around the concrete foundation ring down to a depth of 6”
- Installing proper signage
- Replacing the overflow system
- Replacing the liquid level indicator
- Replacing the roof vent
- Grouting and sealing the tank
- Installing a drain valve
- Pressure washing, scrubbing, spot priming, and painting the tank
- Reinforcing the support column baseplate
- Installing a mixing system
- Cleaning the tank interior
- Re-evaluating the tank interior condition at the next inspection.

The tank is located at an elevation sufficient to provide water pressures in the range of 80 to 95 psi throughout the distribution system when the tank is full. During high demands when the tank is empty, pressure reportedly drops to about 40 psi or less.

For a population of 809, the storage volume available represents about 371 gallons per person. The flow meter for McCammon is located upstream of the tank. All flow to the tank is measured including the overflow that occurs in the tank for most of the year. There is an overflow structure built into the spring transmission line upstream of the flowmeter that was intended to spill when the tank is full, however, the City’s Public Works Director reported that this overflow structure has never functioned as designed. Instead, the tank overflows in the tank’s internal overflow which results in flow being measured through the flowmeter that does not enter the system. This does not allow the City’s average daily water consumption to be calculated. For the purpose of this report, the average water consumption was assumed to be 80 to 100 gallons of water per day per person based on information from the USGS Water Science website for average water usage in the U.S. Fire protection adds to the required amount of storage.

While average day usage cannot be measured due to overflow inside the tank, peak usage can be measured when there is no overflow in the tank as evidenced by Well 1 and/or Well 3 running. These wells only operate when water level in the tank drops below the setpoint. At the current maximum day usage rate of 1,525 gpcd, the storage tank is undersized. The estimated storage deficit for 2020 is 1,750,000 gallons and for 2040 is 2,100,000 gallons as shown in Chapter 6.

1.4 DISTRIBUTION SYSTEM

1.4.1 Piping

A 6-inch transmission line from the spring conveys water to the City's water storage tank. The transmission line from the spring was enlarged during the mid-1930's. Over the past several years, the City has repaired some leaks in the transmission line. On each occasion, the outside and inside of the pipe has appeared to be in good condition. The leaks were caused by the lead joint failing. The City periodically inspects this line for visible problems. It is recommended that the City travel the pipe alignment at least twice per year to look for problems.

An 8-inch transmission line conveys water from the water storage tank to the City. This transmission line runs under US-30 and along 12th Street, crosses under the Portneuf River and multiple sets of railroad tracks, and then branches into the distribution system. This transmission line is the only method of transporting water from the City's storage tank to the City.

The City of McCammon's water distribution system, originally installed in the early 1900's, has been upgraded several times. Some of the original lines from the early 1900's are still in operation. In 2013, approximately 1,200 feet of 12-inch PVC waterline was constructed in 12th Street from Well 1 to Center Street to replace the existing 8-inch waterline and provide a large transmission line from the well to the 6-inch line in Center Street.

In 2018, a new 12-inch waterline was bored under the east set of Union Pacific Railroad tracks coming from Lava Hot Springs to replace the existing 8-inch waterline which was leaking. The 12-inch PVC waterline was installed inside a 24-inch diameter, ½-inch thick steel casing. The new railroad crossing was approximately 125 feet long and the new 12-inch waterline transitioned back to the existing 8-inch waterline on each side of the crossing. Dewatering was required for this project and should be expected for projects constructed in the low-lying areas along the Portneuf River.

In 2020, a new 8-inch waterline was installed along Logan Street from 7th Street nearly to 11th Street. The existing line through the school play field was abandoned. The service lines were replaced, and meter pits were installed. Additional hydrants were installed to improve fire hydrant coverage. The new waterline connected back to the existing 4-inch steel waterlines in the alleys at 7th and 9th Streets between Bannock and Logan Streets.

The remaining waterlines have not been upgraded since the 1930s and most of the water lines are over 50 years old. As a result, much of the distribution system is aged and in need of repair. Much of the piping is welded steel or cast iron with lead joints that are deteriorating, causing leaks throughout the system. An inventory of the distribution system piping is presented in Table 1-1 and Table 1-2.

As shown in Table 1-1, the distribution system consists primarily of 4-inch piping. DEQ requires that distribution piping that supplies fire hydrants be a minimum of 6 inches. Currently, 6-inch piping is only found between Center Street and Bannock Street and in and around the Bitton Acres Subdivision located south of the City. A 12-inch pipeline runs along 12th Street from Well #1 to Center Street and along Center Street and Highway 30 from 1st Street to Flying J. The remaining 55 percent of the piping is 4 inches or less in diameter which prevents the current system from supplying adequate fire flows to the City.

Table 1-1 McCammon Pipe Size Comparison

Size	Quantity (ft)	Percentage
2	1,126	2.7%
3	2,603	6.3%
4	18,929	45.9%
6	7,317	17.8%
8	5,363	13.0%
12	5,875	14.3%

Table 1-2 shows a breakdown of the pipe materials that can be found in the City of McCammon. This table gives a good indication of the amount of water pipe that is approaching the end of its useful life. The highest percentage of piping is steel. PVC pipe represents the most recent water pipe installed in the City. Most of the steel and cast-iron pipe in the City is between 50 and 100 years old.

Table 1-2 McCammon Pipe Material Comparison

Material	Quantity (ft)	Percentage
Cast Iron	5,027	12.2%
PVC	18,424	44.7%
Steel	17,762	43.1%

The current state of McCammon's distribution system raises several potential health concerns. Leaking pipes and joints are vulnerable to contamination in the event of a loss of system pressure. The lead joints and goosenecks which are found throughout the City's distribution system can potentially cause unsafe levels of lead to leach into the water. The current water

system contains several dead-end lines, which causes water stagnation in the lines and increases the opportunity for bacterial growth. These items cause a concern, but no test results have shown high lead concentrations or bacteria levels in the drinking water.

1.4.2 Hydrants

The system includes 37 fire hydrants and 35 known isolation valves. Of all the fire hydrants, 17 are connected to 6-inch pipe or larger. Most of the fire hydrants in the City of McCammon are older models, many of which are damaged or in poor condition. The isolation valves are in fair condition but are too few to adequately isolate the system. Some portions of the system cannot be isolated without shutting down up to one-third of the water system. The current distribution system also contains several dead-end lines that do not have hydrants or blow-offs for flushing. Dead ends limit water supply to these areas resulting in low pressure and potential stagnant water zones.

Fire flow testing was performed in June 2019 throughout the City. The flows in the City are insufficient to provide adequate fire protection for the City of McCammon and could potentially cause negative pressures in the system if a fire truck were to pump water from a hydrant during a high-water demand period. Such a scenario combined with the lack of backflow prevention valves in the distribution system poses serious health risks due to the potential of siphoning from a contaminated water source (i.e. fish tank or watering trough).

Hydrant coverage across the City was evaluated to identify gaps in access to fire hydrants during an emergency. Figure 1-8 shows hydrant coverage based on the location of hydrants with a service radius of 350-ft. The City currently does not have adequate hydrant coverage in some areas. The City should look to install additional hydrants to fill in the gaps shown in Figure 1-8.

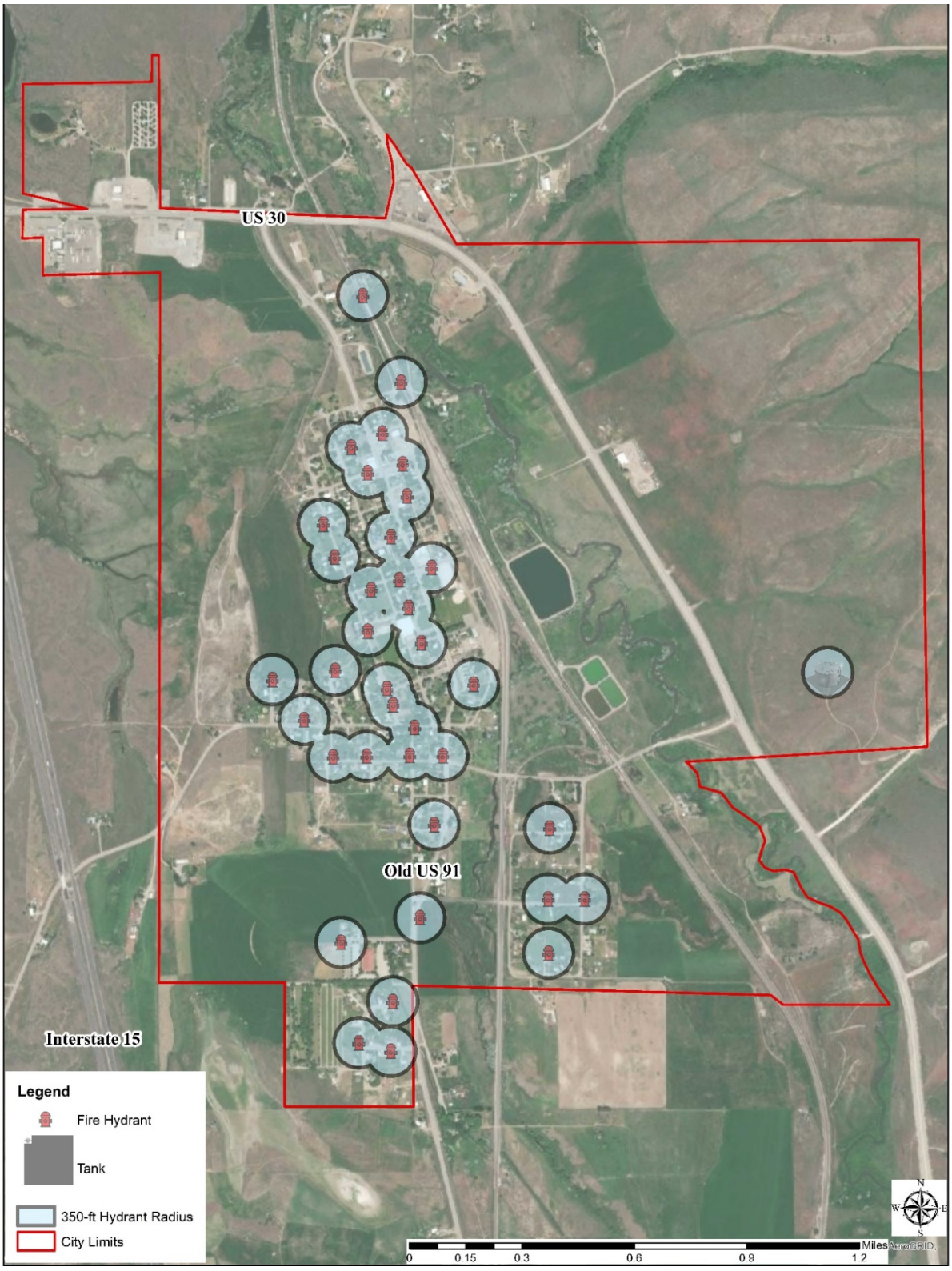


Figure 1-8 McCammon Hydrant Coverage

1.4.3 Meters

McCammon currently meters three businesses. They also require all new construction to install a water meter pit to allow them to install water meters in the future.

1.5 WATER QUALITY

Water quality is based on the EPA Safe Drinking Water Standards, which include primary standards (legally enforceable) and secondary standards (non-enforceable guidelines). The intent of the primary standards is to protect public health, while secondary standards suggest guidelines for maximum levels of contaminants that pose no health risk, but may cause corrosion, odor, unpleasant taste, or staining (cosmetic and aesthetic effects).

The primary standards regulate a list of contaminants that have been identified as harmful to humans if consumed. All public water supply sources are required to meet primary water quality standards for the regulated contaminants. In addition to microorganisms, the primary standards include certain inorganic chemicals (IOC), synthetic organic chemicals (SOC) and volatile organic chemicals (VOC).

Water samples from the City of McCammon's system are tested monthly for bacterial contamination. A summary of chemical analyses of McCammon's water sources is shown in Table 1-3. All tested synthetic and volatile organic chemical constituents were reported as "Non-Detect" (ND). The detected levels for nitrates, inorganic chemicals, radionuclides, and other contaminants were well below the Maximum Contaminant Levels (MCLs) set by EPA. As shown in the table, McCammon's water supply meets EPA primary standards for all of the contaminants monitored. Iron content did not meet the secondary standard. It was measured at 0.6 mg/L which is high enough to stain clothing. Available water quality data is contained in the Consumer Confidence Reports in Appendix C.

Table 1-3 Chemical Analysis of McCammon's Water

Regulated Contaminant	MCLG	MCL	City's Water	Sample Date	Exceedance /Violation	Typical Source of Contaminant
Gross Alpha (pCi/L)	0	15	0.484	8-18-16	No	Naturally occurring
Uranium (pCi/L)	0	30	1.77	8-6-19	No	Naturally occurring
Lead (ppb)	0	15AL	2.0	8-31-17	No	Corrosive water & home plumbing
Copper (ppm)	1.3	1.3AL	0.042	8-31-17	No	Corrosive water & home plumbing
Fluoride (ppm)	4	4	0.40	8-6-19	No	Naturally occurring
Barium (ppm)	2	2	0.217	9-11-19	No	Naturally occurring
Arsenic (ppb)	0	10	2.0	8-6-19	No	Natural deposits, orchards, glass, & electronic production wastes
Chromium (ppb)	100	100	3.0	8-6-19	No	Naturally occurring
Radium 226/228	0	5	0.741	8-6-19	No	Naturally occurring

The Bitton Well was unusable due to the amount of sand it produced. In 2013, the City deepened the well and installed a screen and sand pack. The well now produces a small amount of sand at start up but is not measurable after 10 minutes of pumping.

1.6 WATER RIGHTS

The City of McCammon currently has priority water rights of 1.2 cfs (540 gpm) from Crystal Springs. In addition, they also have water rights for the wells that they currently operate. Table 1-4 lists water rights owned by the City of McCammon.

Table 1-4 McCammon Water Rights

Water Right No.	Priority Date	Water Use	Diversion Rate (cfs)	Source	Point of Diversion
29-13224	7/1/1892	Municipal	0.7	Crystal Springs	SENWSE S3, T9S, R37E
29-224	6/17/1902	Municipal	0.5	Crystal Springs, West Bob Smith Creek	SWSW S3, T9S, R37E
29-7370	4/28/1977	Municipal	0.36	Groundwater	SESW S12, T9S, R36E
29-7834	7/15/1987	Municipal	0.2	Groundwater	SWSE S12, T9S, R36E
29-8226	1/24/2005	Municipal	1	Groundwater	NESW S13, T9S, R36E

Currently, the maximum water production for McCammon includes 540 gpm from Crystal Springs and approximately 170 gpm from Well #1 and 130 gpm Well #3. Average water usage in the City of McCammon is not known since not all flow is metered. The only flow data comes from flow meters on the wells and a flow meter on the line entering into the tank. Overflow from the tank is not measured.

1.7 USER RATES & BUDGET

The City of McCammon charges a fee of $38 per month for unmetered water service for each equivalent user. An equivalent user is considered one residential connection. Commercial development considered as one equivalent user includes assembly halls, bars (<26 seats, no cafe), beauty shops (<6 chairs), maintenance shops, offices (<21 employees), and stores or businesses (<11 employees). Other connections vary in their equivalent user determination depending on the number of units (apartments, hotels), beds (hospitals), residents (rest homes), students (schools), seats (cafes), etc. Currently, the City of McCammon has 311 equivalent users, of these, 287 are residential. The total annual revenue generated from water charges was $173,006 in FY 2018. The revenue statement for the City of McCammon over the last 5 years are included in Appendix B.

1.8 OPERATION & MAINTENANCE CONDITIONS

Operation and maintenance can be defined as the prudent and necessary tasks to operate and maintain the water treatment (disinfection) processes, groundwater supply sources,

transmission lines, booster pumping, storage, distribution facilities and networks, and provide customer service. Examples of specific O&M activities include fire hydrant maintenance, record keeping, disinfection system maintenance, pump maintenance and repair, leak repair, service connection and water meter maintenance/replacement, and cross connection control.

1.9 CROSS CONNECTION CONTROL

The City of McCammon has a cross connection control ordinance for connections to the water system. A cross connection control program should take reasonable and prudent measures to prevent unsafe or contaminating materials from being discharged or drawn into the drinking water system. This can occur from pipes, pumps, hydrants, water loading stations, or tanks. The cross connection control program should include provisions for evaluating the existing system and connections, addressing connections without backflow prevention, controlling new connections, testing of backflow preventers by a licensed backflow tester, and ensuring enforcement of the program. The cross connection control ordinance can be found in Appendix A.

1.10 SANITARY SURVEY

The most recent sanitary survey for McCammon's water system was conducted on June 2, 2015. A copy of the sanitary survey can be found in Appendix A. No Significant Deficiencies were identified as defined by IDAPA 58.01.08.003.131. The following Deficiencies were identified: no substitute charge operator, spring not protected from contamination, inadequate ventilation in pump house #1 or #3, no auxiliary power for well #1, well #3, or the chlorinator, fire hydrants connected to water mains smaller than six inches, no cross connection control program for the system, no expanded metal screen in the storage tank overflow pipe, no smooth nosed sample tap before and after treatment, inadequate ventilation in chlorinator building, chlorinator is not an automatic proportioning model, no operation and maintenance manual for the system, and unused wells that need to be abandoned. Some of these deficiencies have been addressed since the sanitary survey was conducted.

The sanitary survey listed the following recommendations: implementing a leak detection program, setting up a water conservation program, and flushing main lines annually.

1.11 PRESSURIZED IRRIGATION SYSTEM

The City of McCammon does not have a public pressurized irrigation system for non-potable uses. Pressurized irrigation systems can help communities stretch valuable municipal water rights by distributing surface water for irrigation needs. Pressurized irrigation systems are not required to meet potable water standards.

Chapter 3 – PLANNING CRITERIA

3.1 WATER RIGHTS

The water supply and corresponding water rights need to provide the peak hour demand (PHD) if equalization storage is not provided. If sufficient equalization storage exists to make up the difference between PHD and max day demand (MDD), the system only needs to have sufficient water rights to supply the MDD. The practice of proper water management would also imply that water rights are secured or are being pursued to meet future demands. Water rights and storage implications will be discussed further in the following sections and in Chapter 6.

3.2 WATER SUPPLY

McCammon supplies drinking water to their residents by a spring and by pumping groundwater wells. IDAPA rules state that all community water systems shall have at least two water sources if they serve more than 25 connections or equivalent dwelling units (EDUs). The ground water sources must be able to meet either PHD or a minimum of MDD supplemented with equalization storage, and these conditions must be met with any one water source out of service (IDAPA 58.01.08.501.17)**Error! Bookmark not defined.**. The total source capacity with the largest source (pump) out of service is called the system's "firm capacity." New sources should be obtained such that the system's firm capacity meets or exceeds the conditions above.

During a power outage, if the ground water source pumps are the sole means of delivering water to the system (i.e. no storage or booster pumps), the ground water source pumps must be able to supply average day demand (ADD) for a period of 8-hours plus fire flows, utilizing either the well sources with emergency power (such as with a backup generator) or a stand-by storage component (IDAPA 58.01.08.501.07)**Error! Bookmark not defined.**.

3.3 WATER STORAGE

It is recommended that minimum storage capacity be equal to the operational, equalization, dead, fire suppression, and standby storage needs of the system[1]. A description of these storage components follows:

Operational storage refers to the difference in the tank level from when the pump(s) filling the tank turn on, to when they turn off. This volume has the potential to change throughout the year depending on system demands and water stagnation, but typically this is around 10% of the total storage volume.

[1] American Water Works Association. (2012b). Computer Modeling of Water Distribution Systems. In *M32.* American Water Works Association.

Equalization storage is quantified by the volume of water consumed by the City during high demand times of day that exceed the firm capacity of the system's sources. Equalization storage is a function of the City's diurnal demand pattern. The typical diurnal curve in Figure 3-1 illustrates how equalization storage makes up the difference between demand and firm supply.

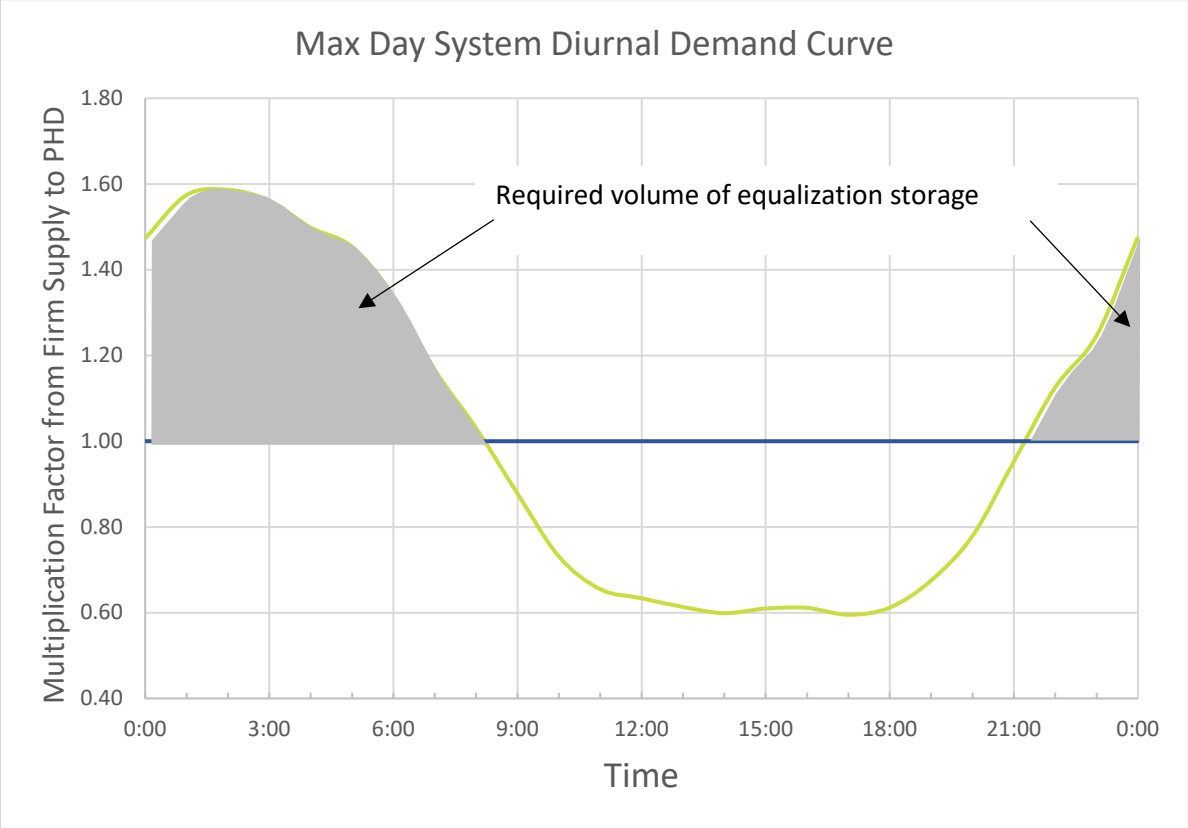


Figure 3-1 Typical Diurnal Curve

Dead storage is storage that is either not available for use in the system (e.g. lies below the tank's outlet elevation) or can provide only substandard flows and pressures.

Fire suppression storage is the volume required for City fire protection to fight a fire at the flows and duration recommended by the local fire marshal, the international fire code, or the Idaho Surveying and Rating Bureau (ISRB). The range of flows and locations requiring these flows throughout the City are listed in Table 3-1. The correspondence with ISRB can be found in Appendix B. The highest requirement reported by the ISRB is 4,000 gpm for four hours at the elementary school. This fire flow requirement equates to 960,000 gallons.

Table 3-1 McCammon Fire Flow Requirements

Building	Flow (GPM)	Duration (hrs)
School	4,000	4
Church	3,000	3
Welding Shop	1,500	2
Café	1,500	2
Residence/Other	1,250	2

Standby storage is an adjustable volume based on the system susceptibility to extenuating circumstances or unanticipated emergencies such as extended power outages or main line ruptures. IDEQ requires that a system be able to deliver average day demand (ADD) for a period of 8 hours during a power outage. Having emergency power for booster pumps and well pumps can mitigate the need for this storage.

Water storage is typically evaluated using a 20-year planning horizon understanding that the storage structure will have a 50-year design life.

3.4 WATER DELIVERY

Water delivery is the system's ability to supply water at the flows demanded by the end users and at the pressures required by IDEQ. For McCammon's system, the ability to deliver water is dependent upon the relationship between the water sources, water storage, and transmission and distribution pipelines.

As specified in IDAPA 58.01.08.552, IDEQ requires a minimum design working pressure of 40 psi (excluding fire flows). During a fire suppression event, the pressure shall not be less than 20 psi anywhere in the distribution system. If the pressures drop below 20 psi, there is an increased risk of contamination of the drinking water. The water system should also be protected against high pressures. State code requires that static pressure in the system be kept below 100 psi, and ordinarily below 80 psi. For pressures above 80 psi, the Uniform Plumbing Code requires that individual pressure regulators be installed at residences[2]. When system pressures exceed 100 psi, special provisions for mainline materials and construction should be considered[3].

[2] International Association of Plumbing and Mechanical Officials. (2015). 2015 Uniform Plumbing Code. Retrieved December 6, 2017 from http://codes.iapmo.org/home.aspx?code=UPC.
[3] Idaho Department of Environmental Quality. (2016). Idaho Rules for Public Drinking Water Systems. Retrieved June 8, 2017 from https://adminrules.idaho.gov/rules/2016/58/0108.pdf

A municipal water system needs to have the capacity to deliver water to satisfy pressure requirements during the specified demand events as described above. Booster pump stations and well pumps are sized to deliver water at the desired pressure and flow to a defined area.

If no equalization storage component exists within a system, the pumps and spring in combination must be able to produce the PHD. If a storage component exists, as is the current mode of operation in McCammon, and equalization storage is sized properly, the source must be able to supply at least the MDD. IDAPA 58.01.08.541.04 states that these delivery requirements must be met with any source out of service.

In general, there are two types of storage components that can provide equalization storage to maintain flow and pressure as required in Table 3.1:

- An elevated storage tank (either a high-level ground tank or a structurally elevated tank) develops the required pressures by virtue of the tank elevation. In McCammon's system, there is a high-level ground tank located on the foothill east of the city.

- A ground level tank with booster pumps to supply flow and pressure to the system. With ground level storage, the booster pumps must be able to supply peak hour demands with any source out of service. This type of storage is not currently used in McCammon.

The size and "looping" of the distribution and transmission pipelines within a system will affect the ability of the pumping and storage facilities to maintain pressure throughout the system. If a pipeline is not adequately sized, the water velocity in the pipe increases to meet the imposed demand. As pipeline velocities increase, there is a decrease in pressure due to increased friction losses in the pipe. Appropriate "looping" of the distribution system and adequately sized pipes allow water to reach any one location from multiple directions and will result in better pressure. Looping also prevents water from stagnating in dead-end lines that can lead to water quality problems.

3.5 WATER TRANSMISSION AND DISTRIBUTION

Transmission lines are those water mains that primarily allow movement of water from one area of the system to another with relatively few end-use connections between. Transmission lines then feed distribution lines, which carry water to various end-users. The adequacy of transmission and distribution lines is a combination of physical condition and hydraulic capacity.

Physical condition is affected by age, environmental factors (such as corrosive soils), pipe material, water chemistry, and quality of installation. City crews are often well aware of the pipes in their system that have physical problems. Problem areas may require frequent repairs relative

to the rest of the system. This study relied on input from the McCammon Public Works Department to identify pipelines with physical issues.

Hydraulic capacity refers to the system's ability to move water to where it is needed without causing issues for pressure, quality, reliability, or efficiency. Whereas the previously described evaluations of supply, storage, and delivery evaluate system-wide needs, a hydraulic analysis of the system is likely to identify needs that are area specific. Hydraulic analysis is typically performed using hydraulic computer modeling software. A further description of hydraulic analysis criteria, procedure, and results is presented in Chapter 5.

There are many undeveloped areas surrounding the City of McCammon which will require water pipelines to be extended to serve them as the community grows and expands. These pipelines should be large enough to deliver maximum day demands and fire protection demands while maintaining adequate system pressures and maintaining relatively low velocities in the pipe. The following are additional design criteria that are recommended when extending new waterlines to these areas:

- The distribution system must be capable of delivering fire demands while maintaining 20 psi residual pressure throughout the system.
- Pipeline diameters should not restrict the system from delivering PHD while maintaining 40 psi throughout the system.
- Fire demands for residential areas are typically between 1,250 and 1,500 gpm.
- Fire demands for commercial and industrial areas are typically between 1,500 and 4,000 gpm, particularly if fire sprinklers are not present or required.
- Build-out demands should be considered in sizing new waterlines, due to the potential 75+ year life of the pipe.
- As a general rule for new residential development, Keller Associates recommends a grid layout with 12-inch pipelines on section lines (mile), 10-inch pipelines on half-section lines (half-mile), and 8-inch distribution system piping within that grid. Areas zoned for commercial or industrial development may require larger pipelines.
- As a general rule for water line replacement, Keller Associates recommends the following for minimum water line sizes:

    a) 24-inch or parallel line equivalent for any future storage to transmission lines
    b) 16-inch or parallel line equivalent for transmission lines into commercial and industrial zones and along section lines.

- Approving new development with these guidelines in mind provides a network of larger diameter lines that have capacity carry flow effectively to areas within the survey section. The City may consider paying the developer for the difference in cost between a standard 8-inch distribution line and an upsized transmission line.

- In preparing the Facilities Planning Study, some pipelines may be oversized to allow for flexibility in future land use and where future development is expected to occur.

3.6 FIRE PROTECTION

Fire flow requirements are dictated by size, spacing, type of construction, and building use. Typical residential housing requires 1,250-1,500 gpm. The McCammon Fire Chief was contacted regarding required fire flows in the City. He indicated that the study should target 1,500 gpm for residential fire flow demands. The Idaho Surveying and Rating Bureau (ISRB) specifies higher fire flow recommendations for specific buildings within the city. Table 3.1 lists needed fire flow values for locations listed by ISRB that are higher than the lowest residential threshold of 1,250 gpm.

Chapter 4 – SYSTEM DEMAND FORECAST

This chapter will evaluate the existing and future demands on the City of McCammon's water system.

4.1 METHODOLOGY

Demand forecasts were determined using existing use, population, and household data. A review of different methodologies and available data was conducted to determine the best approach to estimate existing and future demands. Keller Associates worked with City staff to review actual operational data and develop future demand estimates that reflect historical demand growth but still provide a modest amount of conservatism. In determining existing and future demands, the following methodology was used:

1. Historical system demands from 2018-2019 were used to define the existing average day and peak day water usage for the system.
2. Recent flow meter data from the spring and SCADA data from the period July 1, 2019 through August 18, 2019 was reviewed to determine during high demand periods. This information was used to estimate the peak hour demand and peaking storage needs.
3. Existing demands per household and household population densities were used to project future demands.

4.2 POPULATION & HOUSEHOLD DATA

Information from census data gathered by the US Census Bureau was used to project growth. Historical data along with trends in the County were used to determine a growth rate that was appropriate for the City. Table 4-1 summarizes the historical growth rates from 1950 through 2010. On average, the City has maintained approximately 0.75% growth over the last 60 years.

Table 4-1 Historical Population and Growth Rates

Year	Population	Growth Rate
1950	578	1.67%
1960	557	-0.37%
1970	623	1.12%
1980	770	2.12%
1990	722	-0.64%
2000	805	1.09%
2010	809	0.05%

It was determined that for the purposes of this study and to be conservative, calculations for the projected future were calculated using a 1.1% growth rate. Figure 4-1 illustrates the projections of the City of McCammon. In 2040, the population of McCammon will be approximately 1,125 people based on projections.

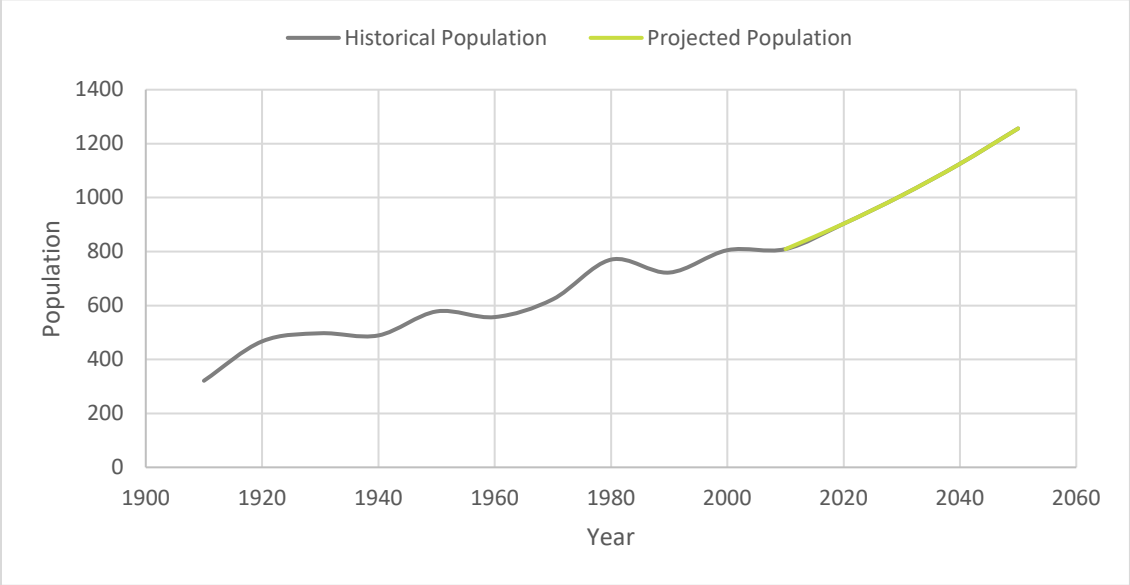


Figure 4-1 McCammon Population Projection

4.3 WATER PRODUCTION DATA & EXISTING DEMAND SUMMARY

Data from the City's Spring flow meter and the flow meters on the wells were used to estimate the water demand for the residents of McCammon. The flow data from July and August 2019 can be found in Appendix B. The data from early fall to late spring is not reliable as the wells are not operating, and SCADA data showed that the tank was overflowing 90% of the time. Based on the well and spring flow data from July and August 2019, a peak hour and peak day were estimated. Max day demand was 870 gpm, and peak hour demand was 891 gpm.

4.4 WATER METER DATA

The City of McCammon does not currently require the installation of meters. To qualify for USDA-Rural Development funding, the City will need to install meters for all connections. Several businesses in the City have meters installed, and recent distribution line replacement projects have included the installation of meter pits. Installing meters throughout the City will help provide more reliable water usage data and provide for better management of the water system.

4.5 WATER DEMAND FORECAST

A demand of 406 gpcd was used to forecast the demand in McCammon if meters are implemented. This amount is an average obtained from data collected from cities that have existing meters. Table 4-2 summarizes the forecasted water demands up to 2050.

Table 4-2 Forecasted Water Demands with Metering

Year	Forecasted Population	Max Day Demand (gpm)
2020	849	513
2030	947	572
2040	1057	639
2050	1180	713

Chapter 2 – ENVIRONMENTAL CONSIDERATIONS

2.1 PLANNING AREA

McCammon is situated on a small knoll bounded by the Portneuf River on the east, Interstate 15 on the west, and U.S. Highway 30 on the north. The Union Pacific Railroad runs between the river and the residential area of the City. The planning area of this study includes the area shown in Figure 2-1. This area includes City limits and surrounding areas where future residential, commercial, and industrial growth is likely to occur.

Figure 2-1: McCammon Planning Area

2.2 ENVIRONMENTAL CONDITIONS

2.2.1 Physiography & Topography

The planning area is located in the Marsh Valley, which is situated between the Bannock and Portneuf Ranges. The topography in McCammon is mostly flat. Elevations in the City vary from 4,740 at the north end of the City to 4,800 at the south end. The slope averages 0.6%. The mountains east of the City slope at 8% for several thousand feet then steepen to a slope of 25%.

2.2.2 Soils and Geology

Soils in McCammon were primarily formed by wind-deposited materials and river alluvium and are generally very deep and well-drained. Near the spring, soils are classified as Ririe-Watercanyon complex (silt loams) and Cedarhill, high precipitation-Hondoho-Arbone complex, comprised of cobbly and gravelly silt loams. Most of the soil within the City limits is classified as Downey-Arimo complex, which is comprised of gravelly silt loam and silt loam. Near the wells, soils are Arimo or Downey-Arimo complex silt loams. Typical profiles of these soils are shown in Table 2-1. A map from “Soil Survey of Bannock County Area, Idaho”, is included in Appendix C.

Table 2-1 McCammon Soil Types

Classification	Depth	Soil Description
Ririe	0-12”	Brown silt loam
	12-60”	Pale brown/very pale brown calcareous silt loam
Watercanyon	0-7”	Pale brown calcareous silt loam
	7-16”	Pale brown calcareous silt loam subsoil
	16-60”	Pale brown/light gray/v. pale brown calcareous silt loam
Cedarhill, hi precip	0-9”	Brown calcareous very cobbly silt loam
	9-28”	Pale brown/lt. yellow brown calcareous v. cobbly silt loam
	28-60”	Lt. yellowish brown, calcareous v. cobbly loam
Hondoho	0-8”	Grayish brown cobbly silt loam
	8-15”	Brown calcareous cobbly silt loam
	15-60”	Lt. yellow brown/pale brown calcareous v. cobbly sandy clay loam
Arbone	0-9”	Grayish brown gravelly silt loam
	9-18”	Brown/pale brown calcareous gravelly silt loam
	18-60”	Very pale brown calcareous gravelly silt loam
Arimo	0-6”	Grayish brown silt loam
	6-18”	Brown silt loam
	18-33”	White calcareous silt loam
	to 60”	Calcareous extremely gravelly coarse sand
Downey	0-12”	Brown gravelly silt loam
	12-17”	Very pale brown gravelly silt loam
	17-32”	Multicolored extremely gravelly coarse sand

2.2.3 Surface & Groundwater Hydrology

Groundwater levels in the area near the river have been recorded as shallow at 2 feet below ground to 6 to 8 feet below ground. West of the railroad, where ground elevations are 10 to 20 feet higher, groundwater is correspondingly deeper. The main City wells are located west of the Portneuf River as shown in Figure 2-2. A more detailed report of the area hydrology has been completed in the Preliminary Hydrogeologic Study for the Town of McCammon which was written by the Idaho Water Resource Research Institute. A copy of this report has been included in Appendix C.

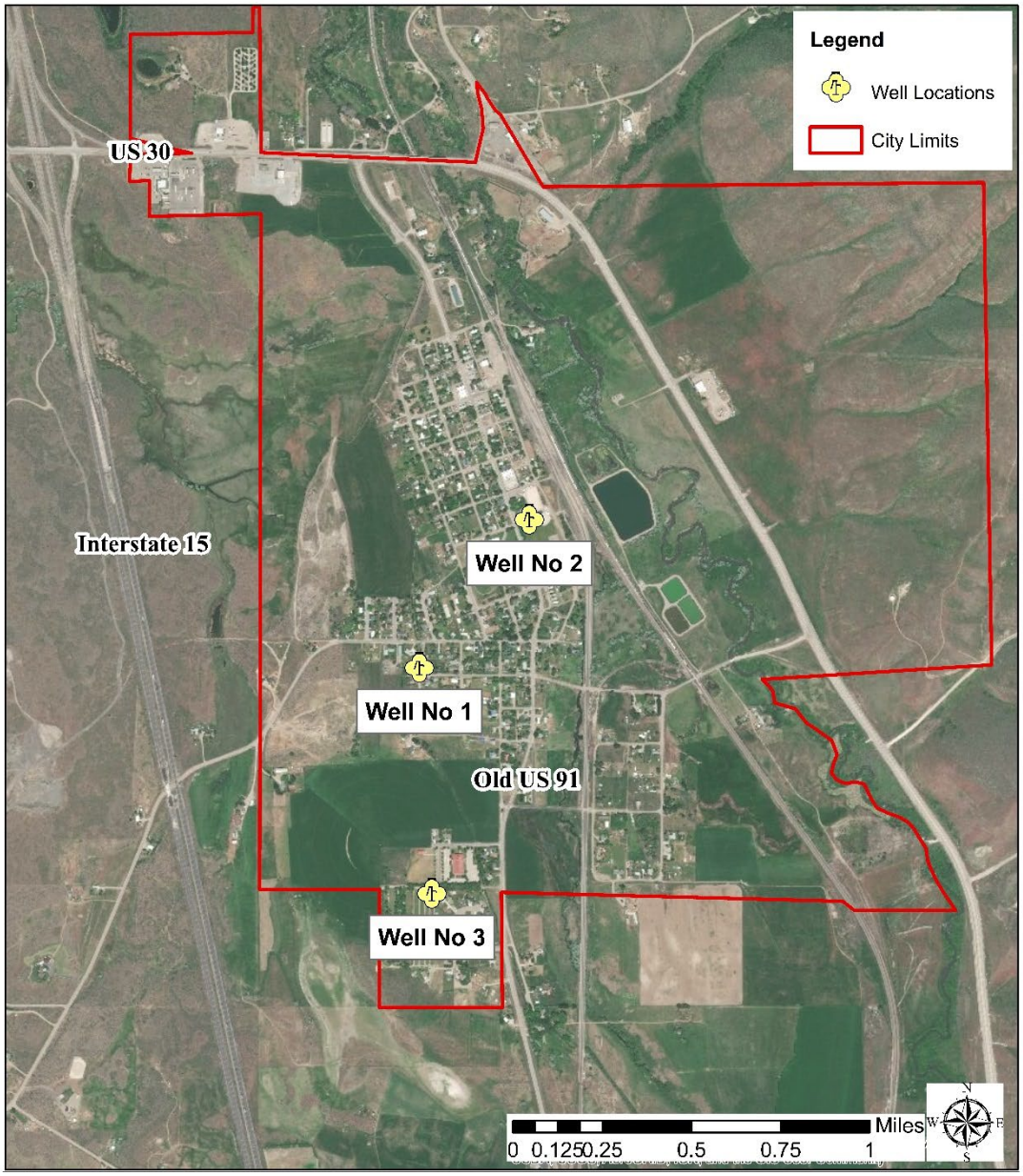


Figure 2-2 McCammon Well Locations

2.2.4 Fauna, Flora, & Natural Communities

The Natural Resource Conservation Service lists 3 plants in Bannock County that are on the threatened or endangered list. The U.S. Fish & Wildlife Service lists 1 plant and 1 animal as threatened. See Table 2-2 for the list of threatened or endangered species. The threatened and endangered species lists from the Natural Resource Conservation Service and the U.S. Fish & Wildlife Service can be found in Appendix C. With construction taking place within the City in previously disturbed areas, the plants and animal listed would not be affected.

Table 2-2 Threatened & Endangered Plants

Scientific Name	Federal Status
Astragalus eremiticus	Endangered
Howellia aquatilis	Threatened
Mirabilis macfarlanei	Threatened
	https://plants.usda.gov/
Spiranthes diluvialis	Threatened
Coccyzus americanus	Threatened
	https://ecos.fws.gov

2.2.5 Land Use & Development

The land in the planning area is a mixture of developed and farmland. A portion on the north end and east side of town is zoned for commercial/Industrial use. These areas can be seen in Figure 2-3.

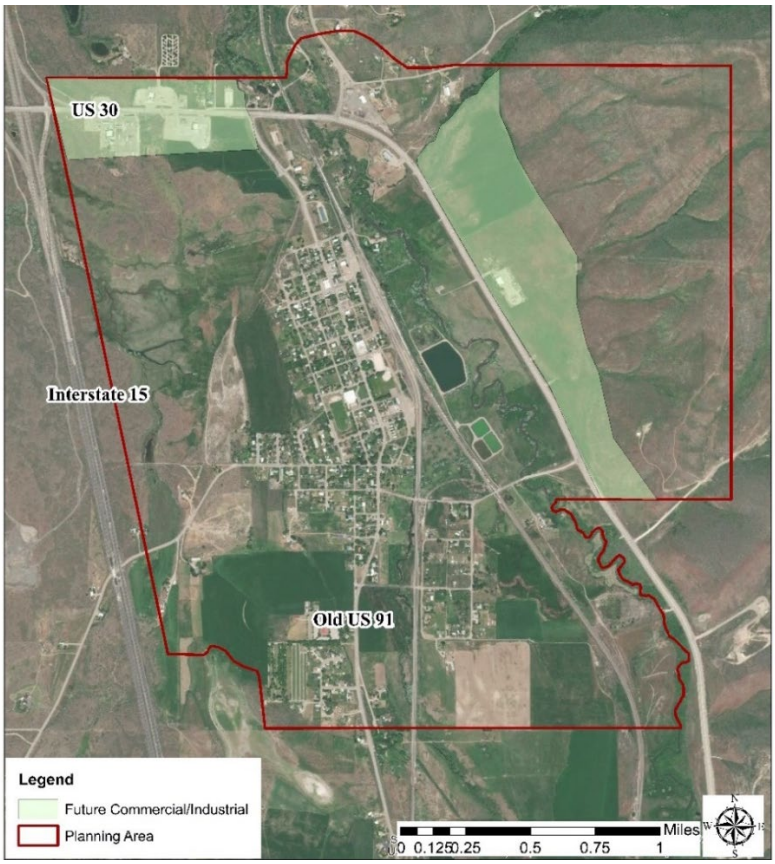


Figure 2-3 Commercial/Industrial Zoning

2.2.6 Cultural Resources

The National Register of Historical Places lists the McCammon State Bank building as a historical resource in the planning area. No archeological sites are listed for the planning area. However, Section 106 of the National Historical Preservation Act covers other buildings/sites in the area that may qualify as historical places.

2.2.7 Utility Use

The majority of culinary water for the City of McCammon is supplied by the spring. A gravity transmission line transports the water through a flow meter and then into the tank. The tank sits above the City and does not require pumps for pressurizing the system. This allows the City to minimize electrical costs. During peak demand when the wells are also utilized, the City has the wells set up on a SCADA system to ensure the pumps come on only when needed.

The City requires meter pits be installed on all new builds and meters three businesses in the City. These efforts were put into place to make it easier to implement metering for the entire system in the future.

2.2.8 Flood Plains & Wetlands

The flood plain near the City of McCammon is located along the banks of the Portneuf River. A 100-year flood event could potentially inundate part of the east portion of the City with 1 foot of water. Flood Insurance Rate Maps (FIRM) for McCammon and surrounding areas are included in Appendix C.

Wetlands located in the area can be seen in Figure 2-4. A description of wetland classifications can be found in Appendix C.

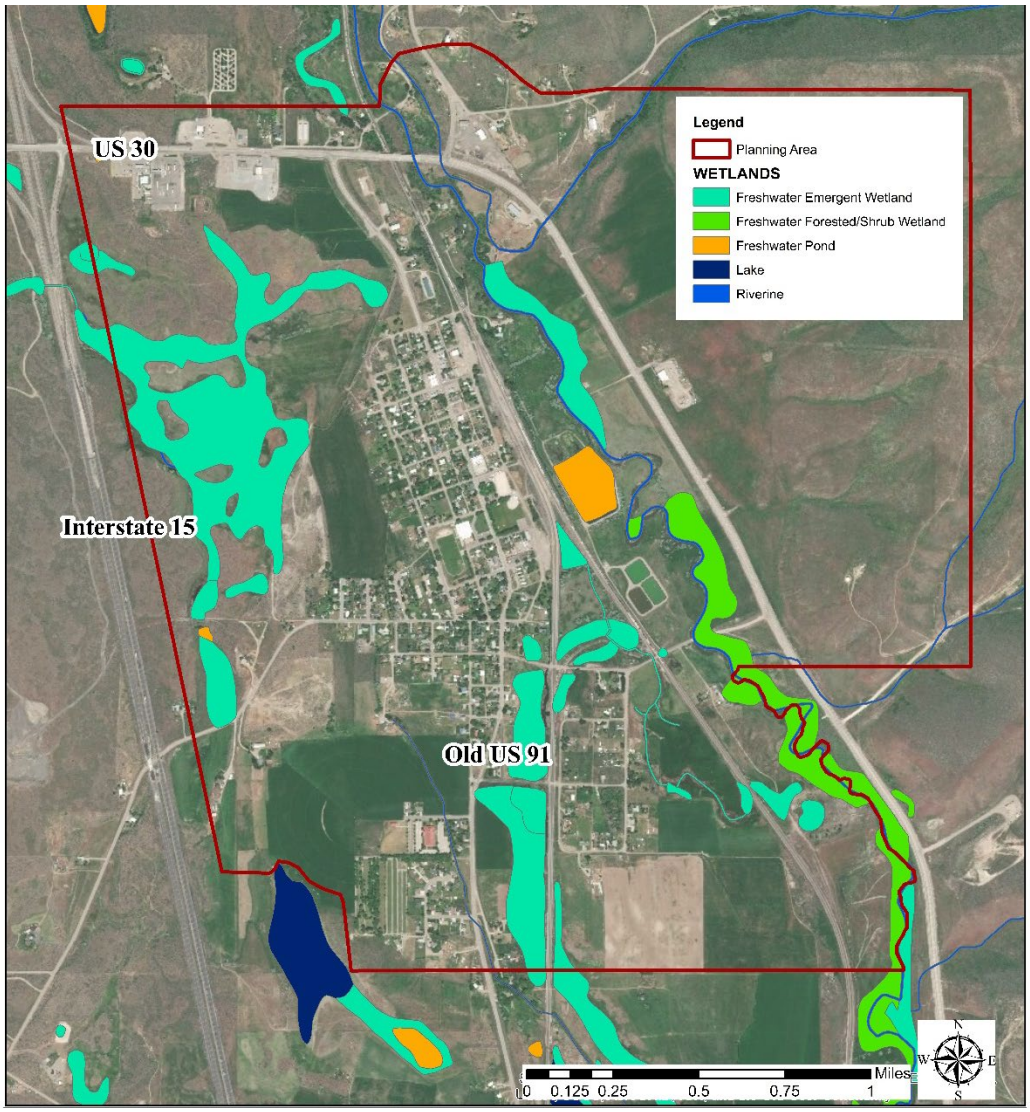


Figure 2-4 Wetlands

2.2.9 Wild & Scenic Rivers

There are no Wild and Scenic rivers located in the planning area.

2.2.10 Public Health & Water Quality

The City monitors the drinking water to ensure the public health standards are met. The water from the spring is disinfected with liquid sodium hypochlorite. During the summer when water use is at a high, the City enforces alternating water usage days for irrigation to ensure that the proper contact time is met in the tank.

Water quality sampling occurs routinely in the system as required by IDEQ and USEPA. Consumer Confidence Reports from 2018 and 2019 show contaminant levels in the system. The City of

McCammon had no drinking water contaminant violations in 2018 or 2019. These Consumer Confidence Reports can be found in Appendix C.

2.2.11 Important Farmlands

There is a vast amount of land in and around the McCammon area that is used for agriculture. According to the Bannock County Soil Survey, some of this agricultural land contains soils that are designated as “prime” farmland soils. Such designations are given to soils that are economically capable of producing sustained high yields of food, seed, forage, fiber, and oilseed crops. Not all “prime” farmland soils are used for agriculture, some have been lost to urban uses. Figure 2-5 shows agriculture lands in and around the McCammon area and agricultural land considered “prime”.

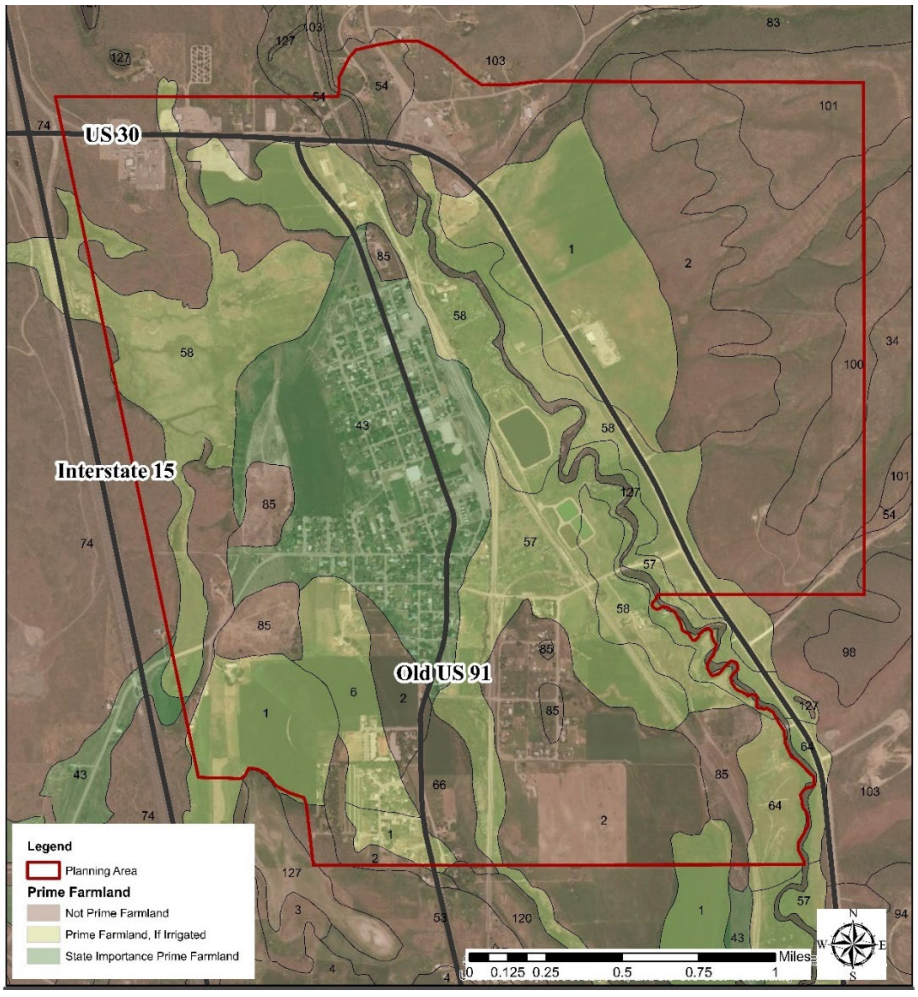


Figure 2-5 Prime Farmland

2.2.12 Sole Source Aquifer

McCammon lies approximately 28 miles southeast of the extents of the Eastern Snake River Plain Aquifer which has been designated as a Sole Source Aquifer. There are no Sole Source Aquifers within the planning area.

2.2.13 Land Use & Zoning

The City of McCammon consists of approximately 850 acres. About 485 acres are zoned for non-agricultural uses. Of the zoned developable acreage, about 42% is currently in residential use, about 4% is commercial, and another 5% is light industrial. With a few exceptions, the remaining acreage is primarily in agricultural use. Grass and alfalfa hay are typical crops.

2.2.14 Precipitation, Temperature, & Prevailing Winds

Climatological data retrieved from NOAA for McCammon are presented in Table 2-3. Snowfall averages less than 4 feet per year. The average freeze-free growing season is 113 to 146 days for 32°F and 28°F frosts, respectively. Approximately 35% of the annual 16.35 inches of precipitation falls during the growing season.

Table 2-3 McCammon Climate

Month	Mean Temp (˚F)	Precipitation (in)	Prevailing Wind		
			Mean Speed (mph)	Direction	Peak Gusts (mph)
Jan	21.4	1.64	10	WSW	68
Feb	25.5	1.4	11	WSW	60
Mar	35.6	1.48	11	WSW	64
Apr	44.2	1.26	12	WSW	66
May	52.6	1.93	11	WSW	61
Jun	60.7	1.23	10	WSW	70
Jul	68.3	0.82	9	WSW	66
Aug	67	1.17	9	WSW	68
Sep	57.5	0.97	9	WSW	51
Oct	45.6	1.18	10	WSW	51
Nov	33	1.38	11	WSW	58
Dec	22.7	2.15	10	WSW	58
Annual	44.5	16.61	10	WSW	70
					www.ncdc.noaa.gov

2.2.15 Air Quality & Noise

Idaho is among the states that have delegated authority from EPA to issue air quality permits and enforce air quality regulations. IDEQ's air protection efforts are intended to ensure compliance with federal and state health-based air quality regulations. The Clean Air Act of 1970 identified six common air pollutants of concern, called "criteria pollutants." These criteria pollutants are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. Fugitive dust is also closely regulated as it contributes to particulate matter.

IDEQ monitors air quality and publishes air quality information. McCammon is not in an area with sensitive air quality as shown by the map of Administrative Boundaries for Areas with Sensitive Air Quality in Figure 2-6 from IDEQ. No noise issues have been identified for the area.

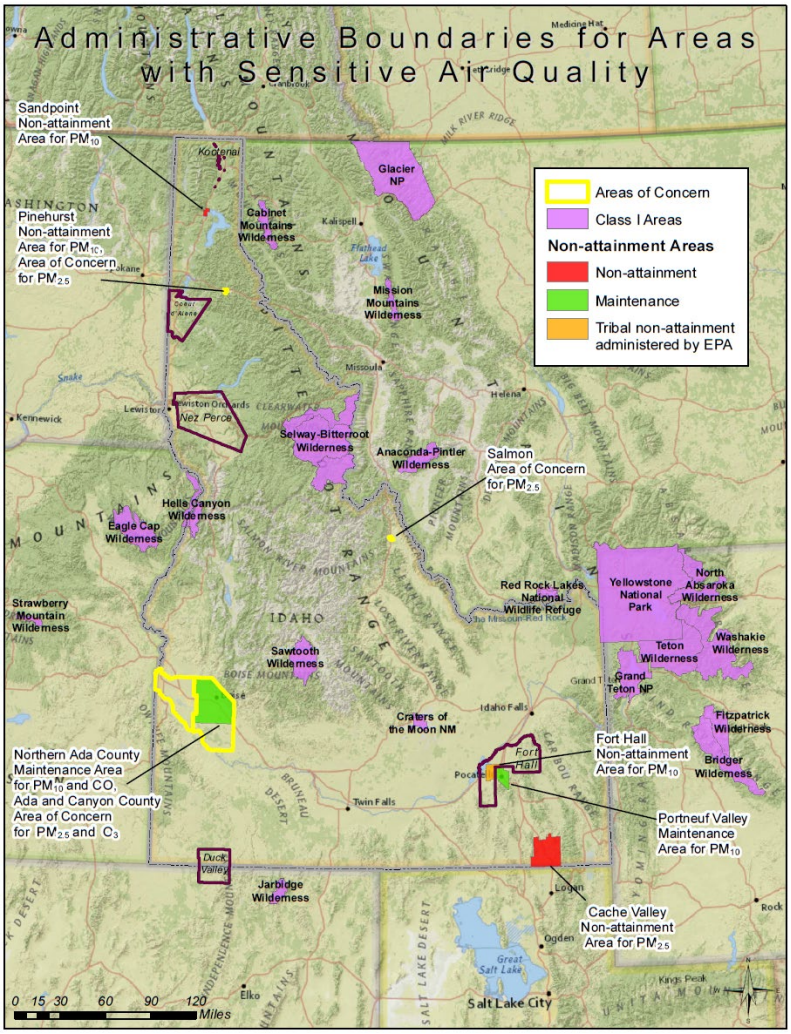


Figure 2-6 Air Quality Map

There are no anticipated long-term adverse impacts to the air quality and noise levels from any proposed improvements. Proposed improvements may have a temporary local impact on noise and air quality (dust) during construction. Best Management Practices during construction can mitigate airborne dust.

2.2.16 Energy Production & Consumption

The City of McCammon does not produce any energy. Energy use by the City's drinking water system is comprised primarily of pumping from groundwater wells and the dosing pumps for the sodium hypochlorite.

2.2.17 Socioeconomic Profile

The population of McCammon in the year 2010, based on census data, was 809. The current population of McCammon is estimated to be about 831 people according to the US Census Bureau's Vintage 2019 Population Estimates. Approximately 40% of McCammon's population is in the labor force. The top five areas of employment are office and administrative support (19%), sales (13%), executives and administrators (12%), food preparation (10%) and education/training (6%). Over 90% of McCammon's labor force is employed in Pocatello. No change is anticipated in this employment scenario. About 22% of McCammon's population is over 65, presumably retired. The median household income in McCammon (based on Idaho Dept. of Commerce statistics) is $54,999.

Population growth in McCammon has historically been gradual, with an average annual increase of about 1% over the past 40 years. Growth has consisted primarily of single-family residences with a small retail base. This trend is expected to continue with the development of platted subdivisions in the planning area.

Based on land use and topography, residential growth in McCammon is most likely to occur on the west and south sides of the City. Commercial growth is likely to occur along U.S. Highway 30N.

2.2.18 Transportation

McCammon is situated with Interstate 15 on the west, and U.S. Highway 30N on the north and east. Both of these roads are heavily traveled for both commercial and personal use. The Union Pacific Railroad has main route lines running between the river and the residential area of the City.

2.2.19 Maps, Site Plans, Schematics, Tables, & Letters from Consulted Agencies

General discussion and mapping of environmental conditions are presented in this chapter. Relevant state and federal agencies were contacted to provide comment on the environmental

effects of the preferred alternatives presented later in the study. A brief summary of the responses received is given in Chapter 8. Detailed information regarding the environmental impacts of preferred improvement alternatives is included in Chapter 7, and the related agency consultation efforts is included in Appendix F: Environmental Information Document.

Chapter 5 – DISTRIBUTION SYSTEM & HYDAULIC ANALYSIS

This chapter looks at both the hydraulic capacity of the existing lines and the overall condition of them. Keller Associates utilized a computerized hydraulic model of the system to determine the capacity, while the overall condition was determined based on age of the existing pipe and input from the city personnel.

5.1 MODEL DEVELOPMENT

Bentley's WaterCAD was used to create the hydraulic model for the McCammon distribution system. This model was used to represent the current water system as laid out in Figure 1-1. The water system pipe layout, pipe diameters, network connectivity, and material types was based on the 2006 WFPS with several updates determined through consultation with City staff familiar with the water system and recent drinking water projects. Due to problems during the hydrant flow tests, the water model for the existing system was not calibrated due to unreliable test results to compare against. Hydrants were inoperable or the operator was afraid to open them because he may not be able to get them closed again. In one instance, a section of glued PVC pipe in the townsite area came apart while flow testing a hydrant in that location.

Google Earth was used as the basis for elevations for the tank, hydrants, well, and junctions. The model was used as a tool to determine the areas in the system most susceptible to low flows and pressures. The water model was also used to determine which improvements would provide the best overall system benefits and to size future pipes to accommodate projected system flows.

5.2 MODEL CALIBRATION

Model calibration refers to the process of adjusting model parameters, so that model output matches the observed field conditions. Field tests were conducted on April 8, 2019 at various locations throughout the City to determine flows for calibrating the model. Only two of the fire hydrants tested yielded results. The other fire hydrants being tested had bad seals that were leaking or the valves were frozen could not be turned on. The results from one of the two hydrants did not produce usable data as the residual pressure went to zero. This left no reliable data to calibrate the model. The model assumes that pipes are not leaking but that aging has led to a lower Hazen-Williams coefficient.

5.3 HYDRAULIC ANALYSIS

5.3.1 Peak Hour Demand

As shown in Appendix D, modeling results under peak hour conditions show slight decreases in pressure compared to the average day conditions. Under the assumed peak hour demand condition, the current water system should be able to supply 60 psi to all areas of the system. It is possible that the peak hour flow was underestimated. A comparison with other cities in southeast Idaho shows that McCammon's estimated usage is lower than some nearby communities. However, it is unlikely that these differences would result in pressures less than the target peak hour minimum pressure of 40 psi.

5.3.2 Maximum Day Demand Plus Fire Flow Demand

The recommended fire flow rates are discussed in Section 4.5 of this report. As shown in Figure 5-1, modeling results under fire flow with maximum day conditions show that only the junction nearest to the tank meets fire flow requirements currently. No hydrants currently meet fire flow requirements due to undersized pipes. The hydrant with the highest available fire flow had a flow of approximately 700 gpm. The average available fire flow for all the hydrants in the City was approximately 362 gpm. This is significantly lower than the base fire flow demand of 1,250 gpm, and the required fire flow at the church of 3,000 gpm and 4,000 gpm at the elementary school.

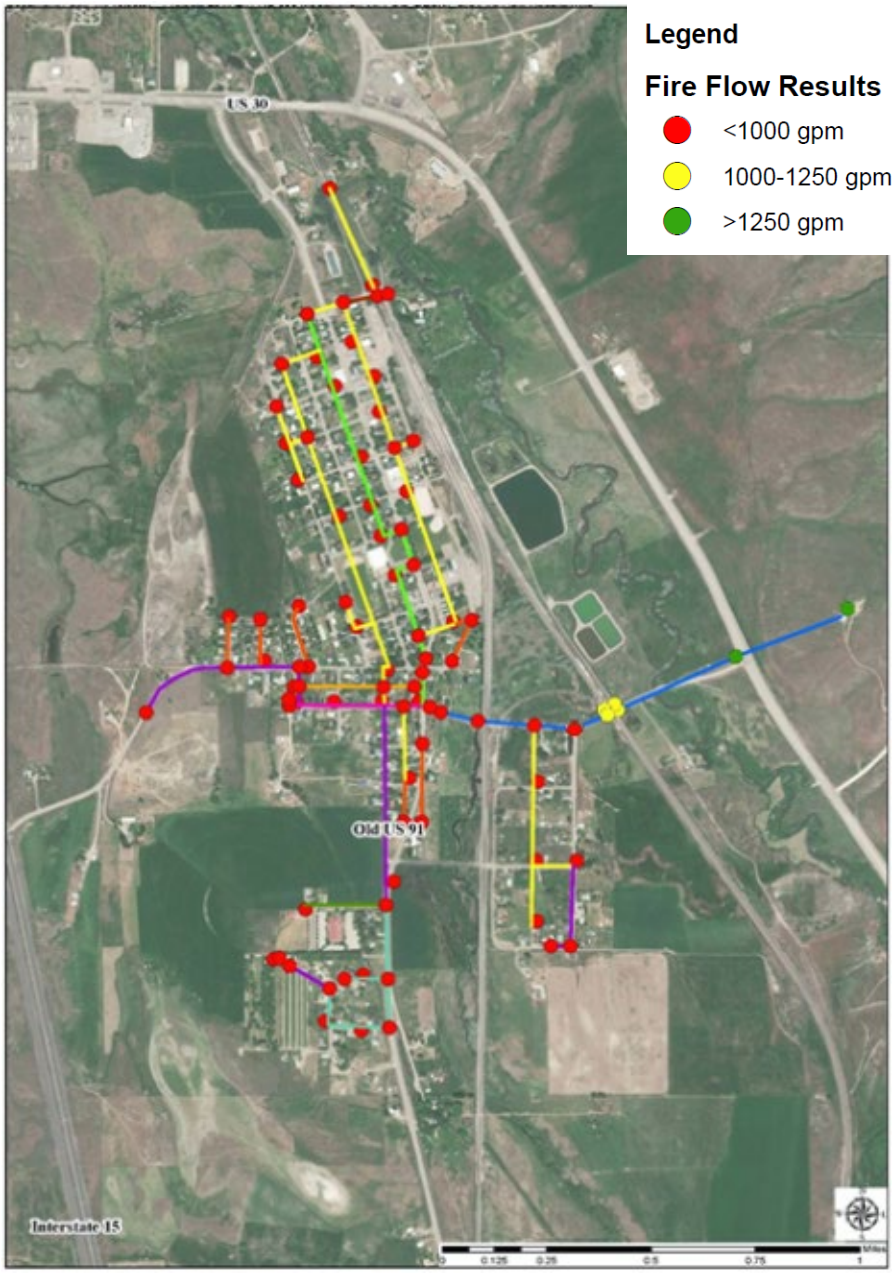


Figure 5-1 Maximum Day Plus Fire Flow Results

5.4 DISTRIBUTION SYSTEM PHYSICAL CONDITION

The older sections of pipe in the City are deteriorating causing more and more maintenance to keep them working. The City has replaced sections of pipe as budget allows and as necessary due to line failures. There is a need to replace the older existing lines due to deterioration and to upsize them to meet fire flow regulations.

5.5 HYDRANT COVERAGE

As discussed in Section 5.2, the non-working hydrants need to be replaced so that hydrant coverage can be achieved. Figure 1-8 presented previously illustrates hydrant coverage assuming the pipes are sized correctly and hydrants are functioning properly.

Chapter 6 – SUPPLY, STORAGE, & DELIVERY ANALYSIS

This chapter documents the analysis of McCammon's drinking water supply, storage, and delivery facilities. Capacities and general recommendations for addressing deficiencies are discussed here. More detailed improvement alternatives are evaluated in Chapter 7.

6.1 SUPPLY ANALYSIS

The current water availability includes 540 gpm from Crystal Springs and approximately 170 gpm from Well No. 1 and 130 gpm from Well No. 3. The City of McCammon can produce 840 gpm at maximum production but needs to produce 870 gpm to meet maximum day demands. Crystal Springs produces more than 540 gpm for much of the year, but the City's water right limits how much it can use.

System supply was evaluated for the entire system for compliance with the Idaho Drinking Water Rules, which state that a drinking water system must have adequate firm capacity to supply peak hour demand or at least a minimum of maximum day demand if adequate equalization storage is provided (IDAPA 58.01.08.501.17)[1]. Firm capacity of the overall system is 300 gpm. This supply analysis assumes that storage requirements are met or will be met. Storage requirements will be discussed later in this chapter. Table 6-1 compares firm capacity with projected system demands.

Table 6-1 Firm Capacity vs Projected Demands

Year	Forecasted Population	Max Day Demand (gpm)	Existing Firm Capacity (gpm)	Surplus/(Deficiency) (gpm)
2020	849	870	300	(570)
2030	947	970	300	(670)
2040	1057	1083	300	(783)

Recommendations

The City needs to increase firm capacity to meet the max day demands. They need to have backup water supply for emergency use and to keep up with demands as their population increases.

[1] Idaho Department of Environmental Quality. (2016). Idaho Rules for Public Drinking Water Systems. Retrieved June 8, 2017 from https://adminrules.idaho.gov/rules/2016/58/0108.pdf

6.2 STORAGE ANALYSIS

Water storage is typically needed when a water source either does not meet peak hour system demands or to provide necessary fire flow demands. Currently, the City of McCammon's water tank is adequate for meeting peak hour demands but is not adequate to meet fire flow demands. The existing water storage tank has a storage capacity of 300,000 gallons. The tank is old but in good condition.

System storage is governed by equalization storage requirements and fire flow for the Mountain View Elementary School during max day demand conditions. Equalization storage is calculated as the difference between Maximum Day Demand minus firm capacity over 24 hours. The school requires a fire flow of 4,000 gpm over a period of 4 hours because it does not have fire sprinklers. Table 6-2 shows a comparison of fire flow with maximum day demands, supply, and storage. The supply and storage amounts were subtracted from the total demand to show the additional storage required to serve the system.

Table 6-2 Storage Requirements

Storage Component	2020 (MG)	2040 (MG)
Equalization[1]	0.82	1.13
Fire Suppression[2]	0.96	0.96
Standby[3]	0	0
Subtotal	1.78	2.09
Operational, 10%	0.18	0.21
Dead, 5%	0.09	0.10
Total - Required Storage	2.05	2.40
Available	0.30	0.30
Additional Storage Needed	**1.75**	**2.10**

[1]MDD minus Firm Capacity for 24 hrs

[2]Elem. school; 4000 gpm for 4 hours

[3]Spring requires no backup power, fire flow accounted for separately

Recommendations

The best alternative to meet the storage deficit would be to construct a new storage tank. Efforts to reduce usage or fire flows would not lower the required storage volume enough for the existing tank to be adequate. The required fire flow storage could be reduced by installing fire

sprinklers in the school and church. Installing fire sprinklers in these buildings and requiring fire sprinklers in any new building with a needed fire flow above 1,500 gpm would greatly reduce the fire suppression storage requirement.

6.3 DELIVERY ANALYSIS

The City of McCammon's water distribution/transmission system has served the City for several decades with few upgrades. Many of the lines have approached the end of their useful life and are in need of replacement. Many of the remaining lines are in good condition but are too small to provide adequate flow and pressures to all areas of the City during a fire.

Recommendations

Due to age and size restraints, it is recommended that the City undergo significant upgrades to their water distribution/transmission system. By doing so, the following benefits will be realized.

- There will be adequate flow capacity to provide fire flow to the City.
- The risk of lines breaking will be reduced as brittle and corroded pipes are replaced.
- Unidentified leaks will be fixed.
- Water quality will improve as lead jointed piping is replaced.
- The piping system will meet regulatory requirements.

6.4 SUMMARY OF RECOMMENDATIONS

The system is not meeting requirements for firm capacity, storage, or hydraulic flows. By increasing the City's firm capacity, the storage deficiencies will improve as well. Currently, the City is 783 gpm short of meeting firm capacity for the projected 20-year Maximum Day Demand. Increasing the firm capacity will decrease the amount of storage that the City would need to construct. Assuming firm capacity remains unchanged, the City would need to construct a 2.1 million gallon storage tank to meet storage requirements. These changes will correct water capacity needs but the City still faces getting the water where it is needed. The older, under-sized lines need to be replaced to allow proper flow to houses as well as meet the fire flow demands in case of emergency. Chapter 7 will discuss, in detail, improvement alternatives to address the City's needs.

Chapter 7 – IMPROVEMENT ALTERNATIVES

This chapter outlines the development and screening of specific supply, storage, delivery, and transmission improvement alternatives to address the deficiencies identified in Chapters 5 and 6. In addition to construction of new facilities, this chapter evaluates whether optimization of existing infrastructure is an option and what the consequences of taking no action might be.

7.1 REGIONALIZATION

The City of McCammon is not located adjacent to another public drinking water system. The nearest public water system is in the City of Arimo approximately 5 miles south of McCammon. The large distance between surrounding systems and a difference in elevation means it would be difficult to implement regionalization due to cost and pressure considerations. It is not likely regionalization would improve system performance. This alternative will not be considered further.

7.2 SUPPLY ALTERNATIVES

These alternatives address the deficit between firm capacity and maximum day demand.

7.2.1 No Action

The City's supply firm capacity is currently at a deficit compared to maximum day demand. Without additional sources of supply or a reduction in demand, the system is out of compliance with state regulations. No action by the City would prevent further growth. If the spring were to become contaminated or if the spring supply line were to break, the City would not be able to produce sufficient water for its citizens.

7.2.2 Optimization of Existing Facilities

There are multiple options for the City of McCammon to optimize their existing infrastructure.

Water Rights: The capacity of the water supply is determined by the characteristics of available water sources and their accompanying water rights. Under the beneficial use requirement for water rights, part or all of a water right may be lost if it is not used for a continuous five-year period. The City could increase supply by filing for additional water rights on Crystal Springs or by purchasing additional water rights.

The spring's total capacity is unknown, and its flow is variable. The City's current water rights to Crystal Springs limit usage to 540 gpm. Though additional water rights on the spring could be applied for, obtaining more water is uncertain due to the existence of prior rights (1,570 gpm) for irrigation by other users.

Supply Line: The supply line from the spring to the tank is aging and may benefit from replacement. It is unknown if the line is leaking or how bad it may be leaking. If the City were to obtain additional water rights to Crystal Springs, it is likely that this supply line would need to be upsized to deliver the water to the tank. For the time being, the City can continue to repair this line as needed to prolong the time before a full replacement occurs.

Well No. 1: When in use, Well No. 1 supplies about 170 to McCammon's water system. The City could retrofit Well No. 1 to install a screen and filter pack to filter out the sand. With sand filtering installed, it is estimated that Well No. 1 could supply 200 – 500 gpm. The City currently has ground water rights for a diversion of up to 700 gpm.

Well No. 3: When in use, Well No. 3 furnishes about 130 gpm to McCammon's water supply. The City is currently planning to replace the pump and motor to increase supply to approximately 175 gpm.

Water Meters: The installation of water meters and implementation of metered water rates could decrease the City's water demand. The reduction in demand could reduce the needed firm capacity meaning additional water rights and sources likely would not be needed until the City sees more growth.

7.2.3 New Sources

New Wells: The City of McCammon could obtain additional water sources by drilling additional wells. Recent wells drilled by the City have not produced over 100 gpm. It is likely that the City may only get 100 gpm of production out of any new well they construct. If production from Well 3 is increased to 175 gpm as planned, the City has water rights for diversion of an additional 355 gpm of ground water. It would be necessary to add a point of diversion to the existing water rights for any new well that is added. The City's two currently operating wells are in the southern or central part of the City. The northern part of the City would be the best candidate for a new well to be installed in the City. Well 4 at the northwest corner of Center Street and 1st Street has never been developed because it produces so little water. This well might be perforated and pump tested to see if it could be developed for an operating well.

7.2.4 Initial Screening of Supply Alternatives

An initial evaluation of the previously described alternatives was made to eliminate alternatives that were not feasible or had other concerns. This evaluation is summarized in Table 7-1.

Table 7-1 Initial Screening of Supply Alternatives

Alternative	Viable?	Comments
No Action	No	Firm capacity is at a deficit compared to max. day demand.
Optimization	Partially	**Well No. 1** and **Well No. 3 improvements, and implementation of a metered water rate** are all viable alternatives. The City has been installing meter pits when replacing distribution lines and can continue to do so until the decision to implement metering is made.
New Sources	Yes	A new well would provide sufficient firm capacity to make up some of the deficit between firm capacity and max. day demand. The two operating wells are in the southern and central portions of the City, so a new well in the northern portion of the City would be ideal. A new well (**Well No. 4**) on the northwest corner of 1st Street and Center Street is the preferred alternative.

7.3 STORAGE ALTERNATIVES

7.3.1 No Action

On a day to day basis, "no action" would not be felt until growth in the community necessitated more storage. The real concern of "no action" is the possibility of a fire. The City does not have enough water in storage to put out a fire at the elementary school or the church.

7.3.2 Optimization of Existing Facility

The existing storage tank is utilized at full capacity.

7.3.3 New Storage Tank

The City could build a new water storage tank on the same site of the existing tank and connect both tanks into the system. This will ensure the City meets the storage capacity requirements. The size of a new tank would be determined by improvements made to system supply and the implementation of metering. If metering were not implemented and no supply improvements were made, the tank would need to be a minimum of 2.1 MG.

7.3.4 Initial Screening of Storage Alternatives

An initial evaluation of the previously described alternatives was made to eliminate alternatives that were not feasible or had other concerns. This evaluation is summarized in Table 7-2.

Table 7-2 Initial Screening of Storage Alternatives

Alternative	Viable?	Comments
No Action	No	The lack of fire suppression storage in the system is not considered acceptable.
Optimization	No	The existing storage tank is utilized at full capacity.
New Storage Tank	Yes	The current storage deficit is 2.1 MG. However, the implementation of metering and supply improvements will lower this deficit. It is recommended that the City install 1.05 MG of storage now and see the effects of these other changes before installing an additional storage tank.

7.4 DELIVERY & DISTRIBUTION ALTERNATIVES

7.4.1 No Action

The piping throughout the City will continue to break down and require more and more maintenance. The fire flow required to extinguish a fire would not be met.

7.4.2 Optimization of Existing Facilities

Water Meters: The installation of water meters and implementation of a metered rate, also discussed in Section 7.2.2, would decrease the City's water demand and improve pressures in the City. However, modeling shows that the current system is adequate for meeting peak hour demands. Because of the inadequate pipe sizes in the system currently, the reduction in demand by implementing metering would not be enough to reduce the number of lines needing to be replaced to meet fire flows. Furthermore, the system would still be susceptible to frequent breaks due to aging pipes.

7.4.3 New Delivery Infrastructure

The goal of new distribution infrastructure is to address low system pressures and leakage caused by undersized and aging pipes and the lack of looping in the system.

Replace Aging and Undersized Pipe: The City of McCammon may choose to replace their water distribution/transmission system at once or in several phases over the course of several years. This would help the system meet fire flow demands and improve pressure and flow to the residents. The line from the tank to the rest of the system should be prioritized as no hydrants can meet fire flow without this line being upsized. Most of the system is currently undersized. A list of recommended line replacement projects can be found in Section 8.

Addition of Looping Lines: Ensuring that the system is adequately looped (fed from more than one pipeline) is essential to maintaining available flow, pressure, and water quality. Dead ends

should be regularly flushed to avoid stagnation. The following locations are recommended for looping improvements:

- Logan St. Loop
- 15th St. Loop
- Townsite Loop

7.4.4 Initial Screening of Delivery Alternatives

An initial evaluation of the previously described alternatives was made to eliminate alternatives that were not feasible or had other concerns. This evaluation is summarized in Table 7-3.

Table 7-3 Initial Screening of Delivery Alternatives

Alternative	Viable?	Comments
No Action	No	Lines will continue to deteriorate, and fire flow demands will not be met.
Optimization	Yes	The City has been installing meter pits when replacing distribution lines and can continue to do so until the decision to implement metering is made.
New Delivery Infrastructure	Yes	**Replacing aging and undersized pipe** will help reduce system leakage and improve fire flow pressures. **Looping lines** will improve pressure, flow, and water quality.

7.5 FINAL SCREENING OF ALTERNATIVES

This section identifies which alternatives will be selected for inclusion in the Capital Improvement Plan.

7.5.1 Results of Initial Screenings

Table 7-4 provides a summary of the viable alternatives discussed in the respective initial screening in previous sections of this chapter.

Table 7-4 Summary of Initial Screening of Alternatives

Supply	Storage	Delivery/Distribution
Well No. 1	New Hill Tank	Water Meters
Well No. 3		Replace Aging/Undersized Lines
Water Meters		Addition of Looping Lines
Well No. 4		

The system needs improvements for supply, storage, and distribution. As storage capacity is the

most critical need, a New Hill Tank should be the first priority. Many of the existing distribution lines are undersized for fire flow, but the New Tank is necessary to fully realize the benefit of upsizing those lines. The current storage deficit is estimated to be 2.1 million gallons. Supply improvements and flow metering will help to decrease this deficit. The City decided to pursue 1.05 million gallons in storage now and address the remaining deficit in a future project if needed after reducing demands with other improvements.

Firm capacity can be increased by utilizing existing infrastructure. Installing a larger pump on Well #3 will increase production, and Well #4 might be developed to further increase supply. Well #1 improvements are recommended to be pursued at a later time.

Water meters are necessary to obtain USDA-RD funding. Water meters will likely decrease systems demands as has been seen in other cities that have implemented metering. Until the effects of implementing metering are clear, the City should hold off on seeking additional water rights. Additional water rights may be necessary in the future to accommodate growth.

7.5.2 Capital Costs

The City will see the greatest benefit with trying to address as many needs as possible at once to maximize agency funding. The City should build/install the new storage tank, Well #3 and Well #4 improvements, and water meters as priorities and then use the remaining budget to address distribution improvements. The first priority for distribution improvements should be the transmission line from the tank down to the rest of the system. The remaining distribution improvements should be prioritized to replace lines that include the most connections. Since all connections will need to be metered by the end of the project, this will provide some savings in installing the meters.

7.5.3 Reliability

The preferred alternatives improve system reliability in general by adding more supply, storage, and delivery capacity and improving system flows and pressures. The New Hill Tank will improve system reliability by adding storage to the system, and the Well #3 and Well #4 improvements will help by increasing supply to the system. All of the distribution line replacement projects will help improve system reliability by improving system flows and pressures, but the transmission line from the tank to the system should be prioritized as it will have the greatest impact of any distribution alternative.

7.5.4 Environmental Impacts

The general environmental impacts associated with the preferred alternatives are given in Table 7-5. Impacts documented include both impacts to the environment and special project considerations (beyond standard practice) resulting from the environment.

Table 7-5 Environmental Impacts of Viable Alternatives

Environmental Aspect	Well No. 3	Well No. 4	New Hill Tank	Distribution Improvements
Physiography, Topography, Geology, & Soils	No Impact	No Impact	No Impact	No Impact
Surface & Ground Water Hydrology	Local Drawdown	Local Drawdown	No Impact	No Impact
Fauna, Flora, & Natural Communities	No Impact	No Impact	No Impact	No Impact
Housing, Industrial, & Commercial Development	Accommodates area of higher growth	Accommodates future growth	Accommodates future growth	No Impact
Cultural Resources	No Impact	No Impact	No Impact	No Impact
Utility Use & Energy Consumption	Pumping electrical use	Pumping electrical use	No Impact	No Impact
Floodplains/Wetlands	No Impact	No Impact	No Impact	Improvements cross 100 Year & Wetlands
W&S Rivers	No Impact	No Impact	No Impact	No Impact
Public Health & Water Quality	Increased water supply	Increased water supply	Increased fire flow storage	Improved fire flow and better circulation
Prime Farmland	No Impact	No Impact	No Impact	No Impact
Sole Source Aquifer or Stream Flow Source Area	No Impact	Effects of well drilling	No Impact	No Impact
Land Use & Development	No Impact	No Impact	No Impact	Supports development
Climate	No Impact	No Impact	No Impact	No Impact
Air Quality & Noise	No Impact	No Impact	No Impact	No Impact
Socioeconomics	Improves supply for entire city	Improves supply for entire city	Improves supply for entire city	Improves supply for entire city

Most of the impacts noted are either beneficial or typical of these types of projects. The majority of these projects are replacing or improving existing infrastructure or are located near existing infrastructure in the case of the New Hill Tank. The transmission line from the tank to the City is adjacent to the existing roadway and crosses the flood plain and wetlands. The new transmission line will not impact the flood plain after it is constructed. Distribution improvement projects near wetlands are along existing roadways and should not have a significant impact on the wetlands.

7.6 IMPACTS TO SYSTEM CLASS & LICENSURE

McCammon's distribution system is classified as a Class I system. The threshold to becoming a Class II system is a population of 1,500 people. It is unlikely that the population will increase to above 1,500 people in the near future. The City's system does not have a treatment system classification because the type of disinfection used is on the list of exempt treatment processes. None of the preferred alternatives would have an effect on the treatment system classification.

7.7 PUBLIC PARTICIPATION

Over the course of this study, multiple presentations have been given in public meetings. The slides and meeting minutes for these meetings can be found in Appendix G. Study progress and findings were presented at the following City Council Meetings:

July 8, 2020 City Council Meeting

August 12, 2020 City Council Meeting

7.8 SELECTED ALTERNATIVES

The selected alternatives can be found in Table 7-6. These alternatives were shown to have little environmental impact, improve system reliability, and address current system needs. The Capital Improvement Plan for these alternatives is given in Chapter 8.

Table 7-6 Selected Alternatives

Supply & Storage	Distribution
New Hill Tank	Transmission
Tank Improvements	Water Meters
Well No. 3	Center - South
Well No. 4	State St. - North
	Logan St. Loop
	State St. - South
	16th St.
	Center - North
	Gear St.
	Front St.; 9th to 5th
	Front St.; 5th to 1st
	11th St.
	Townsite Loop
	N. RR Extension
	Bannock St.
	12th St.

Chapter 8 – CAPITAL IMPROVEMENT PLAN

This chapter presents the Capital Improvement Plan (CIP) developed for the City of McCammon water system. This CIP aids in the implementation of the selected alternatives by detailing cost estimates and priorities.

8.1 CAPITAL IMPROVEMENT PLAN

The capital improvement plan shown in Table 8-1 summarizes the recommended system improvements that are anticipated to require capital beyond routine maintenance practices. A detailed description of these improvements and a breakdown of the associated cost assumptions can be found in Appendix E: Capital Improvement Plan.

Table 8-1 Capital Improvement Plan

ID#	Name	Description	Cost
1.1	Transmission	Upsize transmission line from tank to the system	$1,159,000
1.2	Well #3 Pump	Replace pump and motor to increase production	$20,000
1.3	Tank #2	1.05 million gallon tank	$1,441,000
1.4	Well #4	New well on the north side of the city	$150,000
1.5	Tank #1	Improvements listed in the 2019 tank inspection	$158,000
2.1	Center - South	Replace undersized water lines and service lines to the property line. Replace non-working fire hydrants, add hydrants to improve coverage, install meter pits.	$369,000
2.2	State St. - North		$126,000
2.3	Logan St. Loop		$274,000
2.4	State St. - South		$294,000
2.5	16th St.		$173,000
2.6	Center - North		$445,000
2.7	Gear St.		$353,000
2.8	Front St.; 9th to 5th		$502,000
2.9	Front St.; 5th to 1st		$333,000
2.10	11th St.		$490,000
2.11	Townsite Loop		$606,000
2.12	N. RR Extension		$229,000
2.13	Bannock St.		$353,000
2.14	12th St.		$173,000
2.15	Meters	Install remaining water meters	$130,000
3.1	Tank #3	1.05 million gallon tank	$1,404,000
		Total Improvements (without Tank #3)	***$7,778,000***

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

Figure 8-1 is a map showing the location of all of these improvements within the City.

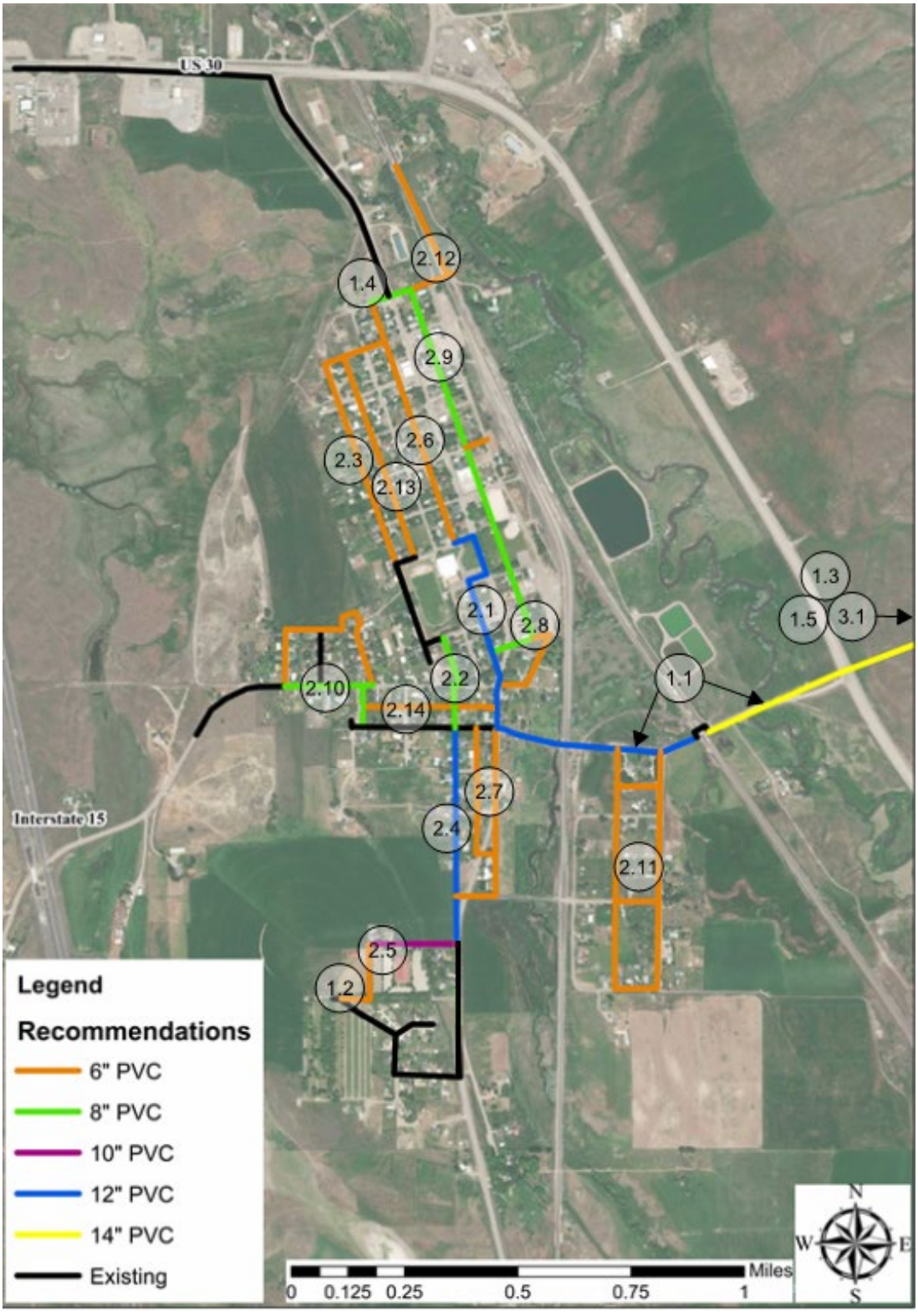


Figure 8-1 CIP Project Map

The CIP was organized into three priority categories. The first category includes necessary storage, supply, and delivery improvements to help meet fire and operational storage needs, increase firm capacity, and provide proper transmission from the storage tank to the system to meet fire flows. The second category includes the distribution improvements to replace aging and undersized lines and provide additional looping. The third category includes an eventual third storage tank to allow for future growth within the City.

8.2 SYSTEM MAINTAINANCE & OPERATION

The City will need to plan for ongoing maintenance and replacement costs associated with infrastructure throughout the system. Planning for annual system replacement costs is vital to keeping the system function over the next several decades. A detailed review of the City's operation and maintenance program was beyond the scope of this study. The user rate analysis in Chapter 9 includes an estimate of Operation and Maintenance costs for the City.

In addition to the replacement of aging equipment, the City's maintenance plan should include adequate performance of operational maintenance, including items such as exercising of hydrants, valves, and pumps, inspection of facilities, flushing, mapping, meter calibration, and data analysis. Accurate and complete system records are essential maintenance tasks as well. This effort behind this study was significantly aided by the available data and the insights of knowledgeable staff. The better the system's records regarding historical pumping, pump performance, system events, metering, etc. are maintained, the more enabled the City and its consultants will be to make informed decisions.

The improvements included in the CIP will result in an increase in power costs to operate a new pump for Well #4 and a larger pump for Well #3. New facilities and their components will need to be included in the City's maintenance and inspection plans. The City will see gradual increases in power and other operation costs as its service population grows. City administrators should also consider that as the system becomes larger and more complex, the need for adequate numbers of sufficiently trained staff also grows.

8.3 LAND AVAILABILITY

Land will likely need to be purchased for one of the capital improvement projects identified: Tank #2. The City has some space available on the Tank #1 property, but additional space will be required for the footprint of the additional storage tank. The City will also need to obtain an easement for the 16th St. distribution project where the looping line crosses the church field, and the 11th St. distribution project where the looping lines connect between Oriole St., Lark St., and Flamingo St. The remaining projects are located within the right of way or on existing City property.

Chapter 9 – FUNDING & IMPLEMENTATION

This chapter examines funding options for financing the Capital Improvement Plan (CIP). It also provides a review of potential impacts to user rates resulting from financing of the plan. Finally, a project schedule and implementation guide is presented.

9.1 FUNDING ANALYSIS

Funding for implementing the system improvements could come from several sources:

City Funds: The City may pay for projects out of reserve funds or allotted capital outlay budget if such funds are available. This would constitute a "pay as you go" philosophy. With this payment method, debt and interest payments are avoided. Additionally, a permanent funding mechanism is put in place such that a portion of the rate is set aside for funding capital projects rather than needing to get approval to borrow funds each time a new project is proposed. This method can be challenging as most cities do not have a large reserve in place once they are ready to begin a project. Rates must be increased routinely so that reserves build fast enough to complete projects and keep up with increasing construction costs. The City of McCammon does not currently have the funds in place for all the selected alternatives. Additional funding sources will be needed to pay for these improvements.

Local Improvement District: One method of funding projects whose benefits are specific to certain homes or streets is to create a Local Improvement District (LID). In this funding method, an assessment for the project is made against each home benefitted. Homeowners may then either pay the amount up front or make annual payments to the City. The amount is treated as a lien against the individual home that would need to be paid off when selling the property. An LID gives the City Council legal authority to borrow money to fund the project with or without the support of the residents affected by the LID. For this reason, LIDS's can sometimes be controversial. Since the selected alternatives benefit the entire City, an LID may not be the best funding option unless individual distribution line replacement projects have LID's for the homes benefitted by them.

Idaho Department of Environmental Quality State Revolving Fund: One common source of funding for municipal capital improvement projects is from low interest loans through IDEQ's State Revolving Fund (SRF) loan program. This program provides cities with low-interest loans to finance eligible water and sewer projects. Typical terms are 20-30 years at 1.5%-3% interest. Use of these funds typically requires implementation of American Iron and Steel requirements and Davis Bacon wage requirements. These requirements often result in an increased total project cost. In some cases, an amount of grant money in the form of "principle forgiveness" is awarded with SRF loans.

The selection process for being awards one of these loans is competitive. To be eligible for and receive funding from the SRF program, a letter of interest (LOI) must be submitted for the fiscal year, and the City must have an approved facilities planning study in place. IDEQ ranks all the submitted applications and awards funds accordingly. The City of McCammon should submit an LOI for the fiscal years when improvement projects are planned to have this funding option available.

United States Department of Agriculture-Rural Development (USDA-RD): USDA-RD offers a grant and loan program for improvements to wastewater systems that serve rural communities which is defined as systems that serve less than 10,000 people. Grants up to 45% of the project cost are eligible depending on user rates and income level of residents in the community. Applicants can apply for USDA-RD funds anytime during the year. Funds have many program requirements including the completion of a short-lived asset inventory, approved engineering report, and others. Voter approval in bond election or through judicial confirmation and interim financing are required with this funding source.

Idaho Department of Commerce Community Development Block Grant: The Idaho Department of Commerce offers a number of grant programs for public water system improvements. Eligibility for these funds is competitive and dependent on need. Grants up to $500,000 are available through community programs. Applicants must secure the services of a certified grant administrator to administer grant money and comply with other grant requirements. There is an annual application window for applying for these funds, typically in November.

United States Army Corps of Engineers (Section 595): The USACE sometimes offers money for water-related infrastructure to supplement funding from DEQ or USDA-RD. Funding availability depends on an appropriation from Congress and varies from year to year. Costs are shared with a 25 percent local match required.

Other Federal Programs: Special Congressional Appropriations vary in amount, depend on political climate, and are difficult to predict. Homeland Security Grants are a new source of funds for high-threat areas. It is not recommended that either of these are pursued as reliable sources of funding for the City's water infrastructure needs.

Incurring Debt: To incur indebtedness in any of the scenarios above, the City must either pass a bond election, implement a Local Improvement District, or go through the Ordinary and Necessary Judicial Confirmation process. Bond elections can only be held twice per year, once in May and once in November. The Judicial Confirmation process requires a hearing with a judge who will review the needs, proposed solutions, and impacts to the City and make a ruling on whether or not the project is ordinary and necessary. A Local Improvement District can be

implemented at any time through a process specified by state law which includes a series of legal notices and public hearings.

9.2 RATE ANALYSIS

9.2.1 Operational Costs

The Southeast Idaho Council of Governments (CICOG) performed an operational cost analysis for the City of McCammon's drinking water system. They estimated that the City needs about $7,719 per month for operation and maintenance expenses or about $25 per month per connection.

9.2.2 Rate Impacts of Borrowing

A rate impact analysis was run for the CIP items excluding tank #3. Both funding scenarios assume 311 connections in the water system. Two different scenarios were considered. These scenarios are:

- **USDA-RD Scenario:** This scenario assumes a 25% USDA-RD grant, a $500,000 Department of Commerce block grant, a $1,500,000 WaterSmart grant, and a $500,000 USACE grant. The remaining project total would come from a USDA loan with an assumed interest rate of 1.5% and term of 40 years.
- **DEQ SRF Scenario:** This scenario assumes a 10% DEQ SRF loan forgiveness (this varies by community but is typical) and a $500,000 Department of Commerce block grant. The remaining project total would come from a DEQ SRF loan with an assumed interest rate of 1.75% (this also varies by community but was typical of projects award in 2019) and a term of 30 years.

Table 9-1 summarizes the user rate calculations for these two scenarios. The USDA-RD scenario could potentially result in a significantly lower user rate and loan amount due to the additional grants and longer loan term.

Table 9-1 User Rates

	USDA-RD Scenario	DEQ SRF Scenario
2020 Project Costs	$7,778,000	$7,778,000
USDA-RD/DEQ Grant Amount	$1,944,500	$777,800
Block Grant	$500,000	$500,000
WaterSmart Grant	$1,500,000	-
USACE Grant	$500,000	-
Loan Amount	$3,333,500	$6,500,200
New Annual Debt Service	$111,429	$280,352
Existing Annual Debt Service	$21,106	$21,106
Total Monthly Debt Service	$11,045	$25,121
Monthly O&M	$7,719	$7,719
Monthly User Rate	**$64.76**	**$113.67**

9.3 PROJECT SCHEDULE

Based on discussions with the City, the projects in Table 8.1 have been listed in order of priority. Potential project completion time frames for the projects in the CIP are given in this section based on the City's preferred funding method. The timeframe for completion of the entire CIP could depend upon the final rate structure selected.

Completion of the transmission line upsize is crucial as this will provide the flows to the rest of the distribution improvements necessary to meet fire flow demands. The Well #3, Well #4, Tank #1, and Tank #2 projects are the next highest priority as these will increase firm capacity and storage which are needed to meet fire flow demands. The schedule shown lists major milestones for completion of this WFPS and the highest priority projects listed in the CIP.

- November 2020 WFPS Public Comment Period and Public Hearing
- November 2020 Official Acceptance of WFPS and Proposed Alternatives/CIP
- December 2020 IDEQ Environmental Review
- December 2020 Apply for Funding
- May 2021 Bond Election
- Summer 2021 Procurement of Engineering Design Services for High Priority Projects
- Summer 2021 Transmission Pipe Design
- Summer 2021 Well #3 and Well #4 Design
- Fall 2021 Transmission Pipe Construction
- Fall 2021 Well #3 and Well #4 Construction/Improvements
- Fall 2021 Tank #1 Design
- Fall 2021 Tank #2 Design

- Spring 2022 Priority 1 Improvements

The distribution improvements will follow after these high priority projects. Potential dates for completion of these projects listed in the CIP are shown.

- Summer 2022 Design Priority 2 Improvements
- Summer 2023 Construct Priority 2 Improvements

The final improvement from the CIP is Tank #3. It is recommended that the City wait to see the effect of implementing metering before pursuing an additional storage tank. The reduction in water usage from implementing metering may allow for the City to wait until additional population growth occurs before constructing Tank #3.

9.4 OTHER IMPLEMENTATION CONSIDERATIONS

9.4.1 Agency Consultation

9.4.2 Public Comment

CONCLUSION

The City of McCammon's water system is in need of improvements outlined in the Capital Improvement Plan to address deficiencies in fire flow, storage, aging lines, firm capacity, and stagnant dead ends. Most of these improvements are needed to address current needs but will also allow for future growth within the City as set forth in the 2040 planning period.

The recommendations in this study regarding distribution sizing and capacity needs should be used as a guide in evaluating future development. We recommend that the City consider updating this planning study every five years in order to keep its findings and recommendations current and valid. Future growth patterns in particular may differ from assumptions made in this study and may require adaptation.

The planning tools created in connection with this study, such as the water model and updates to the City's GIS mapping, should continue to be updated every 1-3 years to reflect repairs, replacements, and other changes to the water system that will inevitably take place. Maintaining the plan and the planning tools will help the City proactively manage their water system as a crucial component of the City's infrastructure.

Keller Associates would like to thank all those at the City of McCammon who participated in the development of this study, in particular the Mayor, City Council, and Public Works Department. The input and contributions of City officials and staff have been invaluable in making this facilities plan more relevant and useful to those responsible for providing drinking water services to the people of McCammon.

Appendices

Appendix A: Water System Facilities Records

- Bitton Well (Well #3) Report, Well Log, and Testing Results
- 2019 Tank Inspection Report
- Cross Connection Ordinance
- 2015 Sanitary Survey
- Hydrant Survey

Summary of City of McCammon Bitton Acres Water Well Upgrade

Bannock County
McCammon, Idaho
Prepared by

Clearwater Geosciences, LLP
August 2013

[illegible]

REGISTERED PROFESSIONAL GEOLOGIST
NO. 643
STATE OF IDAHO

Overview

Drilling

Aquifer Testing

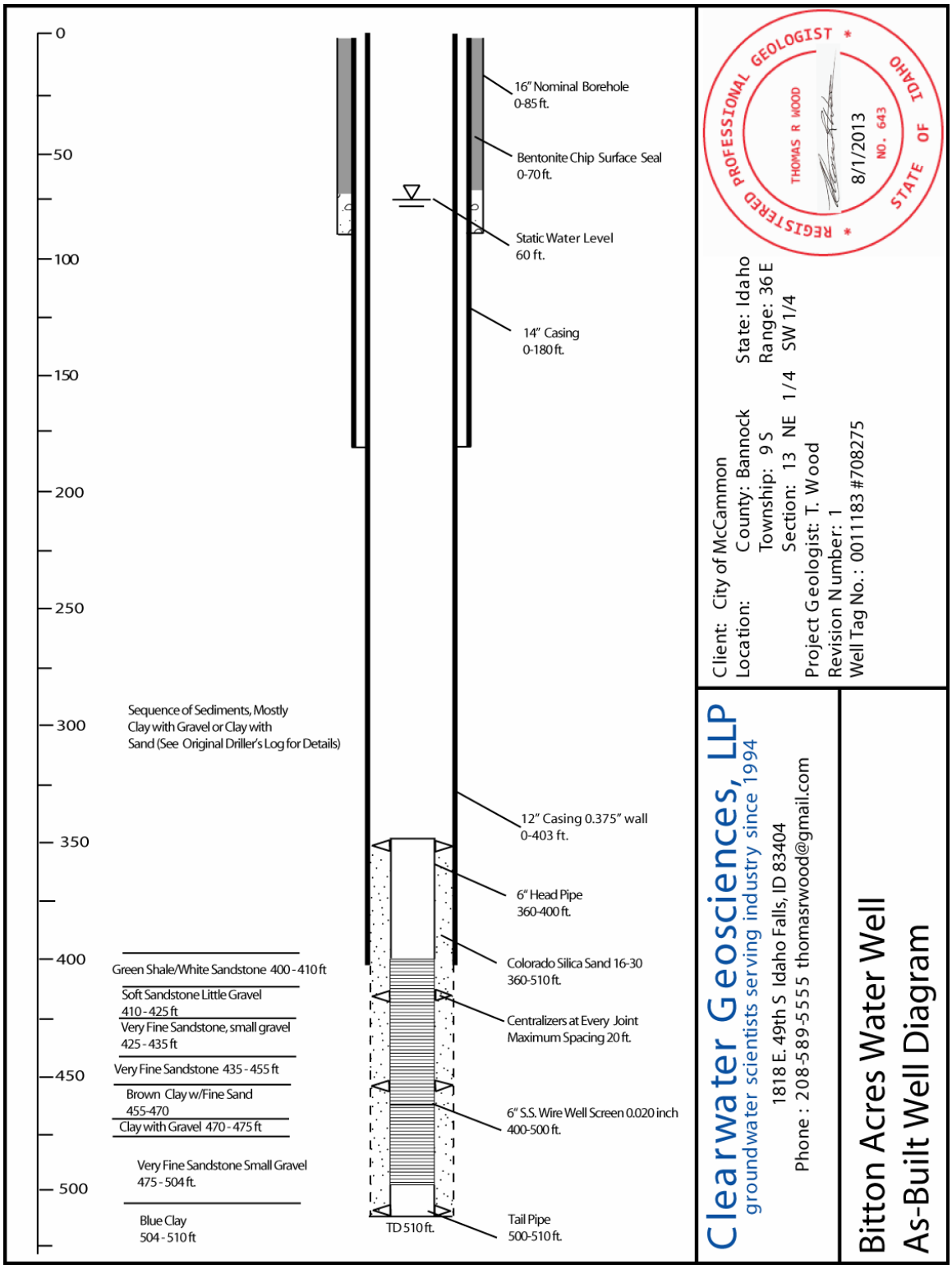
Sand Content Testing

Water Quality Testing

Attachment 1

As Built Drawing

Well Drillers Log


0
50
100
150
200
250
300
350
400
450
500
16" Nominal Borehole
0-85 ft.
Bentonite Chip Surface Seal
0-70 ft.
Static Water Level
60 ft.
14" Casing
0-180 ft.
12" Casing 0.375" wall
0-403 ft.
6" Head Pipe
360-400 ft.
Colorado Silica Sand 16-30
360-510 ft.
Centralizers at Every Joint
Maximum Spacing 20 ft.
6" S.S. Wire Well Screen 0.020 inch
400-500 ft.
Tail Pipe
500-510 ft.
TD 510 ft.
Sequence of Sediments, Mostly
Clay with Gravel or Clay with
Sand (See Original Driller's Log for Details)
Green Shale/White Sandstone 400 - 410 ft
Soft Sandstone Little Gravel
410 - 425 ft
Very Fine Sandstone, small gravel
425 - 435 ft
Very Fine Sandstone 435 - 455 ft
Brown Clay w/Fine Sand
455-470
Clay with Gravel 470 - 475 ft
Very Fine Sandstone Small Gravel
475 - 504 ft.
Blue Clay
504 - 510 ft
REGISTERED PROFESSIONAL GEOLOGIST
THOMAS R WOOD
NO. 643
STATE OF IDAHO
8/1/2013
Client: City of McCammon
Location: County: Bannock State: Idaho
Township: 9 S Range: 36 E
Section: 13 NE 1/4 SW 1/4
Project Geologist: T. Wood
Revision Number: 1
Well Tag No.: 0011183 #708275
Clearwater Geosciences, LLP
groundwater scientists serving industry since 1994
1818 E. 49th S Idaho Falls, ID 83404
Phone : 208-589-5555 thomasrwood@gmail.com
Bitton Acres Water Well
As-Built Well Diagram

Form 238-7
6/07

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

1. WELL TAG NO. D 0063107
Drilling Permit No. 29-99-E-0060-200
Water right or injection well #

2. OWNER: City Of McCammon
Name
Address P.O. Box 9
City McCammon State Id Zip 83250-0009

3.WELL LOCATION:
Twp. 9 North ☐ or South ☒ Rge. 36 East ☒ or West ☐
Sec. 13 ____ (10 acres) 1/4 NE (40 acres) 1/4 SW (160 acres) 1/4
Gov't Lot ____ County Bannock
Lat. ____ ° ____ (Deg. and Decimal minutes)
Long. ____ ° ____ (Deg. and Decimal minutes)
Address of Well Site Cemetary Rd. - Bitton Acres
(Give at least name of road + Distance to Road or Landmark) City McCammon
Lot. ____ Blk. ____ Sub. Name

4. USE:
☐ Domestic ☒ Municipal ☐ Monitor ☐ Irrigation ☐ Thermal ☐ Injection
☐ Other

5. TYPE OF WORK:
☐ New well ☐ Replacement well ☐ Modify existing well
☐ Abandonment ☒ Other Deepening

6. DRILL METHOD:
☐ Air Rotary ☐ Mud Rotary ☒ Cable ☐ Other

7. SEALING PROCEDURES:

Seal material	From (ft)	To (ft)	Quantity (lbs or ft³)	Placement method/procedure

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/ Schedule	Material	Casing	Liner	Threaded	Welded
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Was drive shoe used? ☐ Y ☐ N Shoe Depth(s)

9. PERFORATIONS/SCREENS:
Perforations ☐ Y ☒ N Method
Manufactured screen ☒ Y ☐ N Type Johnson Stainless Steel
Method of installation Set in Open Hole

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
500'	400'	.020	100'	6"	Stainless	

Length of Headpipe 50' Length of Tailpipe 10'
Packer ☐ Y ☒ N Type

10.FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft³)	Placement method
Silica Sand	510'	360'	1250 lbs	Tremmie Pipe

11. FLOWING ARTESIAN:
Flowing Artesian? ☐ Y ☒ N Artesian Pressure (PSIG)
Describe control device

12. STATIC WATER LEVEL and WELL TESTS:
Depth first water encountered (ft) ____ Static water level (ft) 63'
Water temp. (°F) ____ Bottom hole temp. (°F) ____
Describe access port Well Cap

Well test:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)
200'	210	24

Test method:

Pump	Bailer	Air	Flowing artesian
☒	☐	☐	☐
☐	☐	☐	☐

Water quality test or comments:

13. LITHOLOGIC LOG and/or repairs or abandonment:

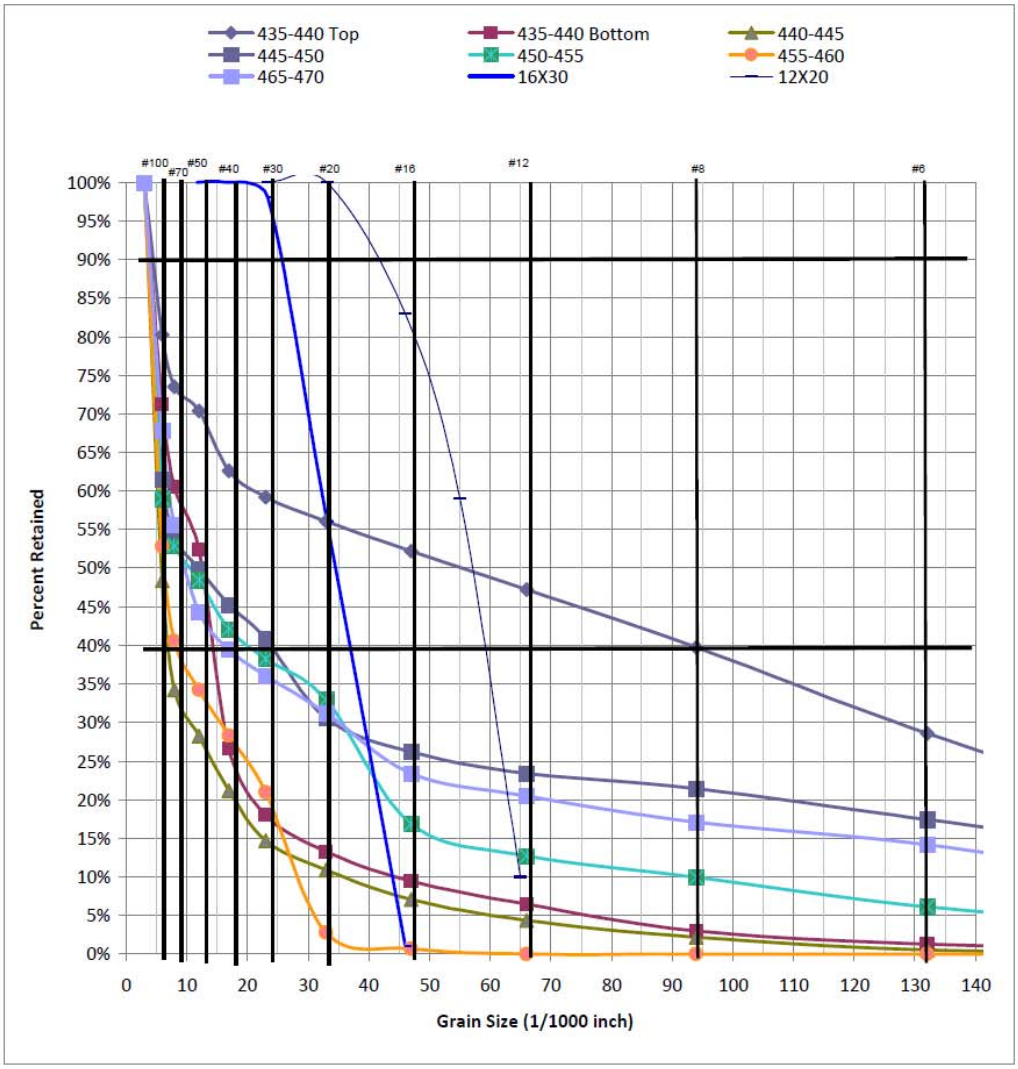
Bore Dia. (in)	From (ft)	To (ft)	Remarks, lithology or description of repairs or abandonment, water temp.	Water Y	Water N
12"	425	435	V. Fine Sandstone, small gravel	X	
	435	455	V. Fine Sandstone	X	
	455	455	V. Fine Sandstone & clay	X	
	455	470	Brown Clay w/v. Fine Sand		X
	470	475	Clay with Gravel		X
	475	504	V. Fine Sandstone Small Gravel	X	
	504	510	Blue Clay		X

Completed Depth (Measurable):
Date Started: 5/15/2013 Date Completed: 7/22/2013

14. DRILLER'S CERTIFICATION:
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Jack Cushman Drilling, Inc. Co. No. 94
*Principal Driller [signature] Date 7/23/2013
*Driller [signature] Date 7/23/2013
*Operator II Date
Operator I Date

*** Signature of Principal Driller and rig operator are required.**



Job Name City of McCammon- Bitton Acres \
Location McCammon, ID
Driller Cushman Drilling Co.

Sample ID 060613-1
Analyzed by: Al Smith, 651-638-3160
Date: 6/6/2013

Casing ϕ 12"
Screen ϕ 6" Pipe Size

Yield 100 - 200 GPM Desired
SWL (ft) 75'

Recommended Slot Size 20 Slot From 435' - 495'
Recommended Gravel Pack 16 X 30 Silica Sand

Based exclusively on the samples provided by the contractor, a sieve analysis graph and suggested screen slot size is provided as requested. Since numerous construction considerations and site circumstances influence successful well completion, Johnson Sc

Prepared by:Tom Wood

Send Samples to 1950 Old Highway 8, New Brighton, MN 55112

Attachment 2

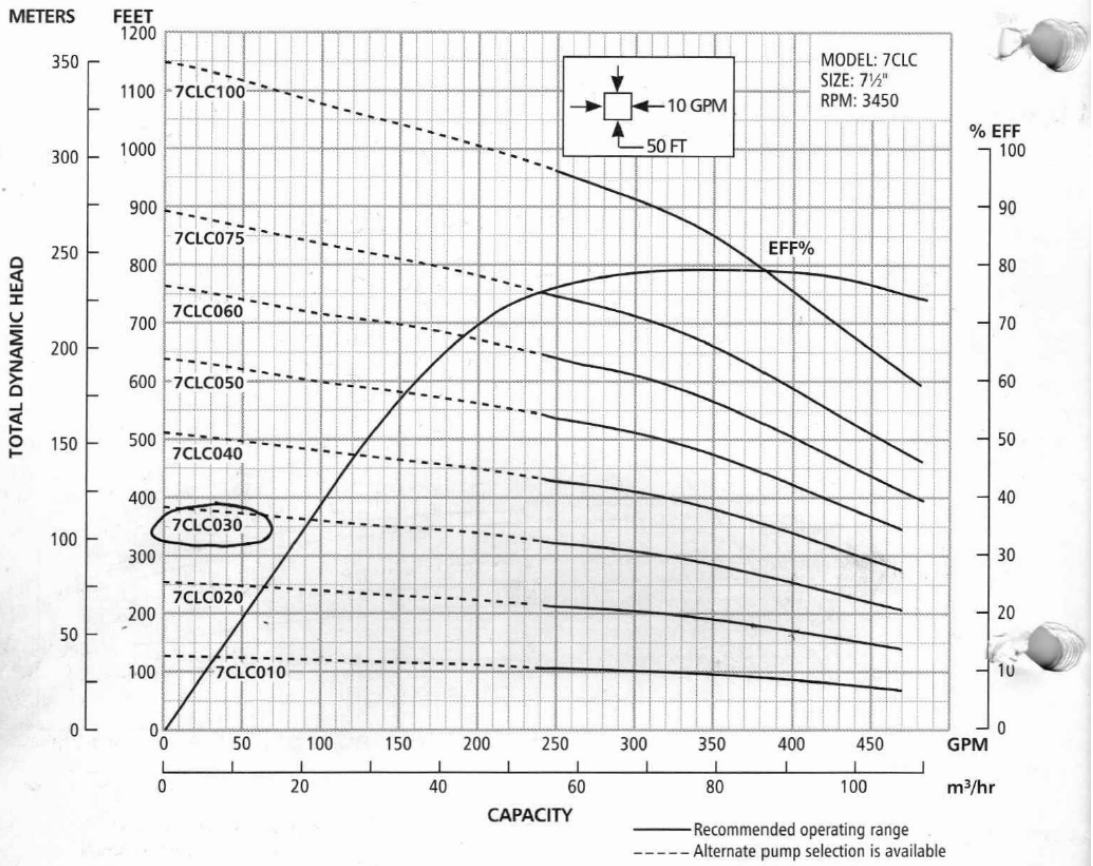
Test Pump Curve

Aquifer Test Plots

Sand Content Test Results

Model 7CLC 350 GPM

GOULDS PUMPS

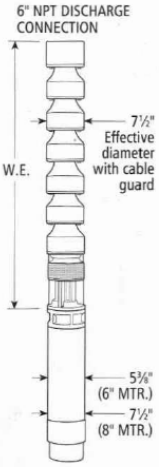


DIMENSIONS AND WEIGHTS

HP	Stages	W.E. Order Number	W.E. Length	W.E. Wt. (lbs.)
10	1	7CLC01066ATS	22.9	75
20	2	7CLC02066ATS	29.3	103
30	3	7CLC03066ATS	35.6	131
40	4	7CLC04066ATS	42.0	159
50	5	7CLC05066ATS	48.4	187
60	6	7CLC06066ATS	54.8	215
75	7	7CLC07586ATS	62.8	255
100	9	7CLC10086ATS	75.6	311

(All dimensions in inches and weights in lbs. Do not use for construction purposes.)

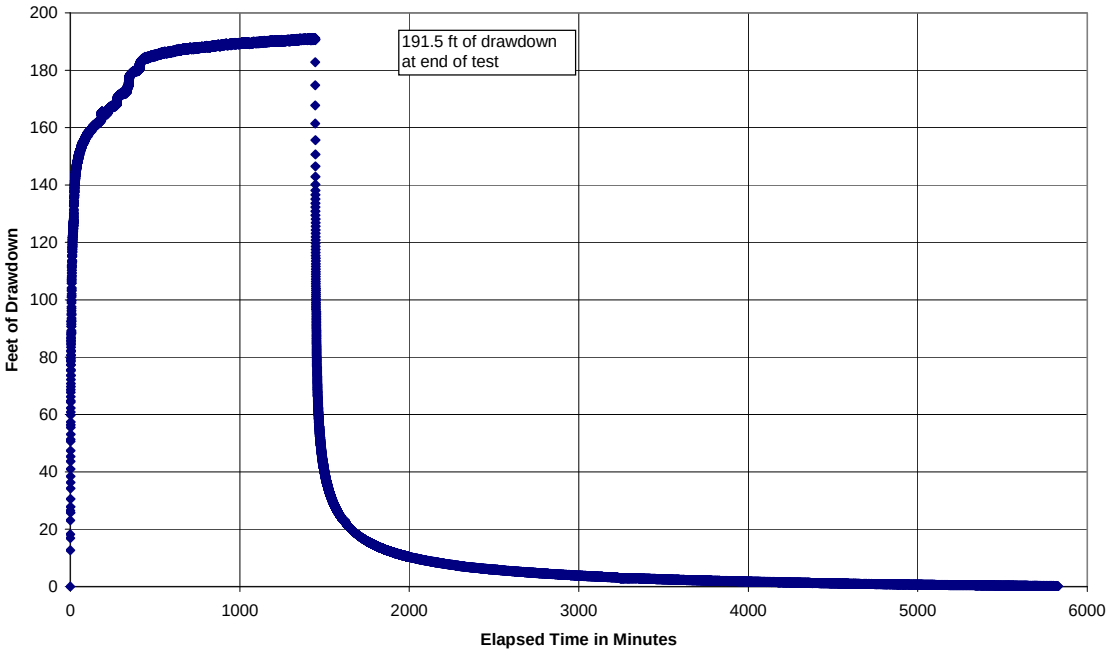
PLEASE NOTE:
- Order motors separately.
- For intermediate horsepower pumps consult factory.
- Solid line is recommended operating range. The dotted line (– – – –) signifies an alternate pump selection is available.
- Please specify all options changes in W.E. order number.

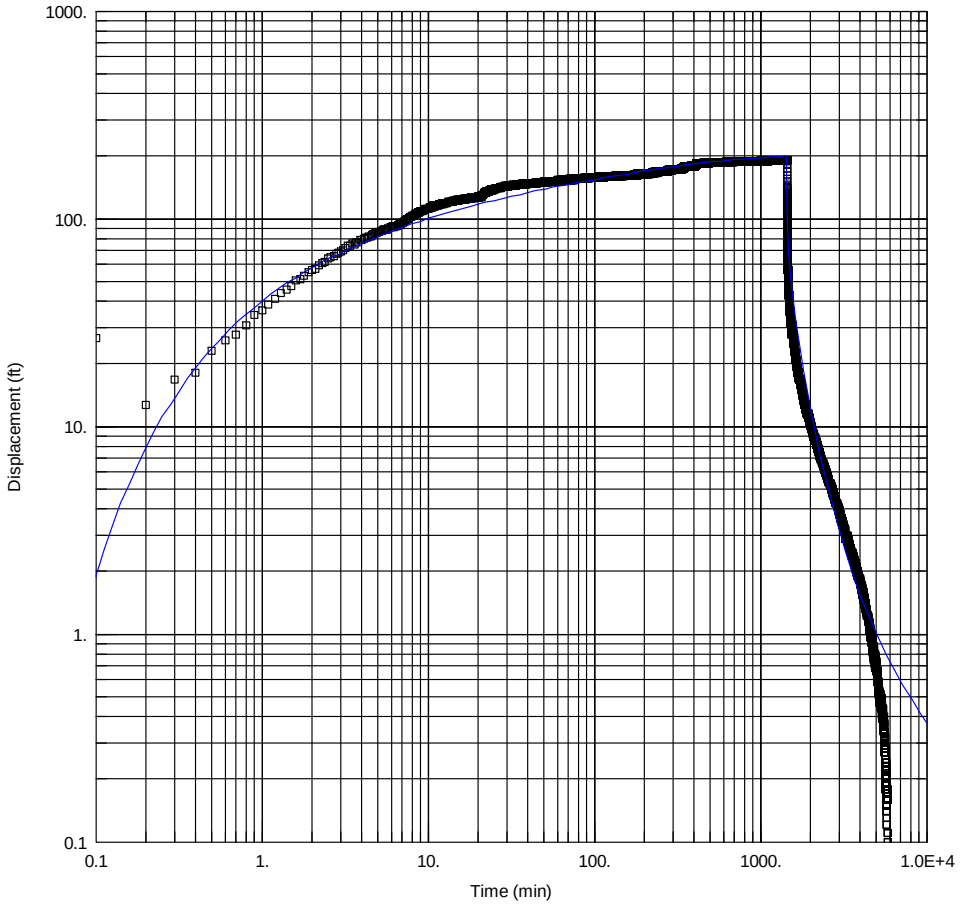


MATERIALS OF CONSTRUCTION

Part Name	Material
Shaft	ASTM A582 TYPE 416
Coupling	ASTM A582 S41600 CD
Suction Adapter	Ductile Iron ASTM A536
Discharge Bowl	ASTM A48 CL 30B
Rubber Bearings	RUBBER
Optional Bronze Bearings	ASTM B584
Discharge Bowl Bearing	ASTM B584
Taperlocks	ASTM A108 GR 101B
Bowl	ASTM A48 CL 30B
Upthrust Collar	Polyethylene
Impeller	ASTM B584
Fasteners	SAEJ429 GR 8
Cable Guard	ASTM A240 S 30400
Suction Strainer	ASTM A240 S 30400

Pumping and recovery test for City of McCammon Bitton Well
Average Pumping Rate 206 gpm, July 11-14, 2013





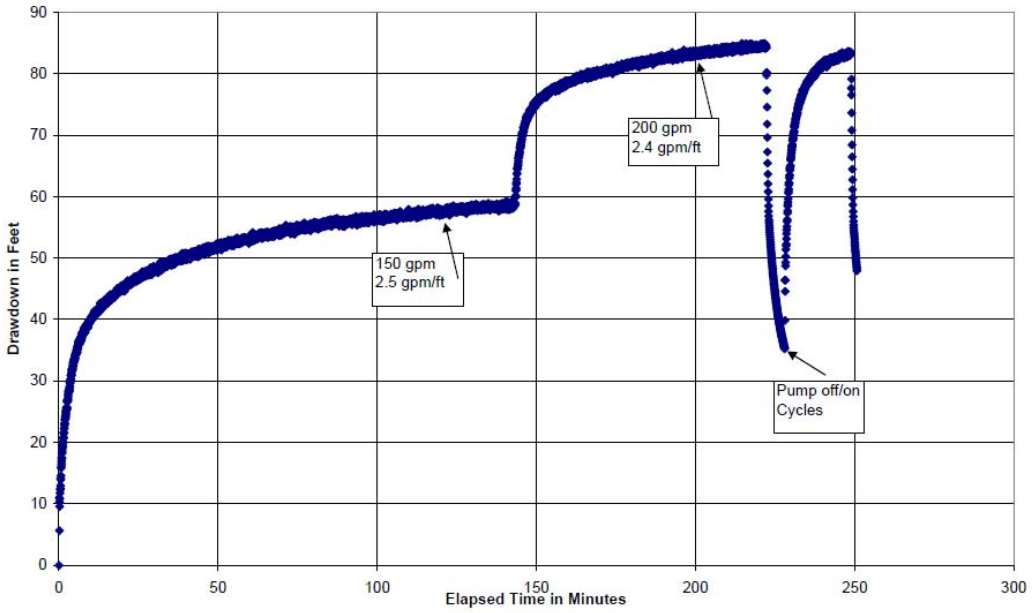
Obs. Wells
Bitton Acres

Aquifer Model
Leaky

Solution
Neuman-Witherspoon

Parameters
T = 77.62 ft^2/day
S = 0.163
r/B = 0.1
ß = 0.1
T2 = 1440. ft^2/day
S2 = 0.001

Preliminary Bitton Acres Well Test with no screen, June 11, 2013



Sand Content Data Sheet
Rossum Sand Tester

Test Number	Date	Time	Flow Rate	Volume of Sand in Rossum Sand Tester	Parts per Million by volume

REGISTERED PROFESSIONAL GEOLOGIST
THOMAS R WOOD
NO. 643
STATE OF IDAHO

Attachment 3

Water Quality Results

LAB FEDERAL ID#: ID00952	DATE REPORTED BY LAB: 8/9/2013
DATE RECEIVED: 7/10/2013	
COMPLIANCE SAMPLE:	REPLACEMENT SAMPLE:
PWS #:	PWS NAME: Water Testing
CONTACT NAME: Rich Pierson	CONTACT PHONE: 208-254-3200

IAS EnviroChem
3314 Pole Line Rd.
Pocatello, ID 83201
phone: (208) 237-3300
fax: (208) 237-3336
email: iasec3308@iasenvirochem.com
www.iasenvirochem.com

LAB SAMPLE NUMBER: I307101-01	COLLECTION DATE/TIME: 07/10/13 16:00
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: BittonWell - Temp manifold

INORGANIC CHEMICAL ANALYSIS REPORT For Public Water Systems

FRDS	*Compound*	*Result*	*Units*	*MCL*	*MDL*	*Method*	*Analysis Date*	*Analyst*
	PRIMARY IOC CONTAMINANTS (Mandatory, except for transient water systems)							
1074	Antimony	ND	mg/L	0.006	0.001	200.8	07/15/2013	RP
1010	Barium	0.177	mg/L	2	0.001	200.8	07/15/2013	RP
1075	Beryllium	ND	mg/L	0.004	0.001	200.8	07/15/2013	RP
1015	Cadmium	ND	mg/L	0.005	0.001	200.8	07/15/2013	RP
1020	Chromium	0.001	mg/L	0.1	0.001	200.8	07/15/2013	RP
1025	Fluoride	0.3	mg/L		0.1	300.0	07/11/2013	RP
1035	Mercury	ND	mg/L	0.002	0.001	200.8	07/15/2013	RP
1036	Nickel	0.002	mg/L	0.1	0.001	200.8	07/15/2013	RP
1045	Selenium	0.001	mg/L	0.05	0.001	200.8	07/15/2013	RP
1058	Thallium	ND	mg/L	0.002	0.001	200.8	07/15/2013	RP

ND = Not Detected MCL = Maximum Contaminant Level MDL = Method Detection Limit

City of McCammon
Rich Pierson
802 Front Street
McCammon, ID 83250

G. Ryan Pattie
Laboratory Director

LAB FEDERAL ID#: ID00952	DATE REPORTED BY LAB: 8/9/2013
DATE RECEIVED: 7/10/2013	
COMPLIANCE SAMPLE:	REPLACEMENT SAMPLE:
PWS #:	PWS NAME: Water Testing
CONTACT NAME: Rich Pierson	CONTACT PHONE: 208-254-3200

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LAB SAMPLE NUMBER: I307101-01	COLLECTION DATE/TIME: 07/10/13 16:00
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: BittonWell - Temp manifold

PUBLIC DRINKING WATER SYSTEM RADIOLOGICAL ANALYSIS REPORT

FRDS	*Test*	*Result*	*Uncert.*	*Units*	*MCL*	*Method*	*Analysis Date*	*Analyst*
4002	Gross Alpha	2.94	+/- 1.20	pCi/L	15	900.0	7/18/2013	SUB
4020	Radium-226	0.28	+/- 0.09	pCi/L		903.0	7/24/2013	SUB
4030	Radium-228	0.91	+/- 0.41	pCi/L		904.0	7/29/2013	SUB

ND = Not Detected MCL = Maximum Contaminant Level MDL = Method Detection Limit SUB - PA00153

City of McCammon
Rich Pierson
802 Front Street
McCammon, ID 83250

G. Ryan Pattie
Laboratory Director

LAB FEDERAL ID#: ID00952	DATE REPORTED BY LAB: 8/9/2013
DATE RECEIVED: 7/10/2013	
COMPLIANCE SAMPLE:	REPLACEMENT SAMPLE:
PWS #:	PWS NAME: Water Testing
CONTACT NAME: Rich Pierson	CONTACT PHONE: 208-254-3200

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LAB SAMPLE NUMBER: I307101-01	COLLECTION DATE/TIME: 07/10/13 16:00
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: BittonWell - Temp manifold

Public Drinking Water Systems Disinfection Byproduct (DBP) Analysis Report

FRDS	Compound	Result	Units	MCL	MDL	Method	Analysis Date	Analyst
	Disinfection Byproducts							
2941	Chloroform	0.68	ug/L		0.25	EPA 524.2	7/19/2013	SUB
2942	Bromoform	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2943	Bromodichloromethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2944	Dibromochloromethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2950	Total Trihalomethanes	0.68	ug/L	80	0.25	EPA 524.2	7/19/2013	SUB

ND = Not Detected MCL = Maximum Contaminant Level MDL = Method Detection Limit SUB - AT 125

City of McCammon
Rich Pierson
802 Front Street
McCammon, ID 83250

G. Ryan Pattie
Laboratory Director

LAB FEDERAL ID#: ID00952	DATE REPORTED BY LAB: 8/9/2013
DATE RECEIVED: 7/10/2013	
COMPLIANCE SAMPLE:	REPLACEMENT SAMPLE:
PWS #:	PWS NAME: Water Testing
CONTACT NAME: Rich Pierson	CONTACT PHONE: 208-254-3200

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LAB SAMPLE NUMBER: I307101-01	COLLECTION DATE/TIME: 07/10/13 16:00
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: BittonWell - Temp manifold

Public Drinking Water Systems Synthetic Organic Chemical (SOC) Analysis Report

FRDS	Compound	Result	Units	MCL	MDL	Method	Analysis Date	Analyst
	Regulated SOC Contaminants							
2931	DBCP	ND	ug/L	0.2	0.04	EPA 504.1	7/22/2013	SUB
2946	EDB	ND	ug/L	0.05	0.02	EPA 504.1	7/22/2013	SUB
2005	Endrin	ND	ug/L	2	0.02	EPA 505	7/25/2013	SUB
2010	Lindane	ND	ug/L	0.2	0.02	EPA 505	7/25/2013	SUB
2015	Methoxychlor	ND	ug/L	40	0.1	EPA 505	7/25/2013	SUB
2020	Toxaphene	ND	ug/L	3	1	EPA 505	7/25/2013	SUB
2065	Heptachlor	ND	ug/L	0.4	0.04	EPA 505	7/25/2013	SUB
2067	Heptachlor epoxide	ND	ug/L	0.2	0.02	EPA 505	7/25/2013	SUB
2383	PCBs	ND	ug/L	0.5	0.01	EPA 505	7/25/2013	SUB
2959	Chlordane	ND	ug/L	2	0.1	EPA 505	7/25/2013	SUB
2031	Dalapon	ND	ug/L	200	0.1	EPA 515.3	7/23/2013	SUB
2040	Picloram	ND	ug/L	500	0.1	EPA 515.3	7/23/2013	SUB
2041	Dinoseb	ND	ug/L	7	0.1	EPA 515.3	7/23/2013	SUB
2105	2,4-D	ND	ug/L	70	0.1	EPA 515.3	7/23/2013	SUB
2110	2,4,5-TP	ND	ug/L	50	0.1	EPA 515.3	7/23/2013	SUB
2326	Pentachlorophenol	ND	ug/L	1	0.08	EPA 515.3	7/23/2013	SUB
2035	Di(2-ethylhexyl)adipate	ND	ug/L	400	0.2	EPA 525.2	7/29/2013	SUB
2037	Simazine	ND	ug/L	4	0.15	EPA 525.2	7/29/2013	SUB
2042	Hexachlorocyclopentadiene	ND	ug/L	50	0.2	EPA 525.2	7/29/2013	SUB
2050	Atrazine	ND	ug/L	3	0.2	EPA 525.2	7/29/2013	SUB
2051	Alachlor	ND	ug/L	2	0.4	EPA 525.2	7/29/2013	SUB
2274	Hexachlorobenzene	ND	ug/L	1	0.2	EPA 525.2	7/29/2013	SUB
2039	Di(2-ethylhexyl)phthalate	ND	ug/L	6	0.6	EPA 525.2	7/19/2013	SUB
2306	Benzo (a) pyrene	ND	ug/L	0.2	0.02	EPA 525.2	7/19/2013	SUB
2036	Oxamyl	ND	ug/L	200	4	EPA 531.2	7/29/2013	SUB
2046	Carbofuran	ND	ug/L	40	2	EPA 531.2	7/29/2013	SUB
2034	Glyphosate	ND	ug/L	700	10	EPA 547	7/24/2013	SUB
2033	Endothall	ND	ug/L	100	9	EPA 548.1	7/25/2013	SUB
2032	Diquat	ND	ug/L		0.8	EPA 549.2	7/26/2013	SUB
	Unregulated SOC Contaminants							
2356	Aldrin	ND	ug/L		0.2	EPA 505	7/25/2013	SUB
2070	Dieldrin	ND	ug/L		0.2	EPA 505	7/25/2013	SUB
2440	Dicamba	ND	ug/L		0.1	EPA 515.3	7/23/2013	SUB
	2,4-DB	ND	ug/L		0.1	EPA 515.3	7/23/2013	SUB

LAB FEDERAL ID#: ID00952	DATE REPORTED BY LAB: 8/9/2013
DATE RECEIVED: 7/10/2013	
COMPLIANCE SAMPLE:	REPLACEMENT SAMPLE:
PWS #:	PWS NAME: Water Testing
CONTACT NAME: Rich Pierson	CONTACT PHONE: 208-254-3200

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LAB SAMPLE NUMBER: I307101-01	COLLECTION DATE/TIME: 07/10/13 16:00
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: BittonWell - Temp manifold

Public Drinking Water Systems Synthetic Organic Chemical (SOC) Analysis Report

FRDS	*Compound*	*Result*	*Units*	*MCL*	*MDL*	*Method*	*Analysis Date*	*Analyst*
	Unregulated SOC Contaminants							
2076	Butachlor	ND	ug/L		0.4	EPA 525.2	7/29/2013	SUB
2045	Metolachlor	ND	ug/L		1	EPA 525.2	7/29/2013	SUB
2595	Metribuzin	ND	ug/L		0.2	EPA 525.2	7/29/2013	SUB
2077	Propachlor	ND	ug/L		0.2	EPA 525.2	7/29/2013	SUB
2047	Aldicarb	ND	ug/L		2	EPA 531.2	7/29/2013	SUB
2044	Aldicarb sulfone	ND	ug/L		0.7	EPA 531.2	7/29/2013	SUB
2043	Aldicarb sulfoxide	ND	ug/L		1.8	EPA 531.2	7/29/2013	SUB
2021	Carbaryl	ND	ug/L		2	EPA 531.2	7/29/2013	SUB
2066	3-Hydroxycarbofuran	ND	ug/L		2	EPA 531.2	7/29/2013	SUB
2022	Methomyl	ND	ug/L		1	EPA 531.2	7/29/2013	SUB

ND = Not Detected MCL = Maximum Contaminant Level MDL = Method Detection Limit SUB - AT 125

City of McCammon
Rich Pierson
802 Front Street
McCammon, ID 83250

G. Ryan Pattie
Laboratory Director

LAB FEDERAL ID#: ID00952	DATE REPORTED BY LAB: 8/9/2013
DATE RECEIVED: 7/10/2013	
COMPLIANCE SAMPL:	REPLACEMENT SAMPL
PWS #:	PWS NAME: Water Testing
CONTACT NAME: Rich Pierson	CONTACT PHONE: 208-254-3200

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LAB SAMPLE NUMBER: I307101-01	COLLECTION DATE/TIME: 07/10/13 16:00
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: BittonWell - Temp manifold

Public Drinking Water Systems Volatile Organic Chemical (VOC) Analysis Report

FRDS	Compound	Result	Units	MCL	MDL	Method	Analysis Date	Analyst
	Regulated VOC Contaminants							
2378	1,2,4-Trichlorobenzene	ND	ug/L	70	0.5	EPA 524.2	7/19/2013	SUB
2380	c-1,2- Dichloroethene	ND	ug/L	70	0.5	EPA 524.2	7/19/2013	SUB
2950	Total Trihalomethanes	0.68	ug/L	80	0.25	EPA 524.2	7/19/2013	SUB
2941	Chloroform	0.68	ug/L		0.25	EPA 524.2	7/19/2013	SUB
2942	Bromoform	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2943	Bromodichloromethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2944	Dibromochloromethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2955	Xylenes (total)	ND	ug/L	10000	0.5	EPA 524.2	7/19/2013	SUB
2964	Dichloromethane	ND	ug/L	5	0.5	EPA 524.2	7/19/2013	SUB
2968	o-Dichlorobenzene	ND	ug/L	600	0.5	EPA 524.2	7/19/2013	SUB
2969	p-Dichlorobenzene	ND	ug/L	75	0.5	EPA 524.2	7/19/2013	SUB
2976	Vinyl chloride	ND	ug/L	2	0.5	EPA 524.2	7/19/2013	SUB
2977	1,1-Dichloroethylene	ND	ug/L	7	0.5	EPA 524.2	7/19/2013	SUB
2979	t-1,2-Dichloroethylene	ND	ug/L	100	0.5	EPA 524.2	7/19/2013	SUB
2980	1,2-Dichloroethane	ND	ug/L	5	0.5	EPA 524.2	7/19/2013	SUB
2981	1,1,1-Trichloroethane	ND	ug/L	200	0.5	EPA 524.2	7/19/2013	SUB
2982	Carbon Tetrachloride	ND	ug/L	5	0.5	EPA 524.2	7/19/2013	SUB
2983	1,2-Dichloropropane	ND	ug/L	5	0.5	EPA 524.2	7/19/2013	SUB
2984	Trichloroethylene	ND	ug/L	5	0.5	EPA 524.2	7/19/2013	SUB
2985	1,1,2-Trichloroethane	ND	ug/L	5	0.5	EPA 524.2	7/19/2013	SUB
2987	Tetrachloroethylene	ND	ug/L	5	0.5	EPA 524.2	7/19/2013	SUB
2989	Monochlorobenzene	ND	ug/L	100	0.5	EPA 524.2	7/19/2013	SUB
2990	Benzene	ND	ug/L	5	0.5	EPA 524.2	7/19/2013	SUB
2991	Toluene	ND	ug/L	1000	0.5	EPA 524.2	7/19/2013	SUB
2992	Ethyl Benzene	ND	ug/L	700	0.5	EPA 524.2	7/19/2013	SUB
2996	Styrene	ND	ug/L	100	0.5	EPA 524.2	7/19/2013	SUB
	Unregulated VOC Contaminants							
2993	Bromobenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2430	Bromochloromethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2214	Bromomethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2422	n-Butylbenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2428	s-Butylbenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2426	t-Butylbenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2216	Chloroethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2210	Chloromethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2965	o-Chlorotoluene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2966	p-Chlorotoluene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB

LAB FEDERAL ID#	DATE REPORTED BY LAB
ID00952	8/9/2013
DATE RECEIVED: 7/10/2013	
COMPLIANCE SAMPL	REPLACEMENT SAMPL
PWS #:	PWS NAME: Water Testing
CONTACT NAME: Rich Pierson	CONTACT PHONE: 208-254-3200

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www.iasenvirochem.com

LAB SAMPLE NUMBER: I307101-01	COLLECTION DATE/TIME: 07/10/13 16:00
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: BittonWell - Temp manifold

Public Drinking Water Systems Volatile Organic Chemical (VOC) Analysis Report

FRDS	*Compound*	*Result*	*Units*	*MCL*	*MDL*	*Method*	*Analysis Date*	*Analyst*
	Unregulated VOC Contaminants							
2408	Dibromomethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2967	m-Dichlorobenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2212	Dichlorodifluoromethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2978	1,1-Dichloroethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2413	1,3-Dichloropropene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2416	2,2-Dichloropropane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2410	1,1-dichloropropene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2412	1,3-Dichloropropane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2246	Hexachlorobutadiene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2994	Isopropylbenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2030	p-Isopropyltoluene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2248	Naphthalene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2998	n-Propylbenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2986	1,1,1,2-Tetrachloroethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2988	1,1,2,2-Tetrachloroethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2420	1,2,3-Trichlorobenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2218	Trichlorofluoromethane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2414	1,2,3-Trichloropropane	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2424	1,3,5-Trimethylbenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB
2418	1,2,4- Trimethylbenzene	ND	ug/L		0.5	EPA 524.2	7/19/2013	SUB

ND = Not Detected MCL = Maximum Contaminant Level MDL = Method Detection Limit SUB - AT 125

City of McCammon
Rich Pierson
802 Front Street
McCammon, ID 83250

G. Ryan Pattie
Laboratory Director

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Phone: (208) 237-3300 • Fax: (208) 237-3336
email: iasec3308@iasenvirochem.com • www.iasenvirochem.com

City of McCammon
Rich Pierson
802 Front Street
McCammon, ID 83250

Date Submitted: 07/10/2013
Date Reported: 08/09/2013

Certificate of Analysis

Sample Description: BittonWell - Temp manifold
Lab Tracking #: I307101-01
Sampling Date/Time: 07/10/13 16:00

Analyte	*Result*	*Units*	*Method*	*Analyzed*	*Analyst*
E. coli	< 1.0	MPN/100 mL	SM9223B	07/11/2013	RP
Total Coliforms	1.0	MPN/100 mL	SM9223B	07/11/2013	RP

ND = Not Detected
All solids are reported on a dry weight basis unless otherwise noted.

G. Ryan Pattie
Laboratory Director

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Login Report

Customer Name: **City of McCammon**
802 Front Street
McCammon, ID 83250

Work Order #: **I307101**

Contact Name: **Rich Pierson**
Comment:

Sample Description: **BittonWell - Temp manifold**
Lab Tracking #: **I307101-01**
Matrix: **Drinking Water**
Sample Notes:

Sampling Date/Time: **07/10/13 16:00**
Date Received: **07/10/13 17:00**

Test	Method	Due
Antimony	200.8	07/30/13
Barium	200.8	07/30/13
Beryllium	200.8	07/30/13
Arsenic	200.8	07/30/13
Chromium	200.8	07/30/13
E. coli	SM9223B	07/30/13
Fluoride	300.0	07/30/13
Gross Alpha	900.0	07/30/13
Mercury	200.8	07/30/13
Nickel	200.8	07/30/13
Radium 226	903.0	07/30/13
Radium 228	904.0	07/30/13
Selenium	200.8	07/30/13
SOC 504.1 (DBCP-EDB)	EPA 504.1	07/30/13
SOC 505 (Pesticides)	EPA 505	07/30/13
SOC 515.3 (Herbicides)	EPA 515.3	07/30/13
SOC 525.2 (Semivolatile)	EPA 525.2	07/30/13
SOC 531.1 (Carbamates)	EPA 531.2	07/30/13
SOC 547 (Glyphosate)	EPA 547	07/30/13
SOC 548.1 (Endothall)	EPA 548.1	07/30/13
SOC 549.2 (Diquat)	EPA 549.2	07/30/13
Thallium	200.8	07/30/13
Total Coliform MPN	SM9223B	07/30/13
TTHM	EPA 524.2	07/30/13
VOC	EPA 524.2	07/30/13

Sample Condition Record

Samples received in a cooler?	Yes
Samples received intact?	Yes
The temperature recorded?	6.1
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all samples properly preserved?	Yes
Labels and chain agree?	Yes

1307101
Clearwater Geosciences
Received: 07/10/2013
MSP
1 Sample

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Idaho Chain of Custody - Drinking Water Analysis

Company:	Clearwater Geosciences	PWS #:	
Water System Name:	City of McCammon, Bitton Well	County:	
Contact / Project Manger:	Tom Wood / Marvin Fielding	Phone:	208-589-5555
Address:	1818 E 49th S	Email:	thomasrwood@gmail.com
City, State, Zip:	Idaho Falls, ID 83404		

Payment Options

Send Bill or Receipt To: City of McCammon — Amount $ ____
Payment due with samples unless credit has been established — Received by ____
Email Invoice to: ____

☐ Cash ☐ Bill ☐ Check# ☐ PO # ☐ Other

Sample Information For all samples, Public and Private	Sample Type
Sample Collected By: Tom Wood	☐ Distribution ☐ Raw Water
Sample Collection Location: Bitton Well - temp Manifold (Name of well or other source for sample collected at the source. A different chain of custody should be used for each location collected from.)	☐ Non-Compliance ☐ Plant Tap
	☑ Other Construction
Date Sample Taken 7/10/13	Time Sample Taken AM ☑ PM

For Public Water System Source Samples	Public Water System Jurisdiction
Location Tag # ____	**A copy of report to be sent to:** (Regulator)

CHECK DESIRED ANALYSIS

IOCs
- ☐ Arsenic ☐ Sodium ☐ Nitrate ☐ Nitrite
- ☐ Copper/Lead ☐ Sulfate
- ☐ Phase II IOC metals: Ba, Cd, Cr, F, Hg, Se
- ☐ Phase V IOC: Be, Ni, Sb, Tl
- ☐ Primary IOC package with Cyanide Waiver: Ba, Be, Cd, Cr, Hg, Ni, Sb, Se, Tl, Fluoride
- ☐ Secondary/Optional IOC package: Ag, Al, Ca, Cu, Fe, K, Mg, Mn, Pb, Zn, Chloride, Ammonia, Hydrogen Sulfide, Silica, Color, Hardness, Odor, pH, Conductivity, Alkalinity, TDS, Langlier Index Corrosivity, Surfactants
- ☐ Complete IOC package: Ag, Al, As, Ba, Be, Ca, Cd, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Se, Sb, Tl, Zn, Chloride, Fluoride, Nitrate, Nitrite, Sulfate, Ammonia, Hydrogen Sulfide, Silica, Color, Hardness, Odor, pH, Conductivity, Alkalinity, TDS, Langlier Index Corrosivity, Surfactants
- ☐ Cyanide

VOCs
- ☑ VOC 524.2
- ☑ TTHM
- ☐ Haloacetic Acids (HAA5)

RADs
- ☑ Gross Alpha
- ☐ Gross Beta
- ☑ Radium 226
- ☑ Radium 228
- ☐ Uranium

SOCs
- ☑ Full SOC (all 8 below)
- ☐ Phase II SOC (all 5 below)
  - ☐ Semivolatiles (525.2)
  - ☐ Herbicides (515.1)
  - ☐ Carbamates (531.1)
  - ☐ Pesticides (505)
  - ☐ EDB/DBCP (504.1)
- ☐ Phase V SOC (all 3 below)
  - ☐ Diquat (549.1)
  - ☐ Endothall (548.1)
  - ☐ Glyphosate (547)

Other (specify)
Total coliform
E. Coli
Full DEQ suite for D.W. well
☐ Bromate

Sample Submitted By: [signature]
Shipping or Delivery Date: 7/10/13

Received By: MP
Received Date/Time: 7/10/13 5PM
Temp. °C: 6.1°C
Samples received in a cooler? Y / N

LAB FEDERAL ID#: **ID00952**	DATE REPORTED BY LAB: **6/24/2013**
DATE RECEIVED: **6/11/2013**	
COMPLIANCE SAMPLE:	REPLACEMENT SAMPLE:
PWS #:	PWS NAME: **Clear Water Geosciences**
CONTACT NAME: **Tom Wood**	CONTACT PHONE: **208-589-5555**

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LAB SAMPLE NUMBER: **I306083-01**	COLLECTION DATE/TIME: **06/11/13 12:15**
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: **Temp Well Head**

INORGANIC CHEMICAL ANALYSIS REPORT For Public Water Systems

FRDS	*Compound*	*Result*	*Units*	*MCL*	*MDL*	*Method*	*Analysis Date*	*Analyst*
PRIMARY IOC CONTAMINANTS (Mandatory, except for transient water systems)								
1005	Arsenic	0.003	mg/L	0.01	0.001	200.8	06/18/2013	RP
1028	Iron	0.62	mg/L	SEC	0.01	200.8	06/18/2013	RP
1040	Nitrate as N	ND	mg/L	10	1.00	300.0	06/12/2013	AMN
1041	Nitrite as N	ND	mg/L	1	0.10	300.0	06/12/2013	AMN

ND = Not Detected MCL = Maximum Contaminant Level MDL = Method Detection Limit

Clearwater Geosciences
Tom Wood
510 E.17th St #205
Idaho Falls, ID 83404

G. Ryan Pattie
Laboratory Director

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Login Report

Customer Name: **Clearwater Geosciences**
510 E.17th St #205
Idaho Falls, ID 83404

Work Order #: **I306083**

Contact Name: **Tom Wood**
Comment:

Sample Description: **Temp Well Head**
Lab Tracking #: **I306083-01**
Matrix: **Drinking Water**
Sample Notes:

Sampling Date/Time: **06/11/13 12:15**
Date Received: **06/11/13 14:45**

Test	*Method*	*Due*
Arsenic	**200.8**	**06/25/13**
Iron	**200.8**	**06/25/13**
Nitrate:N	**300.0**	**06/25/13**
Nitrite:N	**300.0**	**06/25/13**

Sample Condition Record

Samples received in a cooler?	Yes
Samples received intact?	Yes
The temperature recorded?	6.9
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all samples properly preserved?	Yes
Labels and chain agree?	Yes

Clearwater Geosciences, LLP
Ground Water Development and Exploration

1306083
Clearwater Geosciences
Received: 06/11/2013
MSP
1 Sample

IAS EnviroChem

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email: iasec3308@iasenvirochem.com • www.iasenvirochem.com

Idaho Chain of Custody - Drinking Water Analysis

Company:	Clearwater Geosciences	PWS #:	
Water System Name:	McCammon Bi Hon Hall	County:	
Contact / Project Manger:	Tom Wood	Phone:	589-5555
Address:	1818 E 49th S	Email:	thomessw ood@gmail.com
City, State, Zip:	Idaho Falls, ID 83404		

Payment Options

Send Bill or Receipt To: _____ Amount $ _____
Payment due with samples unless credit has been established _____ Received by _____
Email Invoice to: _____

☐ Cash ☐ Bill ☑ Check# ☐ PO # ☐ Other

Sample Information For all samples, Public and Private	Sample Type
Sample Collected By: Tom Wood	☐ Distribution ☐ Raw Water
Sample Collection Location: Temp well head (Name of well or other source for sample collected at the source. A different chain of custody should be used for each location collected from.)	☐ Non-Compliance ☐ Plant Tap
	☑ Other Construction
Date Sample Taken 6/11/13	Time Sample Taken AM PM

For Public Water System Source Samples	Public Water System Jurisdiction
Location Tag # _____	**A copy of report to be sent to:** (Regulator)

CHECK DESIRED ANALYSIS

IOCs
- ☑ Arsenic ☐ Sodium ☑ Nitrate ☑ Nitrite
- ☐ Copper/Lead ☐ Sulfate
- ☐ Phase II IOC metals: Ba, Cd, Cr, F, Hg, Se
- ☐ Phase V IOC: Be, Ni, Sb, Tl
- ☐ Primary IOC package with Cyanide Waiver: Ba, Be, Cd, Cr, Hg, Ni, Sb, Se, Tl, Fluoride
- ☐ Secondary/Optional IOC package: Ag, Al, Ca, Cu, Fe, K, Mg, Mn, Pb, Zn, Chloride, Ammonia, Hydrogen Sulfide, Silica, Color, Hardness, Odor, pH, Conductivity, Alkalinity, TDS, Langlier Index Corrosivity, Surfactants
- ☐ Complete IOC package: Ag, Al, As, Ba, Be, Ca, Cd, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Se, Sb, Tl, Zn, Chloride, Fluoride, Nitrate, Nitrite, Sulfate, Ammonia, Hydrogen Sulfide, Silica, Color, Hardness, Odor, pH, Conductivity, Alkalinity, TDS, Langlier Index Corrosivity, Surfactants
- ☐ Cyanide

VOCs
- ☐ VOC 524.2
- ☐ TTHM
- ☐ Haloacetic Acids (HAA5)

RADs
- ☐ Gross Alpha
- ☐ Gross Beta
- ☐ Radium 226
- ☐ Radium 228
- ☐ Uranium

SOCs
- ☐ Full SOC (all 8 below)
- ☐ Phase II SOC (all 5 below)
  - ☐ Semivolatiles (525.2)
  - ☐ Herbicides (515.1)
  - ☐ Carbamates (531.1)
  - ☐ Pesticides (505)
  - ☐ EDB/DBCP (504.1)
- ☐ Phase V SOC (all 3 below)
  - ☐ Diquat (549.1)
  - ☐ Endothall (548.1)
  - ☐ Glyphosate (547)

Other (specify)
Fe
☐ Bromate

Sample Submitted By: Tom Wood
Shipping or Delivery Date: 6/11/13

Received By: MP
Received Date/Time: 061113 1445
Temp. °C: 12.09°C
Samples received in a cooler? Y / N

LAB FEDERAL ID#: **ID00952**	DATE REPORTED BY LAB: **6/26/2013**
DATE RECEIVED: **6/25/2013**	
COMPLIANCE SAMPLE:	REPLACEMENT SAMPLE:
PWS #:	PWS NAME: **Clear Water Geosciences**
CONTACT NAME: **Tom Wood**	CONTACT PHONE: **208-589-5555**

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LAB SAMPLE NUMBER: **I306205-01**	COLLECTION DATE/TIME: **06/25/13 00:00**
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: **Well 1, Pump to Waste**

INORGANIC CHEMICAL ANALYSIS REPORT For Public Water Systems

FRDS	*Compound*	*Result*	*Units*	*MCL*	*MDL*	*Method*	*Analysis Date*	*Analyst*
1028	Iron	0.49	mg/L	SEC	0.01	200.8	06/26/2013	RP

ND = Not Detected MCL = Maximum Contaminant Level MDL = Method Detection Limit

LAB FEDERAL ID#: **ID00952**	DATE REPORTED BY LAB: **6/26/2013**
DATE RECEIVED: **6/25/2013**	
COMPLIANCE SAMPLE:	REPLACEMENT SAMPLE:
PWS #:	PWS NAME: **Clear Water Geosciences**
CONTACT NAME: **Tom Wood**	CONTACT PHONE: **208-589-5555**

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LAB SAMPLE NUMBER: **I306205-02**	COLLECTION DATE/TIME: **06/25/13 11:00**
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: **Treasure Well, Hydrant**

INORGANIC CHEMICAL ANALYSIS REPORT For Public Water Systems

FRDS	*Compound*	*Result*	*Units*	*MCL*	*MDL*	*Method*	*Analysis Date*	*Analyst*
1028	Iron	0.35	mg/L	SEC	0.01	200.8	06/26/2013	RP

ND = Not Detected MCL = Maximum Contaminant Level MDL = Method Detection Limit

LAB FEDERAL ID#: **ID00952**	DATE REPORTED BY LAB: **6/26/2013**
DATE RECEIVED: **6/25/2013**	
COMPLIANCE SAMPLE:	REPLACEMENT SAMPLE:
PWS #:	PWS NAME: **Clear Water Geosciences**
CONTACT NAME: **Tom Wood**	CONTACT PHONE: **208-589-5555**

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LAB SAMPLE NUMBER: **I306205-03**	COLLECTION DATE/TIME: **06/25/13 00:00**
SAMPLE TYPE:	SAMPLING POINT/LOCATION - TAG#/FACILITY ID: **Pierson, Hydrant**

INORGANIC CHEMICAL ANALYSIS REPORT For Public Water Systems

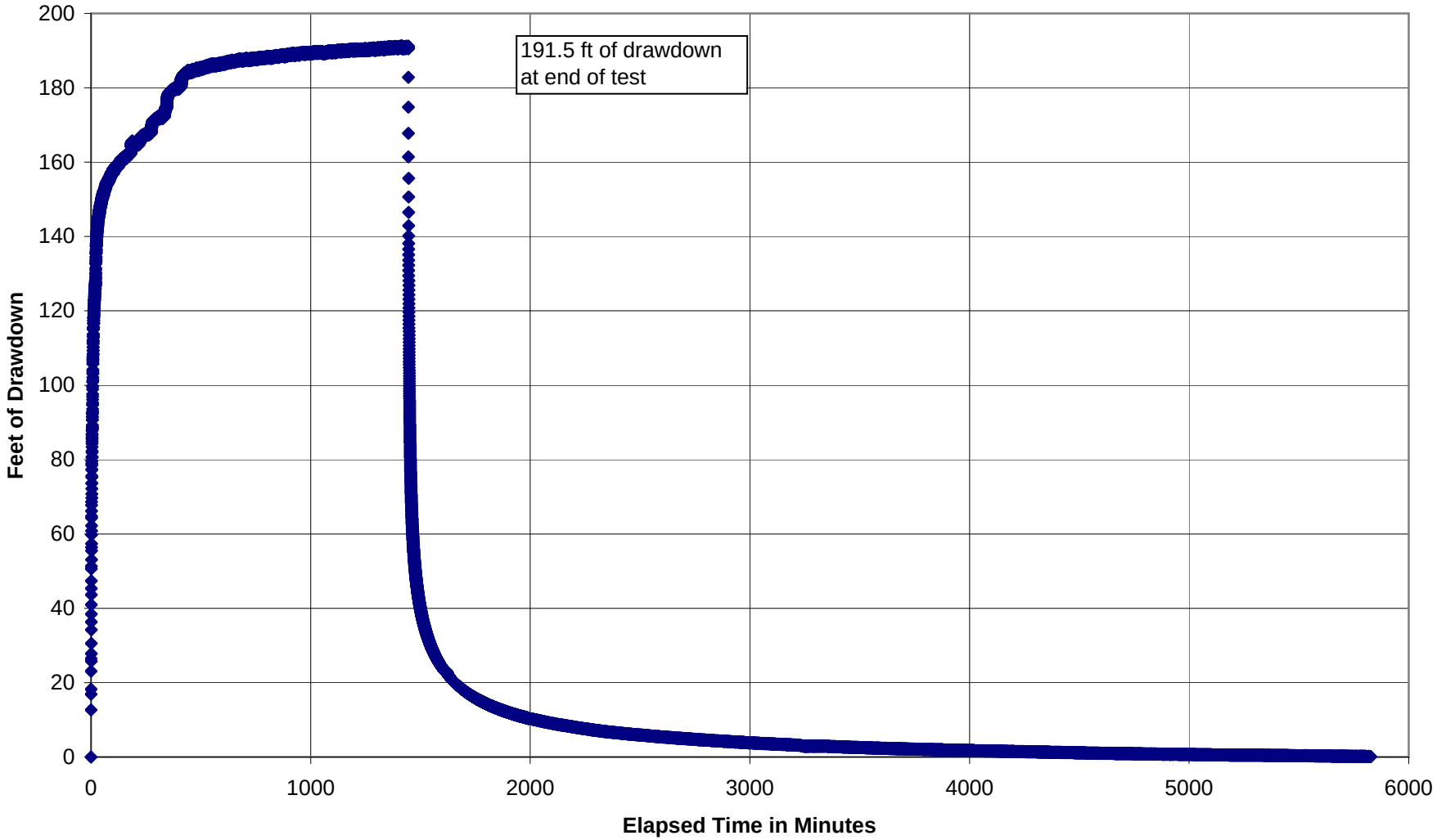
FRDS	*Compound*	*Result*	*Units*	*MCL*	*MDL*	*Method*	*Analysis Date*	*Analyst*
1028	Iron	1.11	mg/L	SEC	0.01	200.8	06/26/2013	RP

ND = Not Detected MCL = Maximum Contaminant Level MDL = Method Detection Limit

Clearwater Geosciences
Tom Wood
510 E.17th St #205
Idaho Falls, ID 83404

G. Ryan Pattie
Laboratory Director

Pumping and recovery test for City of McCammon Bitton Well
Average Pumping Rate 206 gpm, July 11-14, 2013



□□□

Form 238-7
11/97

OMD #7082275

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Inspected by _____
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0011183
DRILLING PERMIT NO. 29-99-E-0060-200
Other IDWR No. _____

2. OWNER:
Name City of McCammon
Address P.O. Box 9
City McCammon State Id Zip 83250-0009

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 9 North ☐ or South ☑
Rge. 36 East ☑ or West ☐
Sec. 13, ____ (10 acres) 1/4 NE (40 acres) 1/4 SW (160 acres) 1/4
Gov't Lot ____ County _____
Lat: : : Long: : :
Address of Well Site Cemetary Rd.
(Give at least name of Road + Distance to Road or Landmark)
City McCammon
Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☐ Domestic ☑ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☑ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD
☐ Air Rotary ☑ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
Bentc	0	70	68 bags	

Was drive shoe used? ☑ Y ☐ N Shoe Depth(s) 180 / 403
Was drive shoe seal tested? ☐ Y ☑ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
14	0	180	250	Steel	☑	☐	☑	☐
12	0	403	375	Steel	☑	☐	☑	☐
					☐	☐	☐	☐

Length of Headpipe 14" Length of Tailpipe _____

9. PERFORATIONS/SCREENS
Perforations Method None
Screens Screen Type " "

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
		None				☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
60 ft. below ground Artesian pressure _____ lb.
Depth flow encountered 78 ft. Describe access port or control devices: _____

11. WELL TESTS:
☑ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
100	300	370	8 hrs

Water Temp. 54 Bottom hole temp. _____
Water Quality test or comments: _____
Depth first Water Encounter 78

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
16	0	8	Clay Sandy		✓
16	8	77	Broken Clay		✓
16	77	78	Gravel Clay Water	✓	
16	78	85	Hard-Clay-Gravel Sandy		✓
14	85	120	" " " "		✓
14	120	130	White Sticky Clay		✓
14	130	140	Clay gravel		✓
14	140	170	Sand, gravel, Clay,	✓	
14	170	180	Hard Sandstone Rock		✓
12	180	200	Hard White Clay		✓
12	200	240	Gray Clay		✓
12	240	330	Gray & Green Sticky Clay		✓
12	330	360	Blue Clay		✓
12	360	365	Blue Clay Sandy		✓
12	365	370	Blue Clay		✓
12	370	380	Hard pan Small Gravel	✓	
12	380	385	Sandstone gray clay		✓
12	385	390	Sticky Blue Clay		✓
12	390	400	Soft green Sandstone Shale		✓
12	400	410	Green shale with sandstone		✓
12	410	425	Soft sandstone little gravel	✓	

RECEIVED
OCT 26 2000
RECEIVED
NOV - 7 2000
Department of Water Resources
Eastern District Office
Department of Water Resources

(385) Ft.

Completed Depth Filled w/washed Gravel (Measurable)
Date: Started July, 3 2000 Completed Sept 21, 00

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

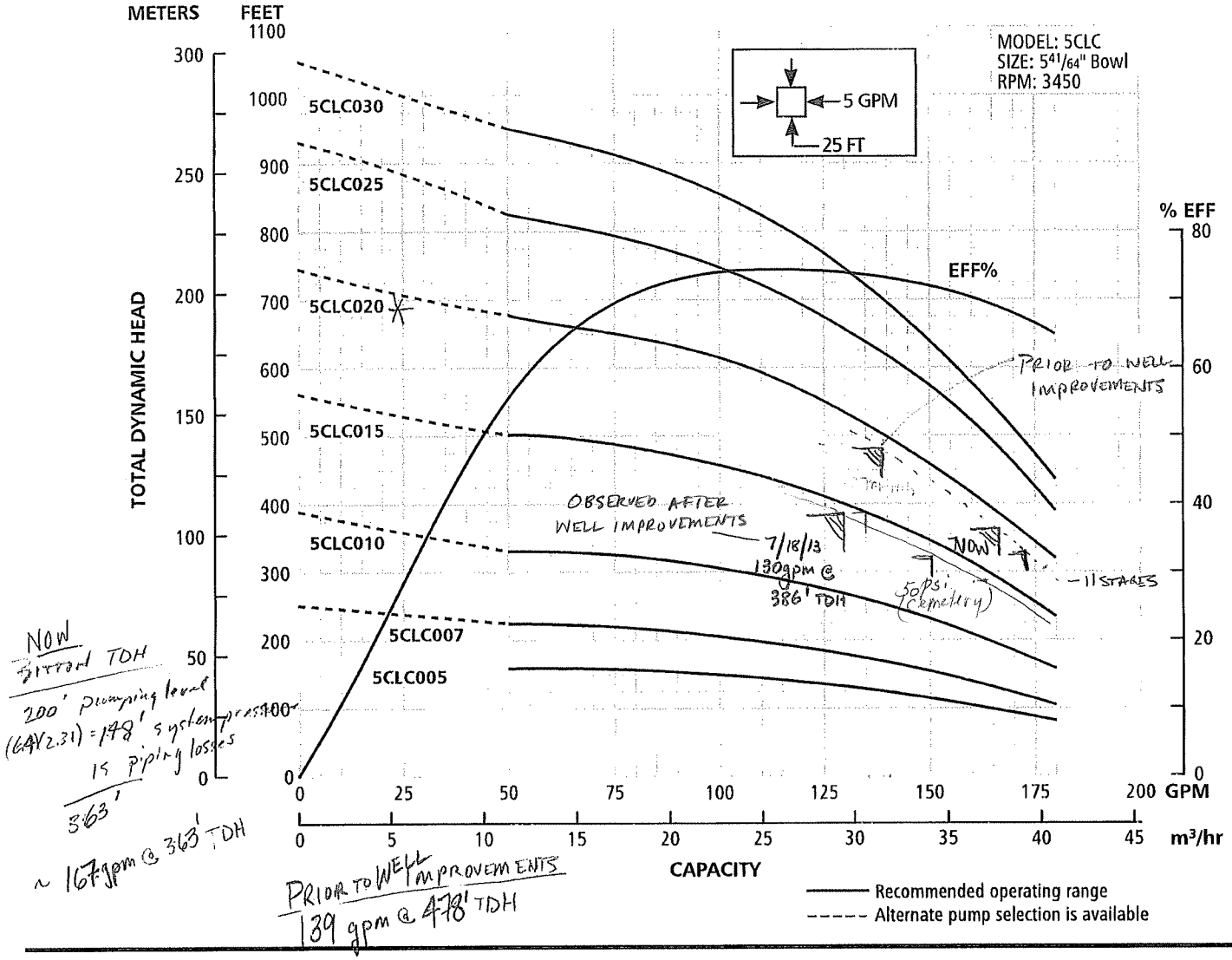
Company Name American Well Drilling Firm No. 538
Firm Official Rallell Rose Date 10/21/00
and
Driller or Operator Rallell Rose Date 10/21/00
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Bitton Well Log

Model 5CLC 110 GPM

GOULDS PUMPS

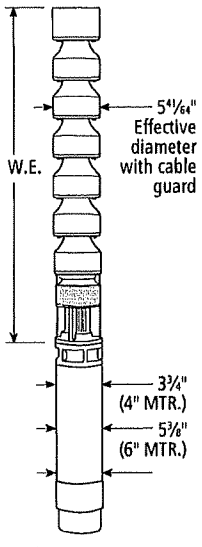


DIMENSIONS AND WEIGHTS

HP	Stages	W.E. Order Number	W.E. Length	W.E. Wt. (lbs.)
5	3	05CLC00544CTB	25.2	70
		05CLC00564CTB	27.5	75
7.5	4	05CLC00744CTB	29.8	83
		05CLC00764CTB	32.1	88
10	6	05CLC01064CTB	41.4	114
15	9	05CLC01564CTB	55.3	153
20	12	05CLC02064CTB	69.2	192
25	15	05CLC02564CTB	83.1	231
30	17	05CLC03064CTB	92.3	257

(All dimensions in inches and weights in lbs. Do not use for construction purposes.)

PLEASE NOTE:
- Order motors separately.
- For intermediate horsepower pumps consult factory.
- Solid line is recommended operating range. The dotted line (– – –) signifies an alternate pump selection is available.
- Please specify all options changes in W.E. order number.



MATERIALS OF CONSTRUCTION

Part Name	Material
Shaft	ASTM A582 TYPE 416
Coupling	ASTM A582 S41600 CD
Suction Adapter	Ductile Iron ASTM A536
Discharge Bowl	ASTM A48 CL 30B
Bronze Bearings	ASTM B584
Discharge Bowl Bearing	ASTM B584
Taperlocks	ASTM A108 GR 101B
Bowl	ASTM A48 CL 30B
Upthrust Collar	Polyethylene
Impeller	ASTM B584
Fasteners	SAEJ429 GR 8
Cable Guard	ASTM A240 S 30400
Suction Strainer	ASTM A240 S 30400

KELLER associates

☐ Meridian Office (208) 288-1992
☐ Pocatello Office (208) 238-2146
☐ Idaho Falls Office (208) 542-6120
☐ Salem Office (503) 364-2002

Project Name: McCammon Bitton Well
Calculated By: M. Fildin Date: 3/19/13
Project No: 212081 Sheet: ____ of ____

ESTIMATE PUMP PERFORMANCE

OBSERVED 130 gpm @ 83 psi SYSTEM PRESSURE

ESTIMATE DRAWDOWN

FROM THE PUMP TEST: 191.5 ft drawdown / 206 gpm = 0.93 ft/gpm

@ 130 gpm : (0.93 ft/gpm)(130 gpm) = 121 feet

STATIC WATER LEVEL = 63 feet.

ESTIMATE TOTAL DYNAMIC HEAD:

STATIC WATER LEVEL = 63 feet

DRAWDOWN = 121 feet

SYSTEM PRESSURE 83 psi = 192 feet

ESTIMATE PIPING LOSSES = 10 feet

TOTAL = 386 feet.

THE PUMP SHOULD MAKE 160 gpm @ 386 feet OR 500 FEET AT 130 gpm. IT APPEARS PUMP CAPACITY HAS DROPPED ABOUT 20% POSSIBLY DUE TO WEAR FROM PUMPING SAND.

LIQUID ENGINEERING CORPORATION

October 14, 2019

City of McCammon
Box 9
McCammon, ID 53732

Ref: Job # 53732

Dear Mr. Rich Pierson:

As a new service provided to our loyal customers, we are reviewing all our previous inspections. Part of this review will include providing you with a summary report detailing areas of your tank that are in need of maintenance as dictated by EPA, OSHA, AWWA, NFPA, and general recommendations. For ease of understanding, we have organized the report into categories:

Safety & Health (OSHA/EPA)
Facilities (AWWA/NFPA)
General Deficiencies and Suggested Maintenance

We appreciate your business and look forward to handling your tank maintenance.

Sincerely,

Liquid Engineering Corporation
LaRae Hurt
Project Manager
406-869-3148 – Direct
406-651-0120 – Fax
lhurt@liquidengineering.com

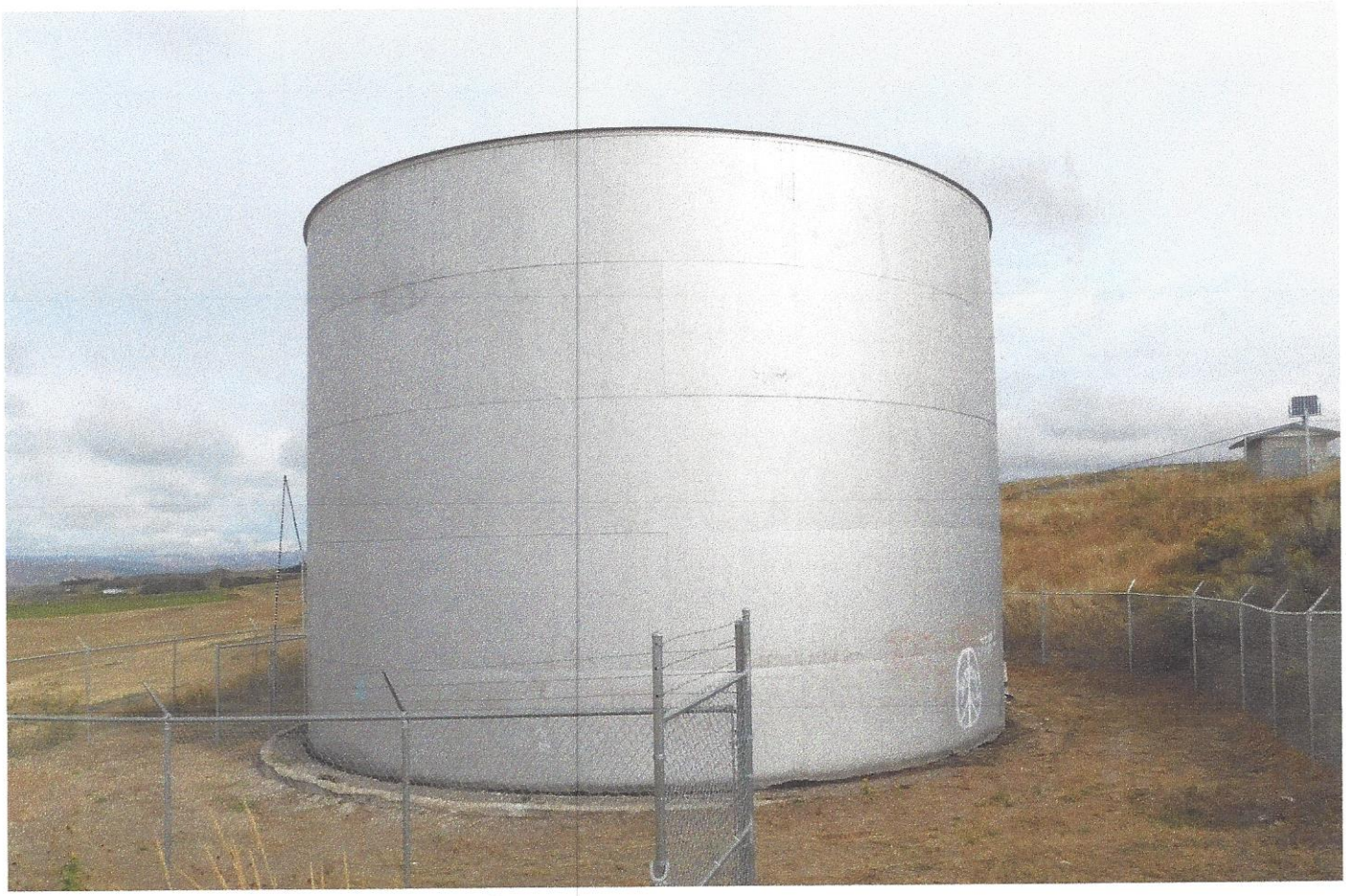
LIQUID ENGINEERING CORPORATION

Summary Report

City of McCammon
Tank 1
Liquid Engineering Corporation Job #53732

Tank Name:	Tank 1	Tank Type:	On Grade
City:	McCammon	Tank Capacity:	300,000
State:	ID	Type of Construction:	Welded Steel
Year Built:	Not Provided		
Inspected By:	**Jacob Groth**		
Inspection Date:	**September 30, 2019**		

This report is a supplement to the visual and video inspection undertaken for the City of McCammon, McCammon, ID, by Liquid Engineering Corporation of Billings, MT. Tank 1 is an on grade water storage tank. The tank has a 300,000 gallon capacity, with an approximate height of 30' and an overall diameter of approximately 41'.



7 East Airport Road • P.O. Box 80230 Billings, MT 59108-0230 • 800-438-2187 • Fax: 406-651-0120
web@liquidengineering.com • www.liquidengineering.com

SUMMARY

Safety & Health (OSHA & EPA)

- We recommend electrically grounding the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780-2017; 5.4 Metal Towers and Tanks. (See photo 4)

- We recommend installing a davit arm on the primary shell manway, installing a 30" secondary shell manway 180° from the primary manway, posting **Confined Space Entry** signs, and installing maintenance free galvanized steel bolts to adhere with AWWA D100-11; 7.4.4 Shell manholes, NFPA 22-2018; 14.7.2.1.1 and OSHA 1910.146(c)(2) Confined spaces. (See photo 6)

- OSHA 1910.23(b)(4) states, "Ladder rungs, steps, and cleats have a minimum clear width of… 16 inches (41 cm) (measured before installation of ladder safety systems) for fixed ladders,… " We recommend installing anti-skid rung covers, a cable type ladder safety device, and posting a **Fall Protection Required** sign. (See photo 8)

- OSHA 1910.28(b)(1)(i) states, "...the employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4 feet (1.2 m) or more above a lower level is protected from falling by one or more of the following: 1910.28(b)(1)(i)(A) Guardrail systems." OSHA 1910.29(b)(1) states, "The top edge height of top rails, or equivalent guardrail system members, are 42 inches (107 cm), plus or minus 3 inches (8 cm), above the walking-working surface." OSHA 1910.29(b)(2)(i) states, "Midrails are installed at a height midway between the top edge of the guardrail system and the walking-working surface;…" OSHA 1910.29(k)(1) states, "The employers must ensure toeboards used for falling object protection:..." We recommend installing an OSHA compliant 42" high handrail system around the circumference of the tank roof, complete with an intermediate rail, a toeboard, and a swing gate at the junction of the shell-to-roof access ladder and tank roof. (See photo 10)

- We recommend installing a 30" secondary hatch 180° from the primary roof hatch, posting **Confined Space Entry** signs, and installing a lock on the primary hatch to adhere with AWWA D100-11; 7.4.3 Roof openings and OSHA 1910.146(c)(2) Confined spaces. We further recommend installing an OSHA compliant interior access ladder complete with standoffs every 10' on center, and a cable type ladder safety device at the suggested secondary roof hatch. **In cold climates it's up to the owner's discretion on placement of internal ladders.* (See photo 11)

- OSHA 1910.23(b)(4) states, "Ladder rungs, steps, and cleats have a minimum clear width of… 16 inches (41 cm) (measured before installation of ladder safety systems) for fixed ladders,… " We recommend installing anti-skid rung covers and a cable type ladder safety device on the primary interior access ladder. (See photo 12)

Facilities (AWWA & NFPA)

- We recommend posting a **No Trespassing** sign and a **Warning, Tampering With This Facility is a Federal Offense** (US code title 42, section 300i-1) sign on the fence. (See photo 1)

- AWWA D100-11; 12.7.1 Height aboveground states, "The tops of the concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified." We recommend clearing any dirt, debris and other loose gravel away from the concrete ring, down to a minimum 6" below top of the concrete ring. This should be done by a local excavating company. (See photo 2)

- AWWA D100-11; 7.3 Overflow states, "An internal overflow is defined as an overflow with piping inside the tank container. The consequences of an overflow failure, which can empty the tank contents, shall be considered when an internal overflow is provided." NFPA 22-2018; 14.6.3 states, "Where dripping water or a small accumulation of ice is not objectionable...The pipe shall be extended with a slight downward pitch to discharge beyond the tank or balcony and away from the ladders and shall be adequately supported." TSS; 7.0.7 Overflow states, "No overflow may be connected directly to a sewer or a storm drain." We recommend replacing the internal overflow system with a properly sized exterior overflow system, complete with a weir box on the interior, standoffs every 10' on center extended to grade, an elbow fitted with a flapper valve and screen to prevent the ingress of contaminants into the water supply. (See photo 7)

- NFPA 25-2017; 9.3.1* states, "Level indicators shall be tested every 5 years for accuracy and freedom of movement." NFPA 22-2018; 14.1.8* Water-Level Gauge states, "A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained." Due to the condition of the indicator, we recommend replacing the liquid level indicator with a float-type liquid level indicator. (See photo 9)

- AWWA D100-11; 7.5 states, "When the vent is provided with screening against insects, a pressure-vacuum-screened vent or a separate pressure-vacuum relief mechanism shall be provided that will operate in the event that the screens frost over or become clogged." NFPA 22-2018; 4.15.5 states, "The screen or perforated plate shall be protected against the accumulation of sleet." We recommend replacing the existing roof vent with a vacuum-pressure, frost proof vent and screen. **This work should be performed on an emergency basis.** (See photo 13)

General Deficiencies and Suggested Maintenance

- We recommend repairing any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking/grouting around the base of the tank to foundation connection to prevent water from entering under the tank, then sealing the concrete with a sealant. (See photo 3)

- We recommend installing a frost proof drain valve near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank. (See photo 5)

- We recommend pressure washing the tank exterior with biodegradable detergent injection (minimum 3,500 psi at 3.0 gpm) then removing all loose rust and scale with wire brushes and hand scrapers in accordance with SSPC#2 (hand tool cleaning), spot priming and applying one (1) finish coat of acrylic paint. (See photo 14)

- We recommend disconnecting the support column baseplate from the floor and installing guides on the sides of the plate to ensure it stays in place. We further recommend reinforcing the baseplate with equally spaced 1/2" gussets. (See photo 15)

- We recommend installing a mixing system. Electrical work to be done by others if required. (See photo 16)

- We recommend performing a robotic in-service interior cleanout in order to prevent contamination issues associated with excessive sediment buildup. **This work should be performed on an emergency basis.** **Please note price for interior cleanout is based on removing 1" – 3" of sediment. Any additional accumulation discovered will be removed in the amount of $300 per hour. In the event the tank has to be drained, tank will need to be drained by the owner, prior to our arrival.* We further recommend installing a passive cathodic protection system. (See photo 17)

- We recommend re-evaluating the tank interior to determine the condition of the interior coating system at your next scheduled inspection. (See photo 18)

APPENDIX A

Photographs

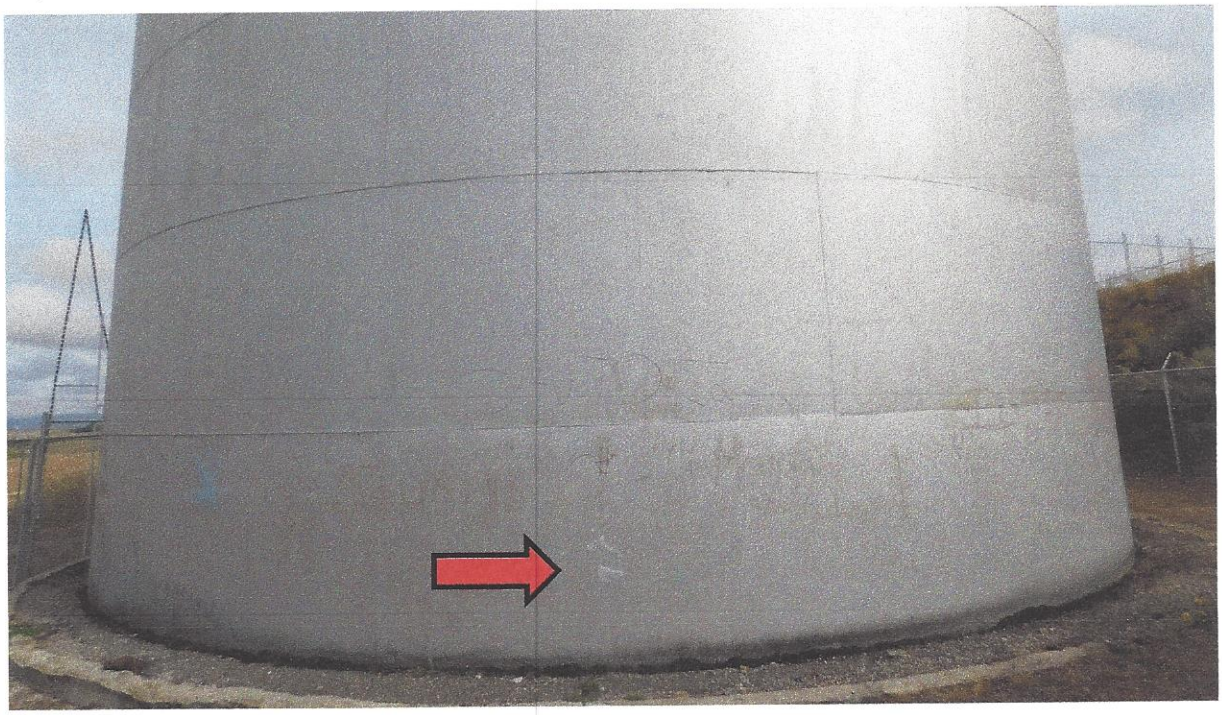
1.) Fence

2.) Concrete Ring

3.) Unsealed Concrete

4.) Lack of Electrical Grounding

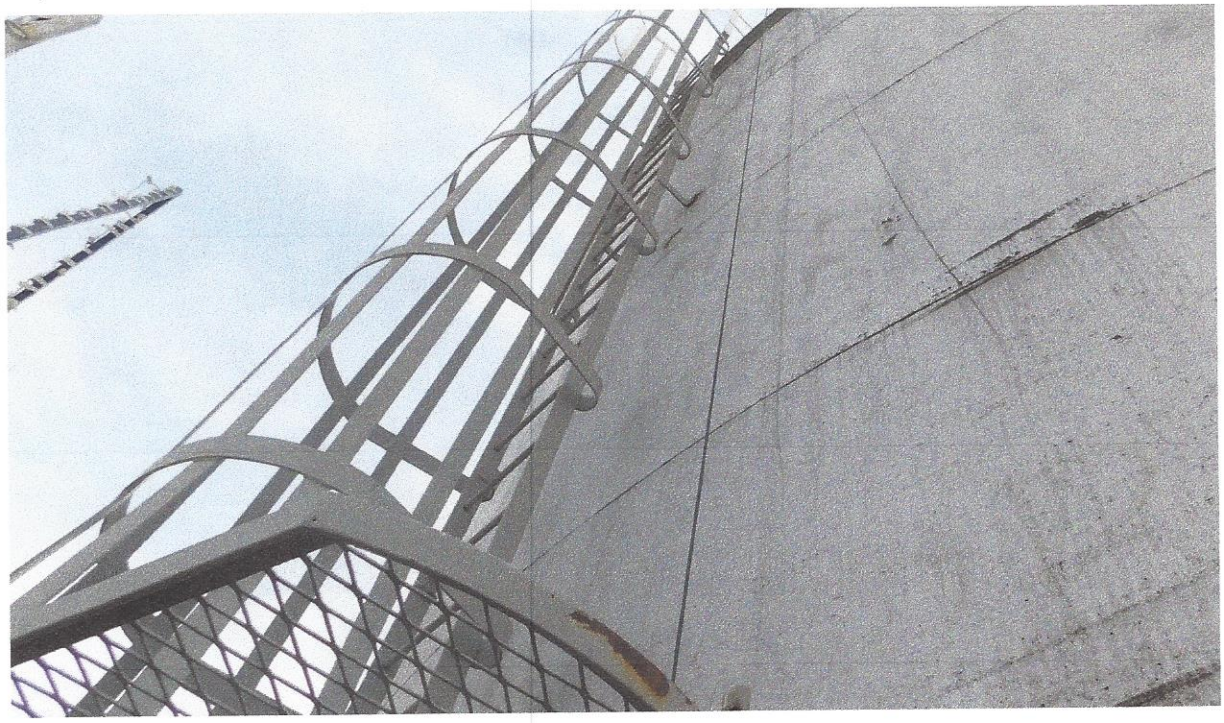
5.) Lack of Drain Valve



6.) Primary Shell Manway

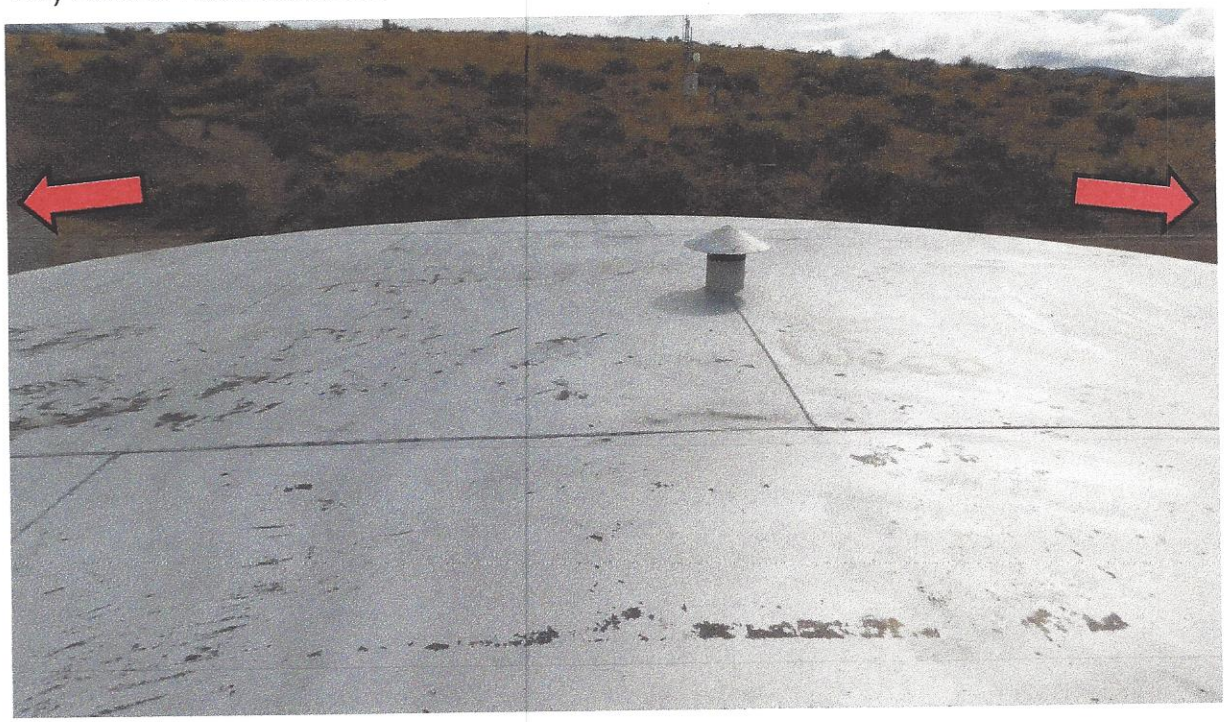
7.) Overflow

8.) Shell Access Ladder



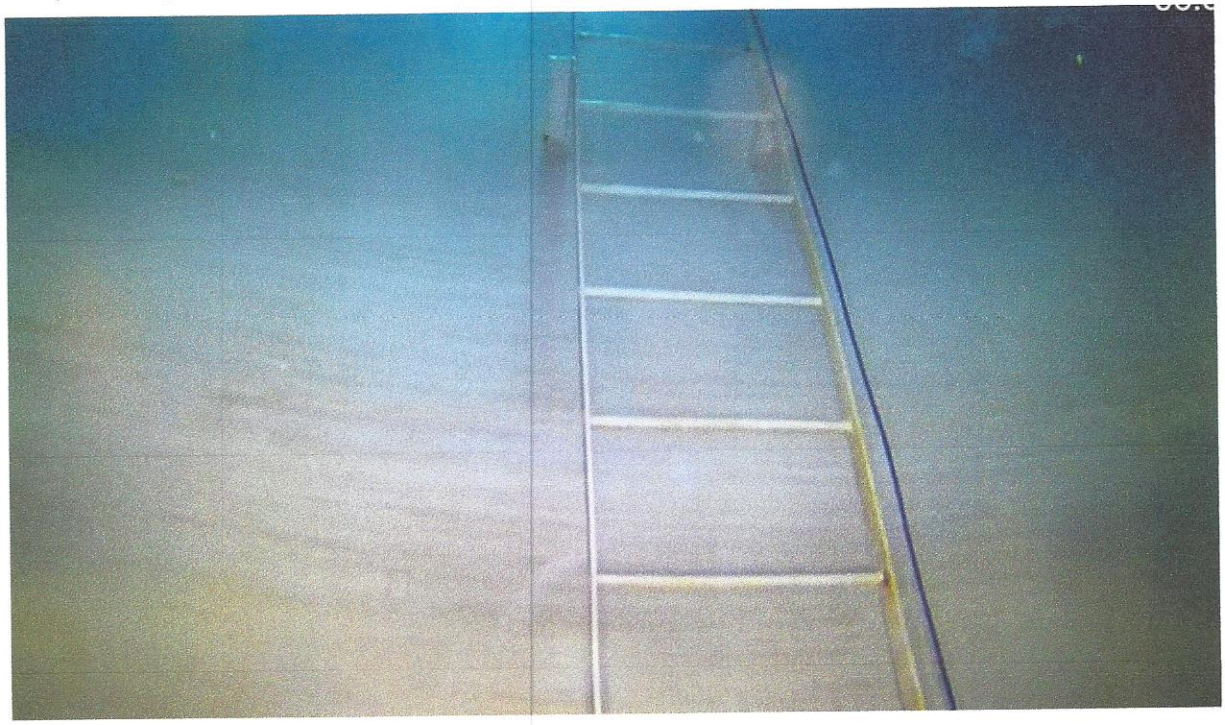
9.) Liquid Level Indicator

10.) Lack of Roof Handrails



11.) Primary Roof Hatch

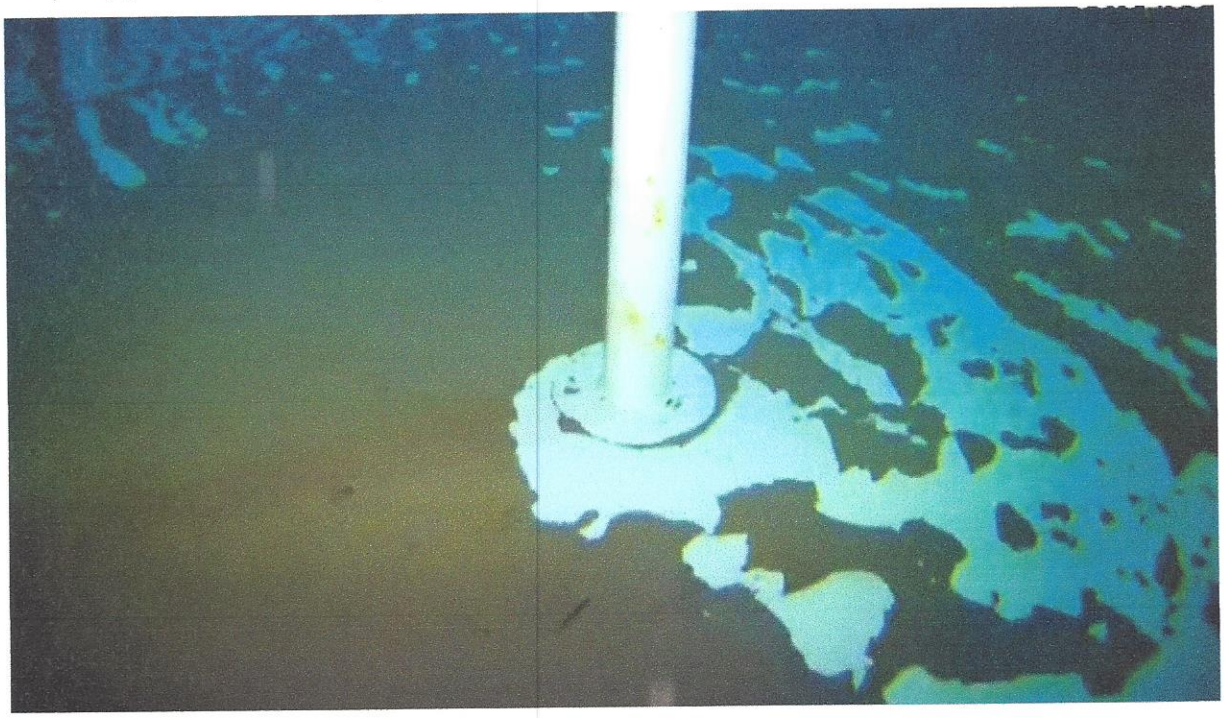
12.) Primary Interior Access Ladder



13.) Roof Vent

14.) Exterior Coating System

15.) Support Column Baseplate



16.) Lack of Mixing System

17.) Sediment

18.) Interior Coating System

13.04.380 Penalty. It is unlawful and a misdemeanor for any person to violate or use water outside for any purpose except fire suppression when prohibited by a restricted water resolution and each day or period of unlawful use shall constitute a separate offense. (Ord. 276 §1(part), 1993)

Chapter 13.08

CROSS-CONNECTIONS TO WATER SYSTEM

Sections:

13.08.010 Purpose of provisions. The purpose of this chapter is to protect the public health of water consumers of the city, by the control of actual and/or potential cross-connections. (Ord. 238 §1, 1980)

13.08.020 Definitions. For the purposes of this chapter the following words shall have the meaning set forth in this section:

A. "Backflow" means the flow other than the intended direction of flow, of any foreign liquids, gases or substances into the distribution system of the city water supply.

B. "City" means the city of McCammon and its designated representatives.

C. "Contamination" means the entry into or presence in a city water supply of any substance which may be deleterious to health and/or quality of the water.

D. "Cross-connection" means any physical arrangement whereby the city water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, or other device which contains or may contain contaminated water, sewage or other waste or liquids of unknown or unsafe quality which may be capable of imparting contamination to the city water supply as a result of backflow. (Ord. 238 §2, 1980)

13.08.030 Cross-connection restrictions. No water service connection to any premises shall be installed or contained in the city unless the water supply is protected against cross-connections as required by this chapter. The installation or maintenance of a cross-connection which will endanger the water quality of the potable water supply of the city, shall be unlawful and is prohibited. Any such cross-connection now existing or hereafter installed is declared to be a public nuisance and the same shall be abated. The control or elimination of cross-connections shall be in accordance with this chapter, Idaho Code, and all standards, rules and regulations of the state, the Idaho Department of Health and Welfare, and any other federal, state, county or city authority or agency thereof, together with the latest addition of appropriate manuals of standard practice pertaining to cross-connection control enacted by the city and any applicable county, state and federal authorities and

agencies. The city shall have the authority to establish requirements more stringent than state regulations if it deems that the conditions so dictate. (Ord. 238 §3, 1980)

13.08.040 Backflow prevention device. A. Backflow prevention devices shall be installed in connection with water service connections or within any premises where, in the judgment of the city, the nature and extent of the activities, or the materials stored on the premises, would present an immediate and dangerous hazard to health and/or be deleterious to the quality of the water should a cross-connection occur; even though such cross-connection does not exist at the time the backflow prevention devices shall be installed under circumstances including but not limited to the following:

1. Premises having an auxiliary water supply, unless the quality of the auxiliary supply is in compliance with Idaho Code, and all standards, rules and regulations of the state, the Idaho Department of Health and Welfare, and any other federal, state, county or city authority or agency thereof and is acceptable to the city;

2. Premises having internal cross-connections that are not correctable, or intricate plumbing arrangements which make it impracticable to ascertain whether or not cross-connections exist;

3. Premises where entry is restricted so that inspections for cross-connections cannot be made with sufficient frequency or at sufficiently short notice to ensure that cross-connections do not exist;

4. Premises having a repeated history of cross-connections being established or reestablished;

5. Premises on which any substance is handled under pressure so as to permit entry into the city water supply or where a cross-connection could reasonably be expected to occur. This shall include the handling of process waters and cooling waters;

6. Premises where materials of a toxic or hazardous nature are handled in such a way that if back siphonage should occur, a serious health hazard might result;

7. The following types of facilities will fall into one of the above categories where a backflow prevention device is required to protect the city water supply. A backflow prevention device shall be installed at these facilities unless the city and applicable state, county and federal authorities and agencies determine that no hazard exists:

a. Hospitals, mortuaries, clinics,
b. Laboratories, including school laboratories,
c. Metal plating industries,
d. Sewage treatment plants,
e. Food or beverage processing plants,
f. Chemical plants using a water process,

g. Petroleum processing or storage plants,
h. Car washes,
i. Dry cleaners,
j. Other premises as specified by the city,

where backflow prevention devices are required to protect the city water supply.

B. The type of protective device required shall depend on the degree of hazard which exists:

1. An air-gap separation or a reduced pressure principle backflow prevention device shall be installed where the city water supply may be contaminated with sewage, industrial waste of a toxic nature or other contaminant which could cause a health or system hazard.

2. In the case of a substance which may be objectionable but not hazardous to health, a double check valve assembly, air gap separation or a reduced pressure principle backflow prevention device shall be installed.

C. Backflow prevention devices required by this ordinance shall be installed at the meter, at the property line of the premises when meters are not used, or at a location designated by the city. The device shall be located so as to be readily accessible for maintenance and testing, and furthermore, where no part of the device will be submerged.

D. Backflow prevention devices required by this chapter shall be installed under the supervision of, and with the approval of, the city.

E. Any protective device required by this chapter shall be approved by the city, applicable state, county and federal authorities and agencies. These devices shall be furnished and installed by and at the expense of the customer.

F. Backflow prevention devices installed pursuant to this chapter except atmospheric vacuum breakers, shall be inspected and tested annually, or more often if necessary. Inspections, tests and maintenance shall be at the customer's expense. Whenever the devices are found to be defective, they shall be repaired, overhauled or replaced at the customer's expense. Inspections, tests, repairs and records thereof shall be accomplished under the city's supervision by certified testers, retained and pair by the customer.

G. No underground sprinkling device will be installed without adequate backflow prevention devices at the point from which the water for irrigation is taken from the city water supply.

H. Failure of the customer to cooperate in the installation, maintenance, testing or inspection of backflow prevention devices required by this chapter, Idaho Code and all standards, rules and regulations of the state, the Idaho Department of Health and Welfare, and any other federal, state, county or city authority or agency thereof shall be grounds for the termination of water service to the

premises, or, in the alternative, the installation of any air-gap separation at the customer's expense. (Ord. 238 §4, 1980)

13.08.050 Cross-connection inspection. A. No water shall be delivered to any structure hereafter built within the city or within areas served by city water until the same shall have been inspected by the city for possible cross-connection and been approved as being free of the same.

B. Any construction for industrial or other purposes which is classified as hazardous facilities pursuant to Section 13.08.040 (A)(7), where it is reasonable to anticipate cross-connections, or as determined by the city, shall be protected by the installation of one or more backflow prevention devices at the point of service from the city water supply or any other location designated by the city, and applicable county, state, and federal authorities and agencies.

C. Inspections may be made periodically of all buildings, structures, or improvements of any nature now receiving water through the city's system for the purpose of ascertaining whether cross-connections exist. Such inspections shall be made by the city or applicable county, state and federal authorities and agencies.

D. Since the city does not at the present time have any devices which need testing, does agree that at such time as the city does have a need for this program, they will enter into the testing program. (Ord. 238 §5, 1980)

13.08.060 Cross-connection control device--Installation permit. If cross-connection control device(s) are found to be necessary, the owner of the property served must apply to the city for a specific installation permit. No cross-connection control device may be installed, removed or relocated without a permit to do so. (Ord. 238 §6, 1980)

13.08.070 Additional remedies--Nuisance declared. In the event an improper cross-connection is not connected within the time limits set by the city or in the event the city is refused access to any property for the purpose of determining whether or not cross-connections exist, the city may cease delivery of water to the property until the deficiency is corrected to the city's satisfaction. In addition, the city without waiving any terms of this chapter may, but shall not be required to, effect the necessary repairs or installations at the expense of the property owner and refuse delivery of water to the property until the cost thereof shall have been paid. Violations of this chapter are declared to be a nuisance and the city, after notice to the customer or property owner to remove or correct the violation, may prevent, remove and abate the same at the expense of the party creating or maintaining the same, in

which event the city may levy a special assessment as provided in Idaho Code 50-1008 on the land or premises whereon the nuisance is situated to defray the cost or to reimburse the city for the cost of abating the same. (Ord. 238 § 7, 1980)

13.08.080 Liability disclaimer. This chapter shall not be construed to hold the city responsible for any damage to persons or property by reason of the inspection or testing in this chapter, or the failure to inspect or test or by reason of approval of any cross-connections. (Ord. 238 § 10, 1980)

13.08.090 Civil action. In addition to, or in lieu of the foregoing, the city may bring any appropriate civil action, including abatement, injunction, and/or damages in which event the city shall be entitled to all costs including attorney's fees in the prosecution of such action. (Ord. 238 § 8, 1980)

13.08.100 Violation--Penalty. In addition to the foregoing, any person violating the provisions of this chapter shall be deemed guilty of a misdemeanor and upon conviction thereof shall be subject to the penalties as provided by law. (Ord. 238 § 9, 1980)

Chapter 13.12

SEWER SYSTEM

Sections:

Well #1

Well #1 is located in a well house at 2nd West and 12th. It was drilled in 1978 but had been out of service to the city for a number of years. The well was rehabilitated and placed back into service in 2007. The well is 600 feet deep with a12-inch casing to 498 feet. It is sealed with cement grout to 38 feet. At the time it was drilled, the static water level was 104 feet. It is equipped with a 20 hp submersible pump. The discharge line has a flow meter, pressure gauge, check valve, isolation valves and sample tap. The well house is heated, lighted and has a floor drain. The well can be pumped to waste with the water going to the nearby irrigation canal. This well is manually controlled.

Well #3 (Bitton Well)

This well is located outside the pump house on a well lot on Cemetery Road across from the LDS church. This well was originally drilled in 2000, but was rehabilitated in 2013 due to pumping sand. The well is now 510 feet deep and cased to 403 feet. The static water level at the time it was rehabilitated was 63 feet. The discharge line in the pump house has isolation valves, check valve, flow meter, pressure gauge, sample tap and pump to waste piping. As the well is brought on and off-line, water and air are discharged from a down turned vent into the pump house drainage sump. An additional pipe discharges overflow through the wall of the pump house. The building has a drain that runs to a sump on the well lot.

The City also owns two other wells. Well #2 is located in the city park at Center and 7th Street and is currently not in use. A fourth well was drilled for the City near the entrance to town but it has never been fully developed. These wells should be properly abandoned.

Storage

The 300,000 gallon steel storage reservoir is located just east of town on the hillside. The above ground steel storage reservoir was constructed in 1953. The reservoir is vented and accessed by a steel safety ladder to the hatch on top. A weight and bucket hang from a cable on the exterior of the tank to mark the water level. The weight is connected to a float on the inside of the reservoir to indicate the level of water in the tank. A vault adjacent to the reservoir contains valves which control the flow to the tank, the distribution system, and the overflow.

Treatment

The chlorination system is housed in a building just above the storage reservoir. A 12.5% Liquichlor sodium hypochlorite solution is injected into the line from the spring prior to it entering the reservoir. The Pulstron chlorine injector is not flow proportioned. The chlorine building is showing signs of deterioration from the chlorine due to lack of ventilation. There was a strong smell of mouse excrement in the building and a mouse was seen running across the floor when the door was opened. It is unclear as to whether the use of disinfection is voluntary or required. Chlorine residuals are checked once per week. An underground vault next to this building contains a valve and flow meter from the spring.

Distribution System

The distribution piping ranges from 2-inch to 8-inch and is PVC, ductile iron, cast iron or steel. Residences are connected to the distribution piping by ¾-inch steel or copper lines. The services not metered. There are fire hydrants connected to lines smaller than six inches in diameter.

Monitoring/Reporting/Data Verification

Currently, the water system is in compliance with all chemical and bacteriological monitoring and reporting requirements.

Pumps/Pumping Facilities and Controls

Both wells are equipped with 20 hp submersible pumps. The water system does not have a SCADA system so the wells must be manually controlled. There is also no auxiliary power on the system. Modifications would need to be made to accommodate an emergency generator. No booster pumps are used to transport water through the system.

Management/Operator Compliance

The City of McCammon water system is under the direction of a Mayor and 4 council members. Rich Pierson is serving as the Responsible in Charge (RIC) Operator and the Substitute Responsible Charge Operator. He is certified as a Drinking Water Distribution 1(DWD1) operator. The water system charges $38.00 per month to the water users.

Groundwater Under the Direct Influence of Surface Water (GWUDI)

A final GWUDI determination was made for Crystal Springs on December 26, 2002. Two microscopic particulate analysis (MPA's) were conducted on the springs. Based on DEQ's determination, at this time, the spring has been determined to be **groundwater** that is not under the direct influence of surface water. Both wells are also considered to be groundwater. Well #1 underwent a hydro-geological evaluation due to its distance from a nearby irrigation canal as part of the determination.

You will find a list of the significant deficiencies, deficiencies and recommendations for your system summarized below.

A **Significant Deficiency** is defined in IDAPA 58.01.08.003.88. that states: As identified during a sanitary survey, any defect in a system's design, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the Department determines to cause, of have the potential to cause, risk to health and safety, or that could affect the reliable delivery of safe drinking water.

A **Deficiency** states: As identified during a sanitary survey, the systems design, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the Department determines are not in compliance with the drinking water rules and do not cause or do not have the potential to cause, risk to health or safety, or that could not affect the reliable delivery of safe drinking water.

Recommendations are made as an item to consider in order to improve the overall operation of the water system.

Significant Deficiencies

No significant deficiencies were identified.

Deficiencies

No Substitute Responsible Charge Operator (OP): As long as the Responsible Charge Operator (DO) is available 24/7, an OP is not required. At such time the DO is not available, an OP will be designated to take over the PWS responsibilities, as required by IDAPA 58.01.08.554.03.

(Rich Pierson is serving as both the DO and the OP.)

Sources

The area within 100 feet of the spring box is fenced to prevent trespass of livestock but not protected from sources of contamination, as required by IDAPA 58.01.08.514.05.

(At the time of the inspection there was a car parked inside the collection area due to the lack of a lock on the gate. The City should put a lock on the gate to prevent potential contamination.)

The spring box is not protected from contamination including the entry of surface water and/or dust as required by IDAPA 58.01.08.514.01.

(The gasket on the inside of the lid needs replaced.)

Adequate ventilation is not provided in pump house #1 and #3 for dissipation of excess heat and moisture from the equipment, as required by IDAPA 58.01.08.541.01.e. At the time of the inspection there was no evidence of corrosion of metallic and/or electrical components from excessive heat and/or moisture. The requirement of ventilation will be reevaluated every time an ESS is conducted. **(No action required at this time)**

There is no auxiliary power on-site for well #1, well #3, or the chlorinator as required by IDAPA 58.01.08.501.07. According to the operator, the power outages experienced by the system are of minimal frequency and duration that auxiliary power will not be required. The need for auxiliary power on-site will be reevaluated every time an ESS is conducted. **(No action required at this time)**

(The water system is able to supply pressure to the system in the event of a power outage through the spring water and the storage reservoir. The City should be planning for the addition of emergency power on at least one of the wells.)

Distribution

There are fire hydrants provided that are connected to water mains smaller than six (6) inches in diameter, which is not in accordance with IDAPA 58.01.08.542.06.

(This deficiency has been noted in the 2005, 2010 and now 2015 sanitary survey. The City should be working towards replacement of those lines.)

There is no cross connection control program for the PWS, as required by IDAPA 58.01.08.552.06.

(This deficiency was noted in 2005, 2010 and now the 2015 sanitary survey and needs to be addressed. The City needs to have an enforceable cross connection control program and ordinance.)

Storage

The overflow pipe for the storage reservoir and springs are not provided with an expanded metal screen installed within the pipe to exclude rodents and deter vandalism, as required by IDAPA 58.01.08.544.06 and 58.01.08.501.09.01.

Treatment

A smooth nosed sample tap is not provided before and after treatment, as required by IDAPA 58.01.08.501.09.

(The tap after treatment is currently the first connection.)

Adequate ventilation is not provided in the chlorinator building for dissipation of excess heat and moisture from the equipment and the smell of mouse excrement, as required by IDAPA 58.01.08.541.01.e. At the time of the inspection there was evidence of corrosion of metallic and/or electrical components from excessive heat and/or moisture.

An automatic proportioning chlorinator is not being used where the rate of flow is not reasonably constant, as required by IDAPA 58.01.08.552.04.a.iii.

(DEQ recommends the free chlorine residual be measured daily to detect variations in the chlorine levels.)

Managerial

An operation and maintenance manual is not provided for the PWS, having daily operating instructions and/or operator safety procedures and/or location of valves and other key system features and/or parts list and parts order form and/or information for contacting the water system operator, as required by IDAPA 58.01.08.501.12.

(This deficiency was noted in the 2010 sanitary survey)

The Public Water System has water supply wells that are no longer being used that need to be abandoned, as required by IDAPA 58.01.08.510.09. Any water supply well that will no longer be used must be abandoned by sealing the borehole carefully to prevent pollution of the ground water, eliminate any physical hazard, conserve aquifer yield, maintain confined head conditions in artesian wells, and prevent mixing of waters from different aquifers. The objective of proper well abandonment procedures is to restore, as far as possible, the original hydrogeologic conditions. The services of a licensed well driller are required. Instructions for abandoning various types of wells may be obtained from the Idaho

Department of Water Resources. Rules of the Idaho Water Resources Board are available at www.adm.idaho.gov/adminrules/rules/idapa37/37index.htm

Idaho Department of Water Resources
Idaho Water Center
322 E. Front St.
P.O. Box 83720
Boise, Idaho 83720-0098
Telephone (208) 287-4800.

Recommendations

DEQ recommends that a leak detection program be put in place and utilized.

DEQ recommends the PWS set up a water conservation program.

DEQ recommends that the main lines be flushed annually.

For all modifications to existing water systems, an engineering report shall be submitted to the Department of Environmental Quality's (DEQ) review and approval prior to or concurrent with the submittal of plans and specifications as required in Subsection 504.03, pursuant to IDAPA 58.01.08.503.

Prior to modifications of existing public water supply systems, plans and specifications must be submitted to the DEQ for review, and approved, pursuant to IDAPA 58.01.08.504.03. Please contact this office at 236-6160 prior to making any system modifications.

Thank you for your time and cooperation in the completion of this survey. If you have any questions, please contact me at 236-6160.

Sincerely,

Barbara J. Jones

Barbara J. Jones
Drinking Water Analyst

cc: Tom Hepworth, DEQ Regional Engineering Manager (e-mail)
Rich Pierson, Operator

State of Idaho
Department of Environmental Quality
Photo Log

Name of Facility:		Inspection Date		PWS#
City of McCammon		6/2/2015	(mm/dd/yyyy)	6030038
Camera Type: ☑ Digital ☐ 35mm ☐ Other	Camera Brand: Olympus	Camera Model: SW-770		Camera ID#:

Photo:	Date:	By: (initials)	Direction: (N,S,E,W, etc.)	File Name:	Description:
1	6/2/2015	BJ			Crystal Springs collection area
2	6/2/2015	BJ			Fence around collection area
3	6/2/2015	BJ			Additional fencing
4	6/2/2015	BJ			Spring collection box
5	6/2/2015	BJ			Lid on elevated spring box
6	6/2/2015	BJ			Spring collection box
7	6/2/2015	BJ			Spring manifold box
8	6/2/2015	BJ			Inside spring manifold box
9	6/2/2015	BJ			Spring overflow building
10	6/2/2015	BJ			Inside spring overflow building
11	6/2/2015	BJ			Additional spring overflow
12	6/2/2015	BJ			Chlorinator building
13	6/2/2015	BJ			Piping inside chlorinator building
14	6/2/2015	BJ			Sodium hypochlorite unit
15	6/2/2015	BJ			Liquichlor 12.5% solution
16	6/2/2015	BJ			300,000 gallon storage reservoir
17	6/2/2015	BJ			Vent on top of storage reservoir
18	6/2/2015	BJ			Water level measurement bucket
19	6/2/2015	BJ			Valves inside vault adjacent to storage reservoir
20	6/2/2015	BJ			Overflow/drain pipe for storage reservoir
21	6/2/2015	BJ			Well #1 well house
22	6/2/2015	BJ			Well #1, sample tap
23	6/2/2015	BJ			Pressure gauge
24	6/2/2015	BJ			Flow meter
25	6/2/2015	BJ			Air release on piping, pump to waste piping
26	6/2/2015	BJ			Well #1 pump to waste discharge
27	6/2/2015	BJ			Well #3 (Bitton well) pump house
28	6/2/2015	BJ			Well #3
29	6/2/2015	BJ			Pressure regulator, isolation valves, check valve
30	6/2/2015	BJ			Well #3 flow meter
31	6/2/2015	BJ			Isolation valve on line to distribution
32	6/2/2015	BJ			Pump to waste piping
33	6/2/2015	BJ			Electrical panel for well #3
34	6/2/2015	BJ			Floor drain in pump house

The photographers signature below signifies that the images identified on this photo log have not been tampered with and are representative of what was seen in the field.

Photographer(s) Signature(s): Date:

Photo 1. Crystal Springs collection area


Photo 2. Fence around collection area


Photo 3. Additional fencing

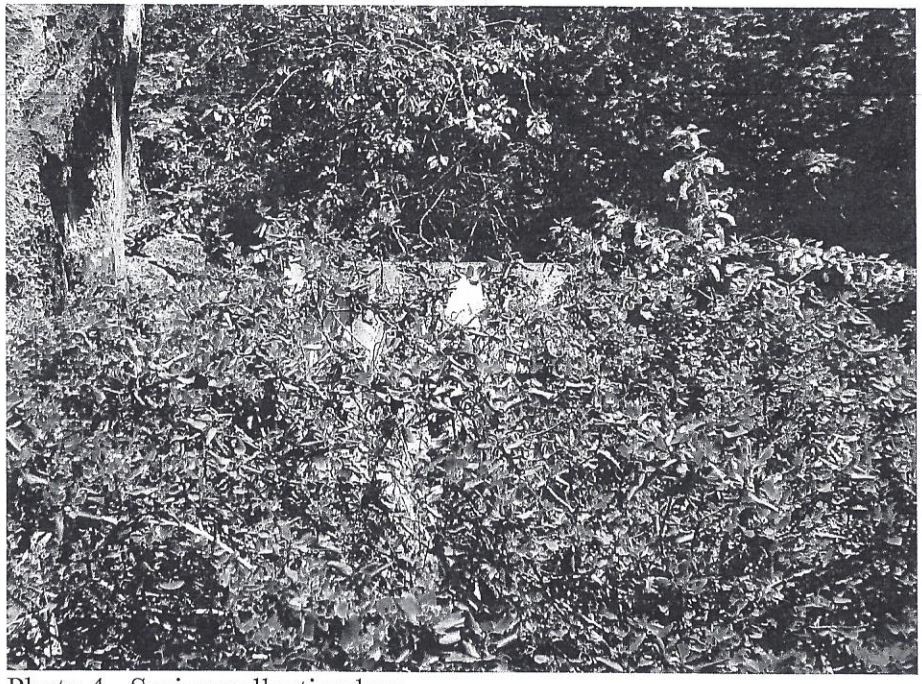


Photo 4. Spring collection box

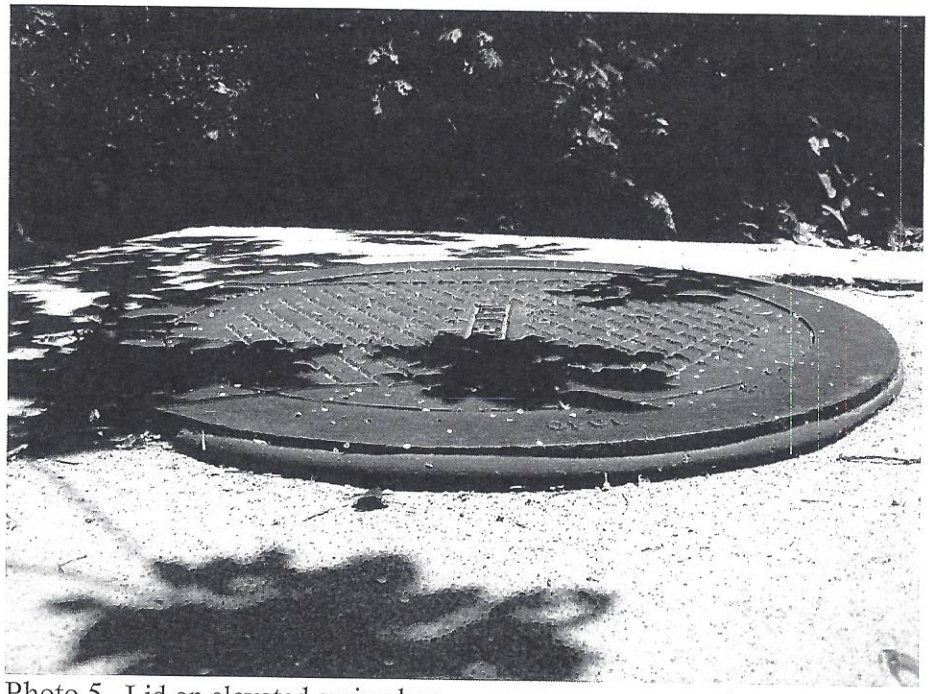


Photo 5. Lid on elevated spring box

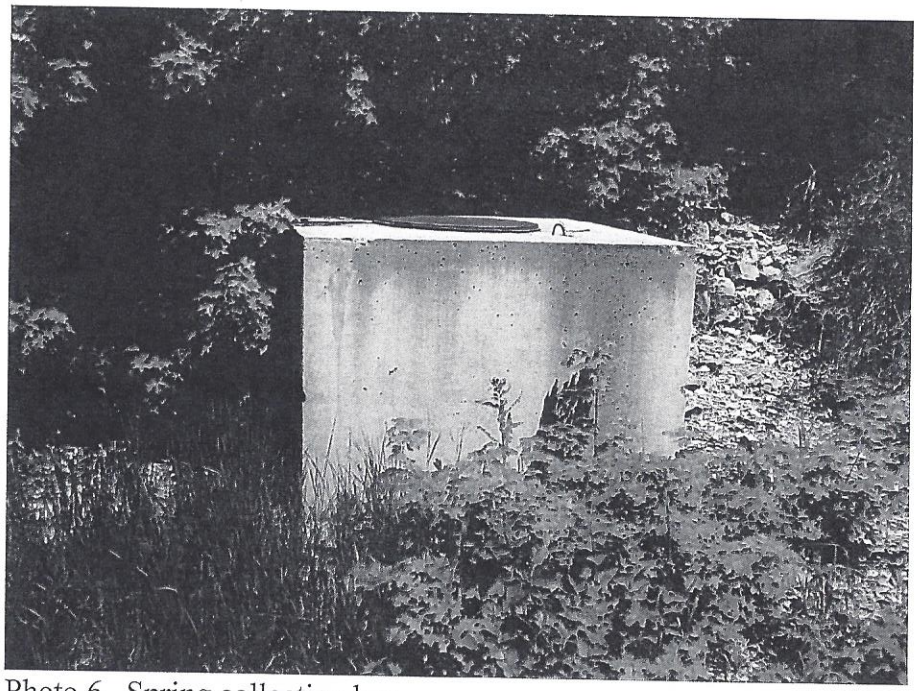


Photo 6. Spring collection box

Photo 7. Spring Manifold box

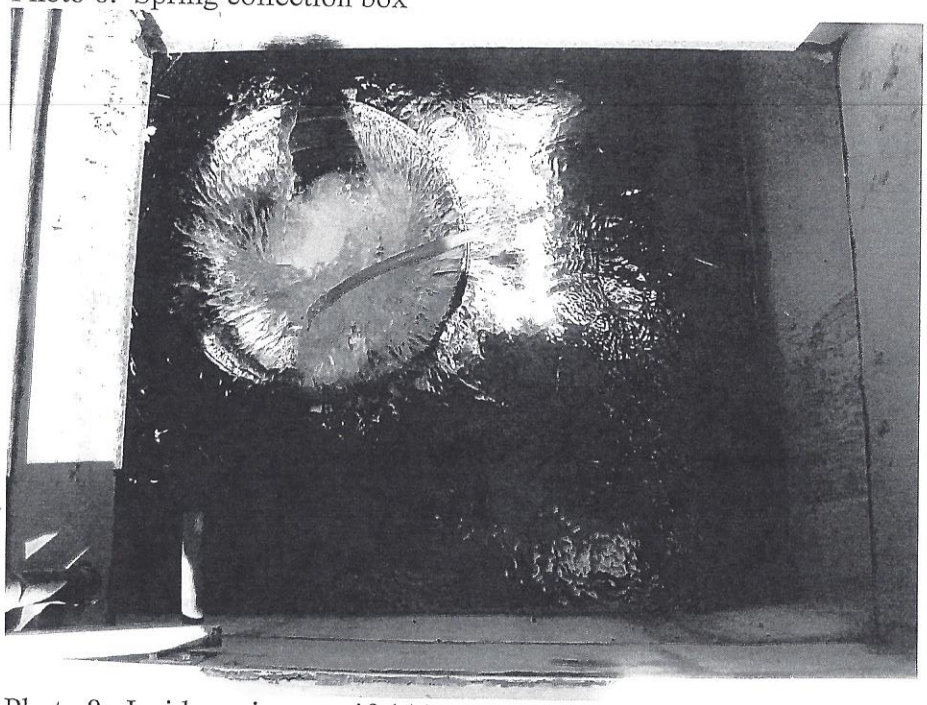


Photo 8. Inside spring manifold box

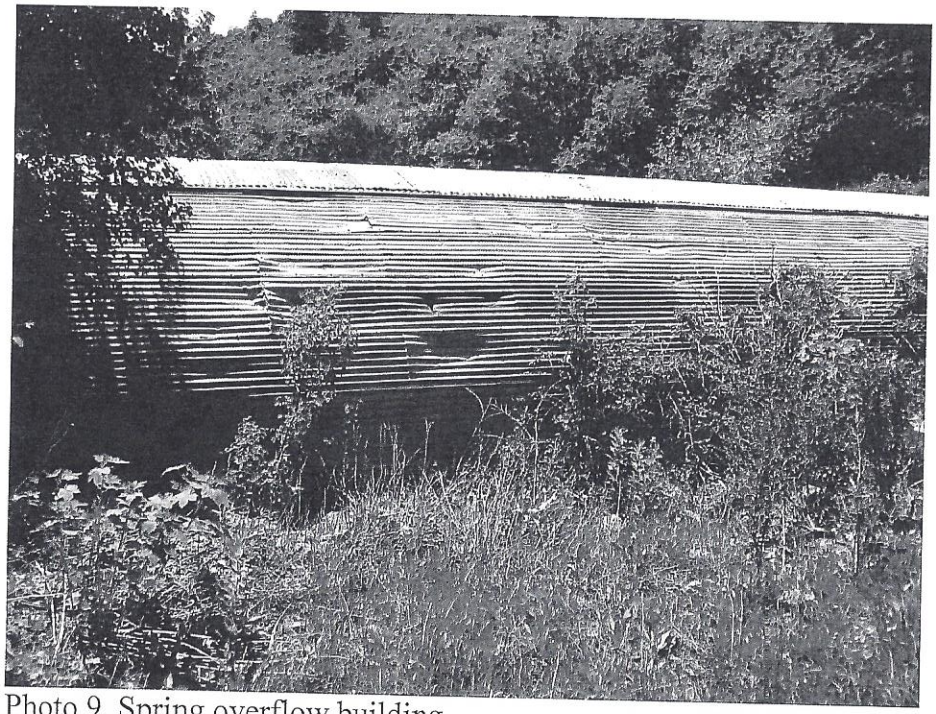


Photo 9. Spring overflow building

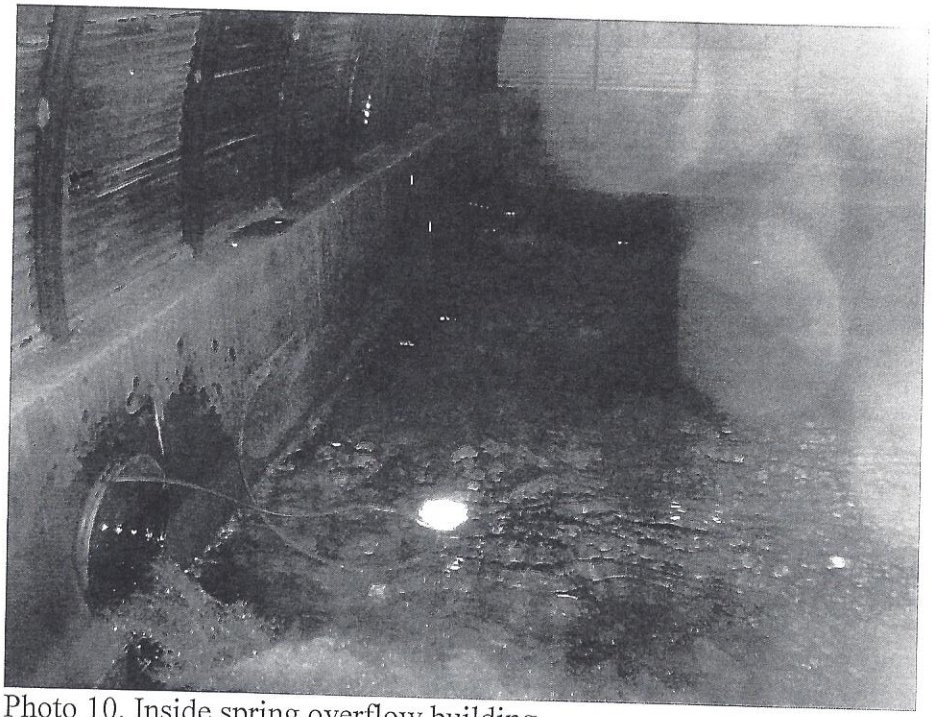


Photo 10. Inside spring overflow building

Photo 11. Additional spring overflow

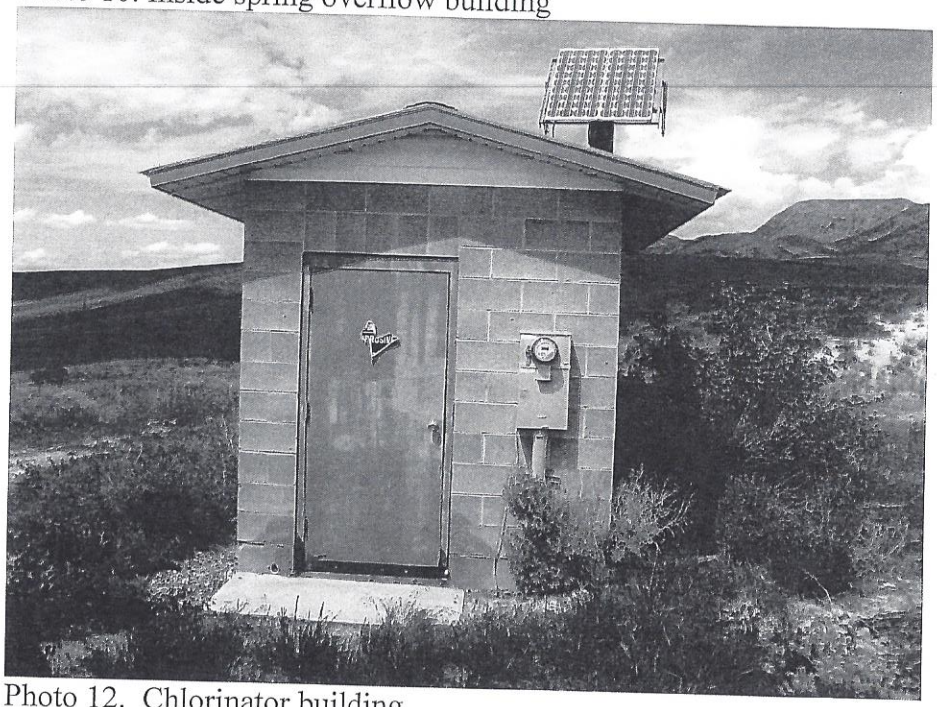


Photo 12. Chlorinator building

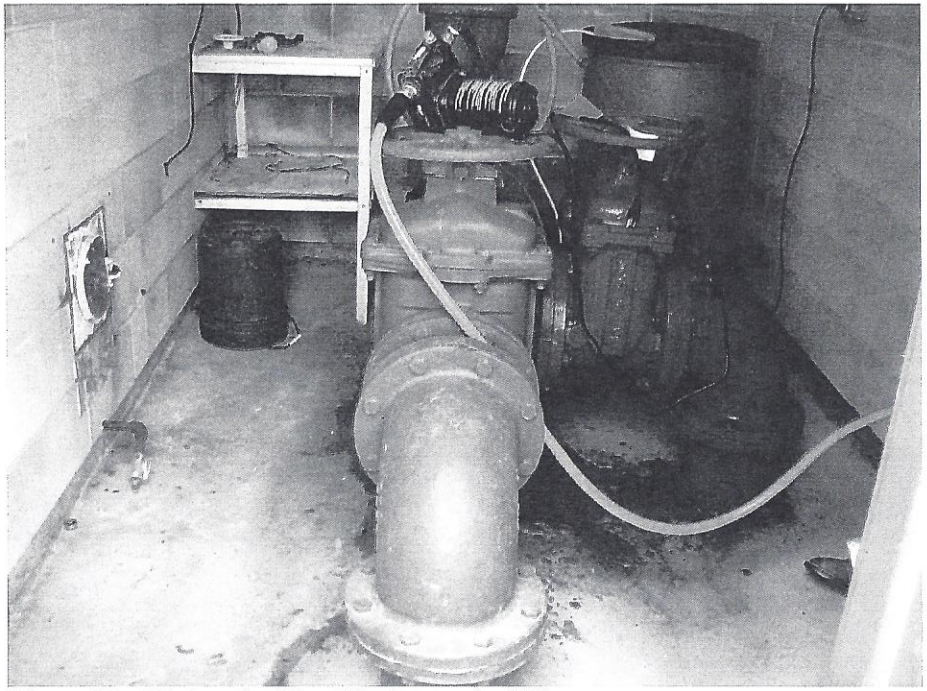


Photo 13. Piping inside chlorinator building

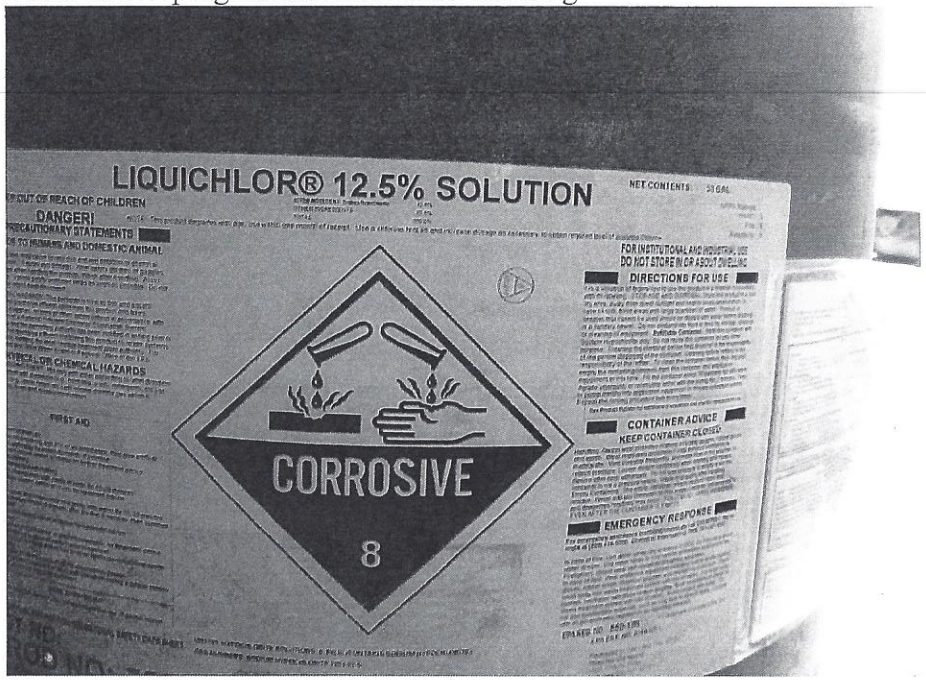


Photo 15. Liquichlor 12.5% solution

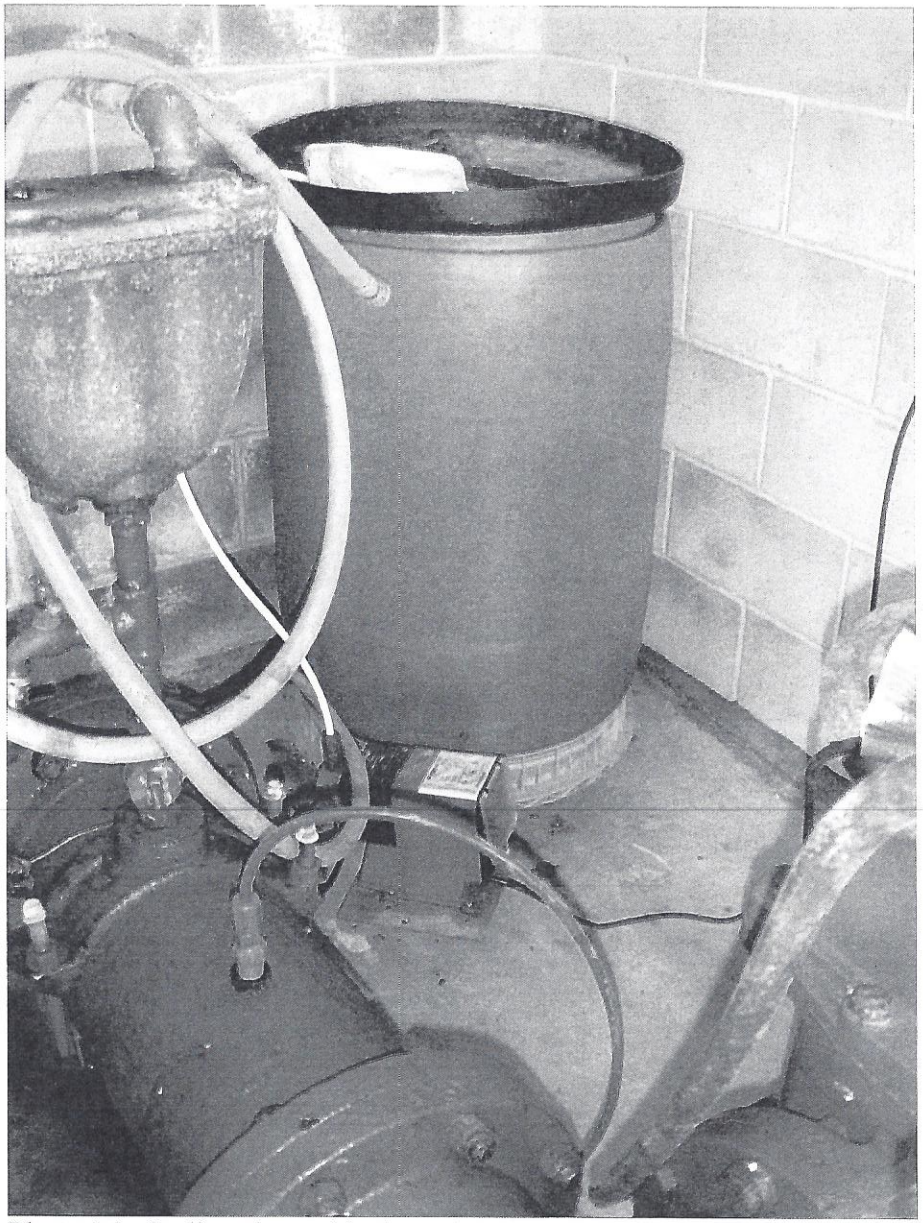


Photo 14. Sodium hypochlorite unit

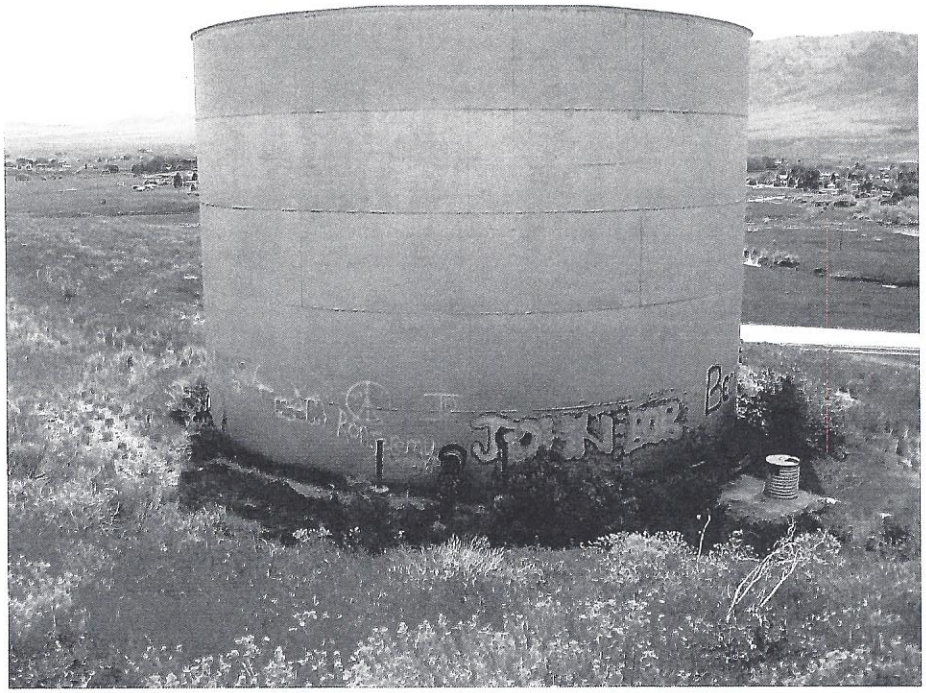


Photo 16. 300,000 gallon storage reservoir

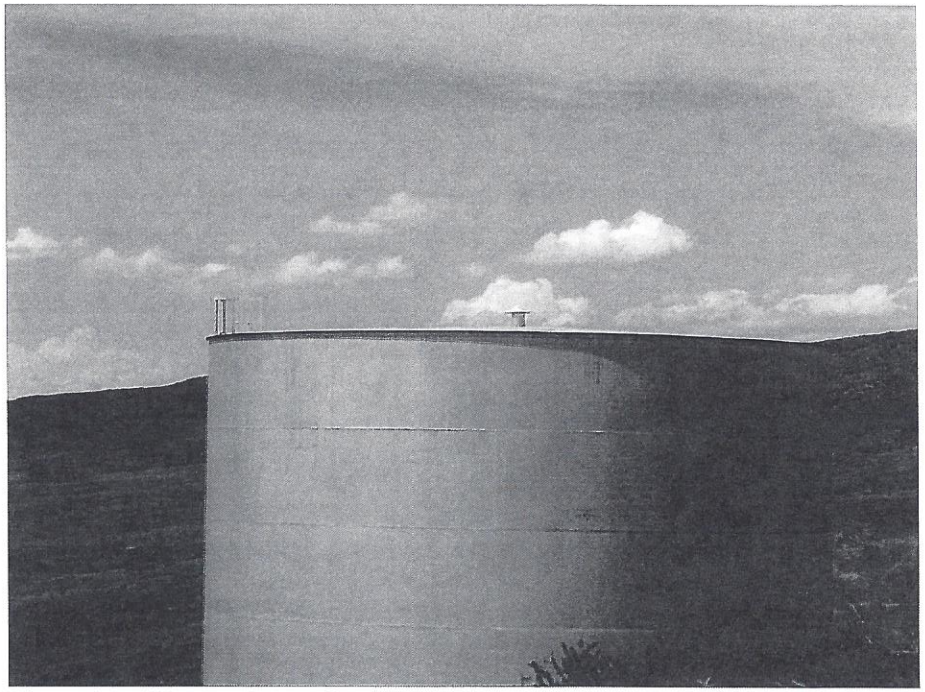


Photo 17. Vent on top of storage reservoir

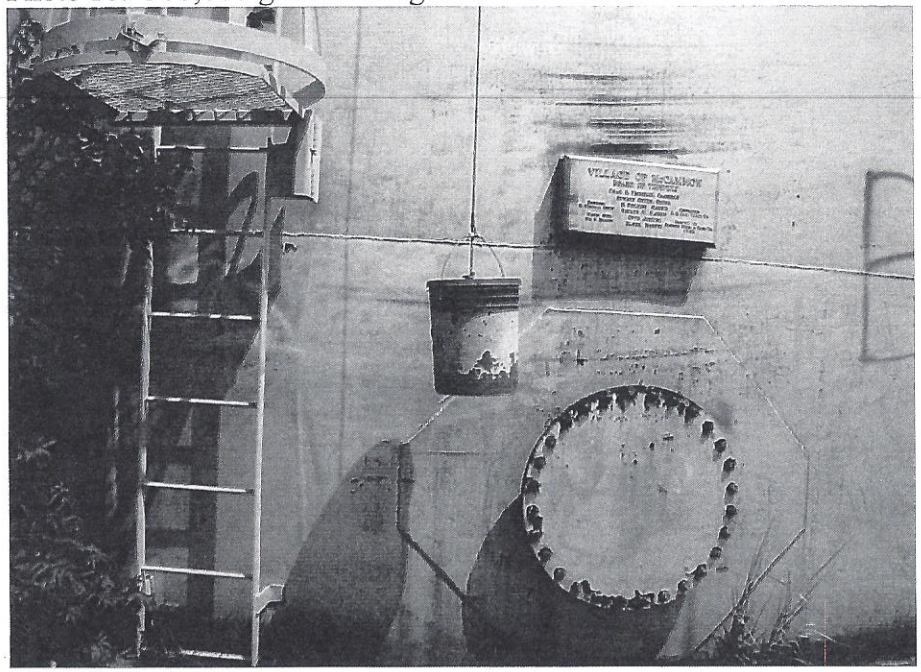


Photo 18. Water level measurement bucket

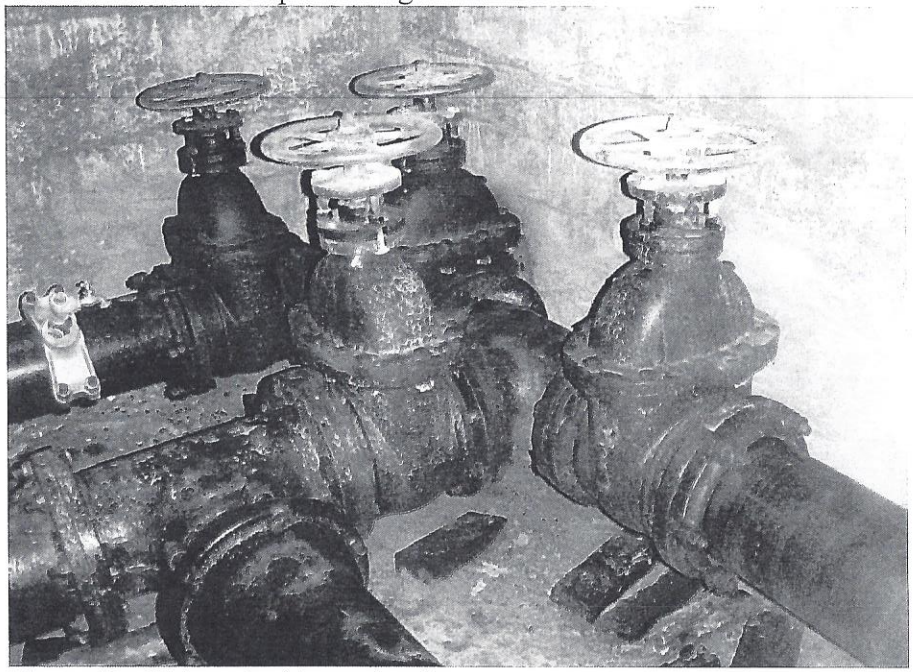


Photo 19. Valves inside vault adjacent to storage reservoir

Photo 20. Overflow/drain pipe for storage reservoir

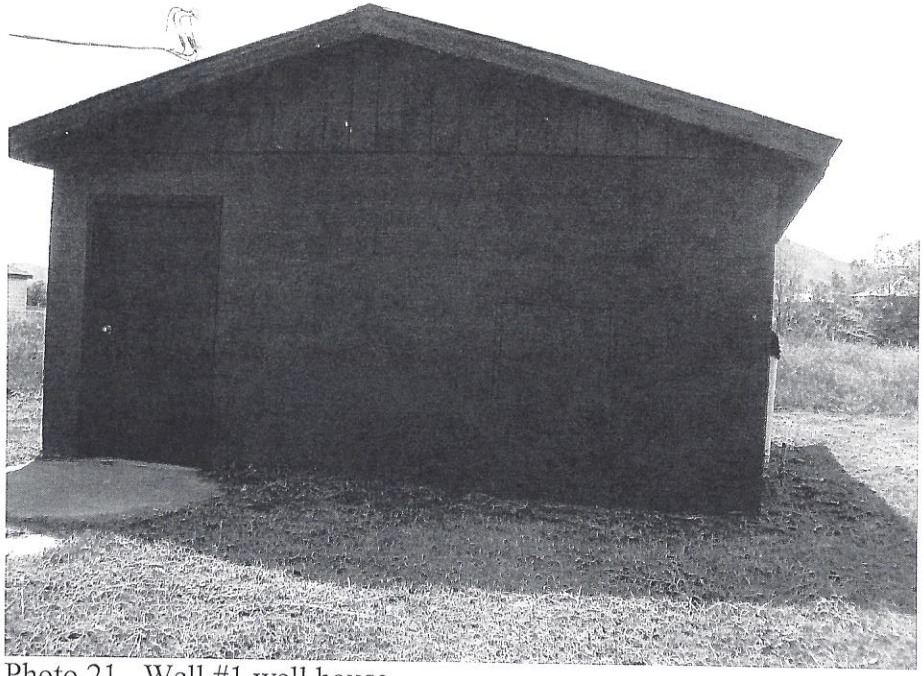


Photo 21. Well #1 well house

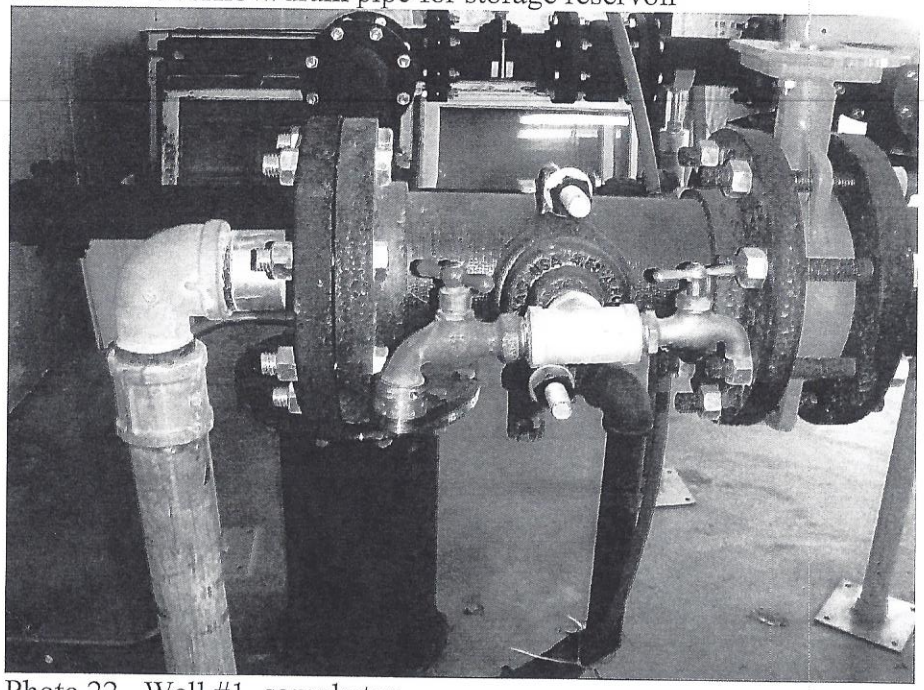


Photo 22. Well #1, sample tap

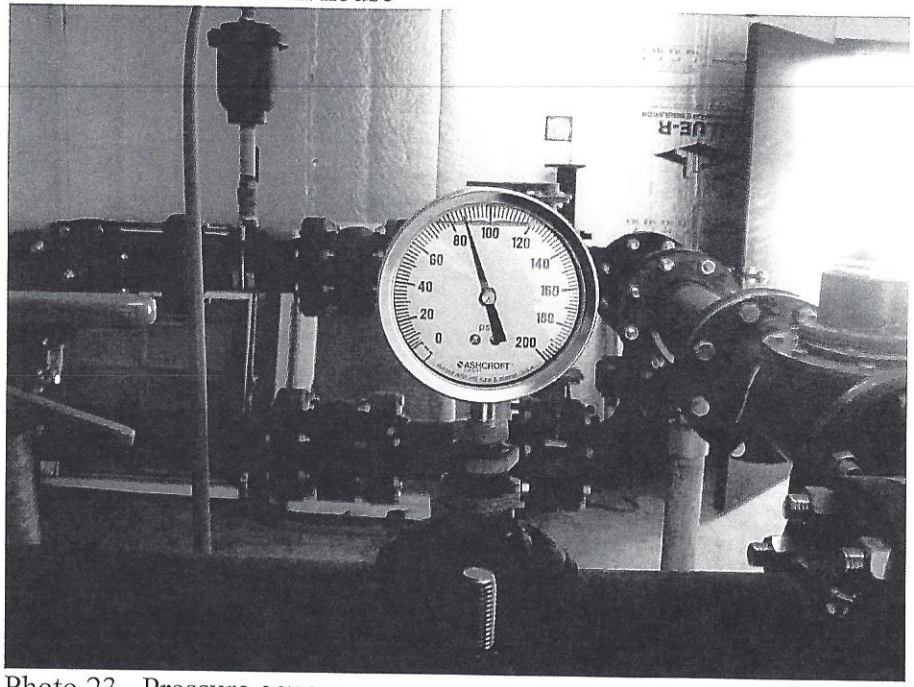


Photo 23. Pressure gauge

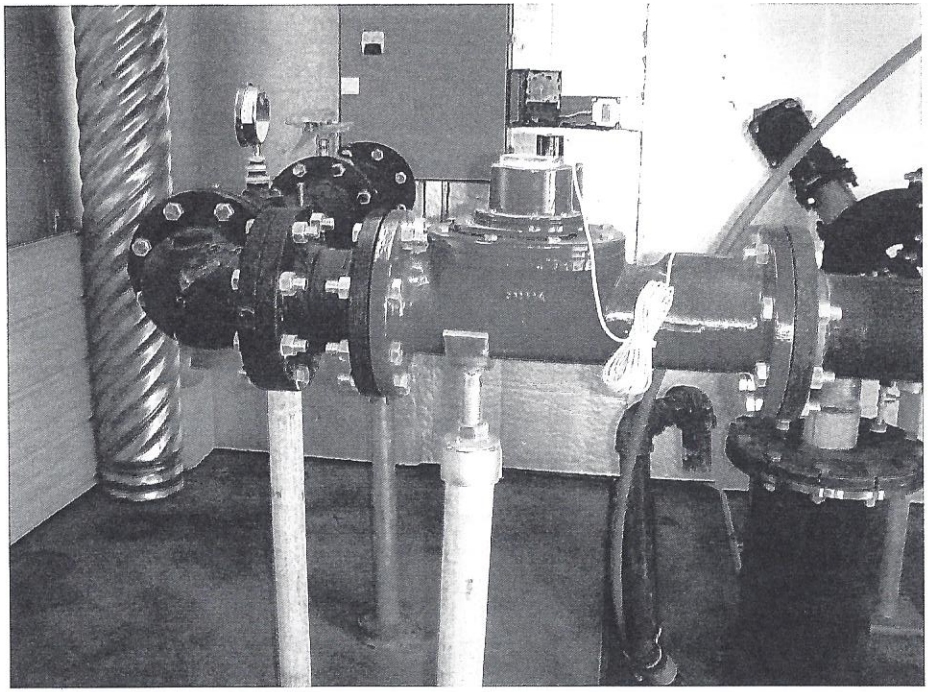


Photo 24. Flow meter

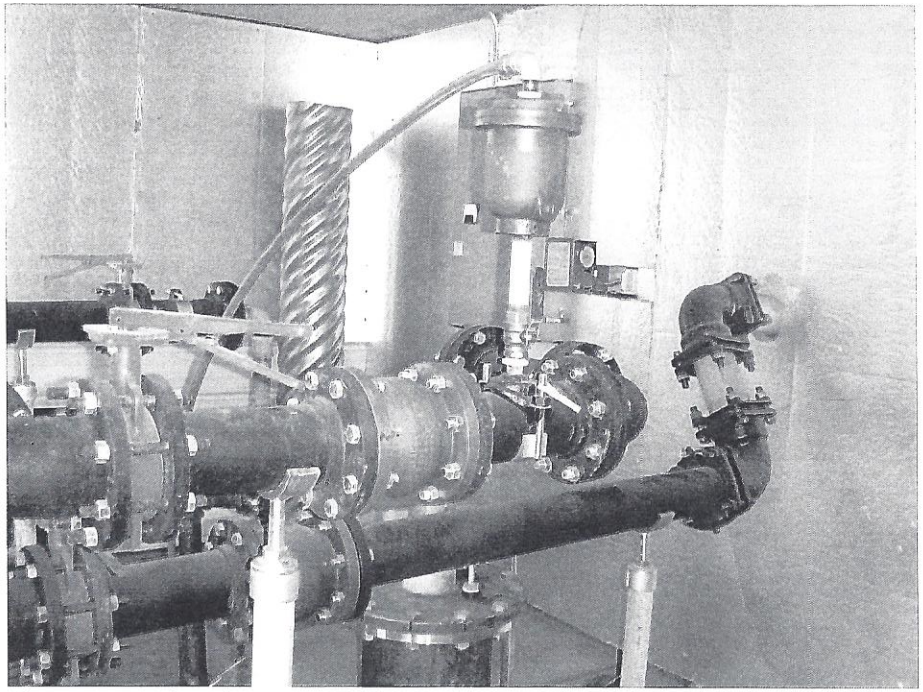


Photo 25. Air release on piping, pump to waste piping

Photo 26. Well #1 pump to waste discharge

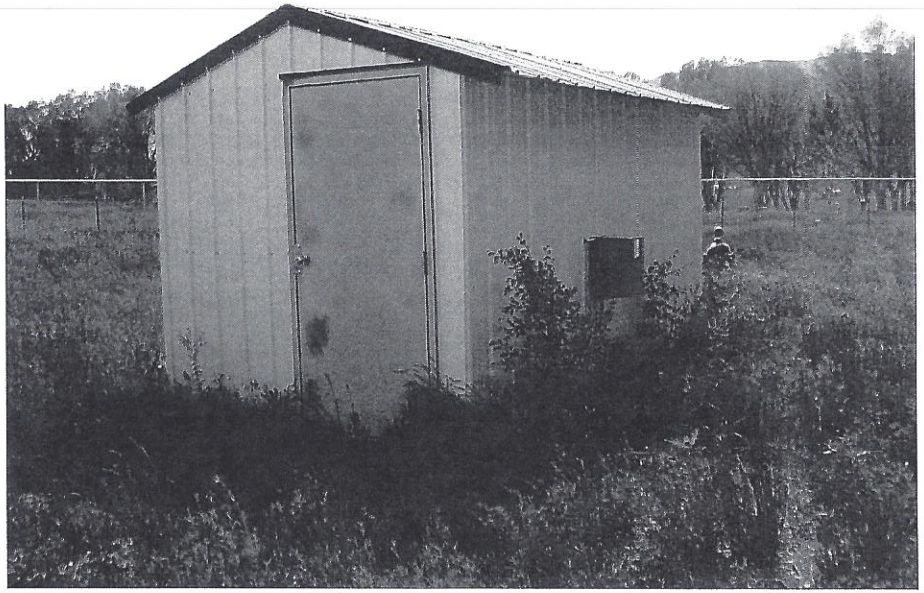


Photo 27. Well #3 (Bitton well) pump house

Photo 28. Well #3

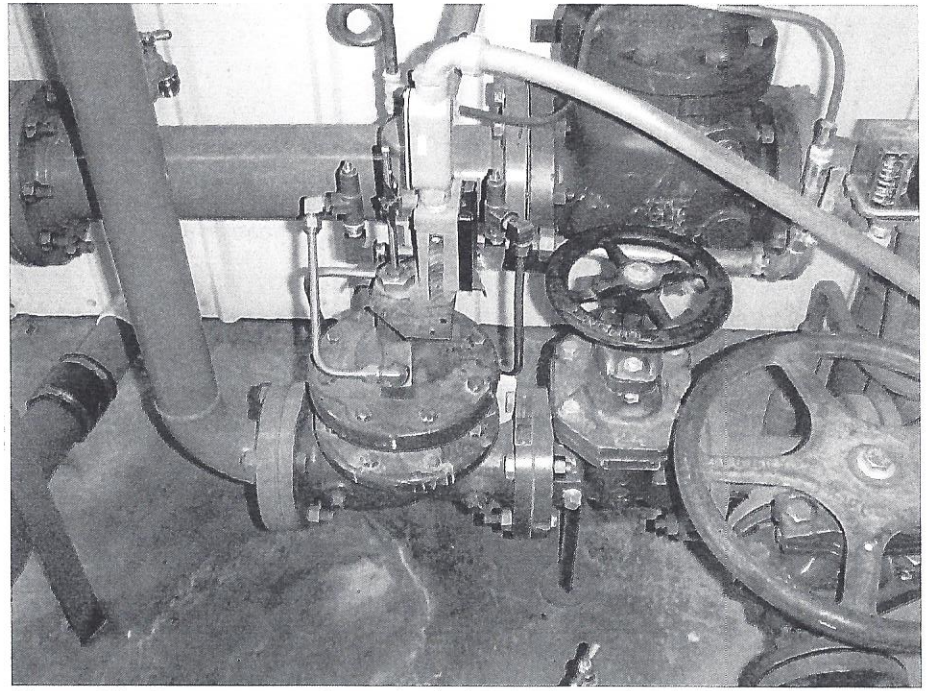


Photo 29. Pressure regulator, isolation valves, check valve

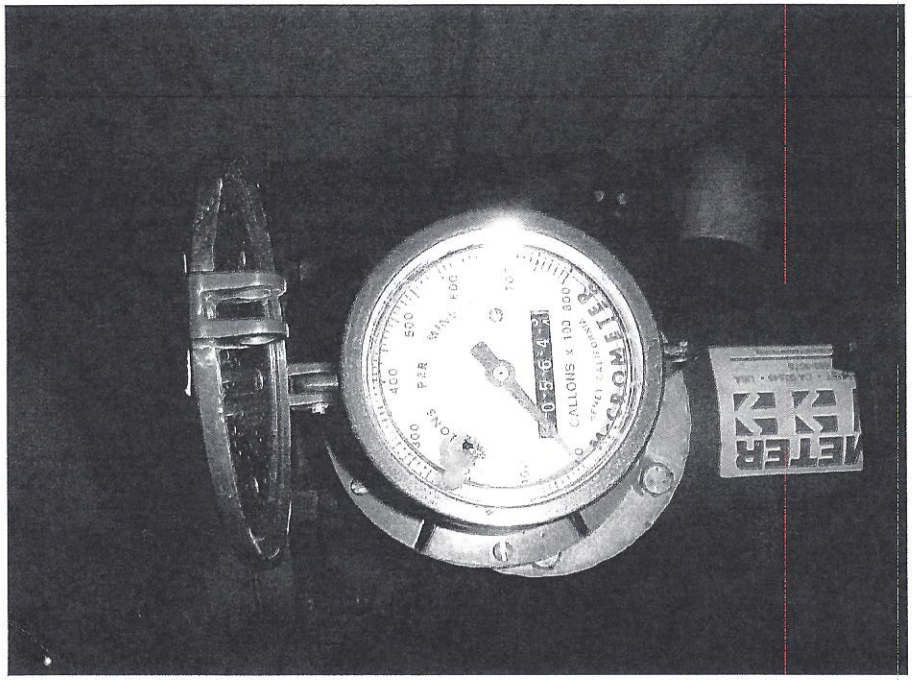


Photo 30. Well #3 flow meter

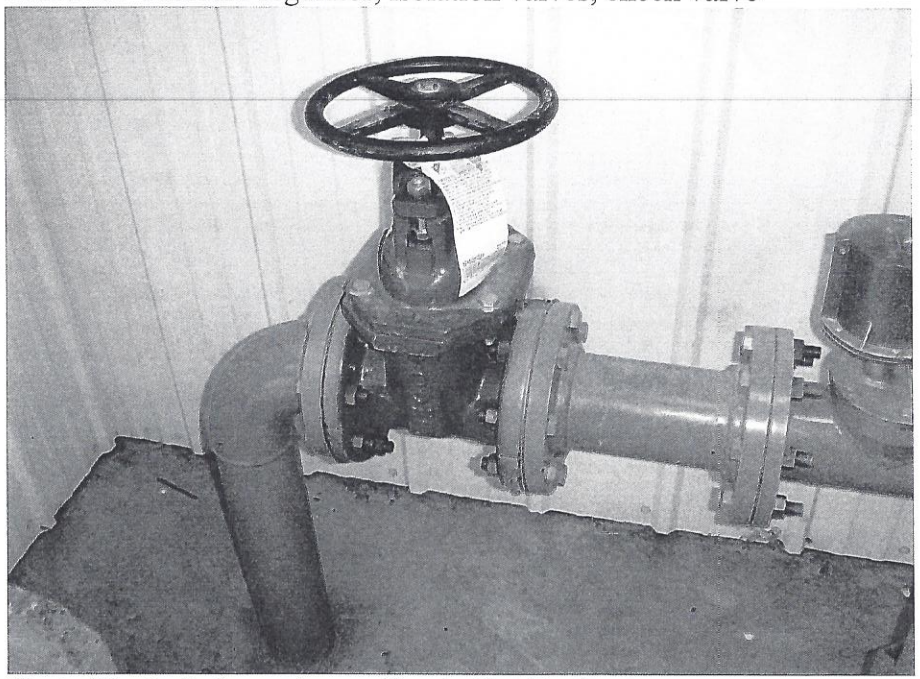


Photo 31. Isolation valve on line to distribution

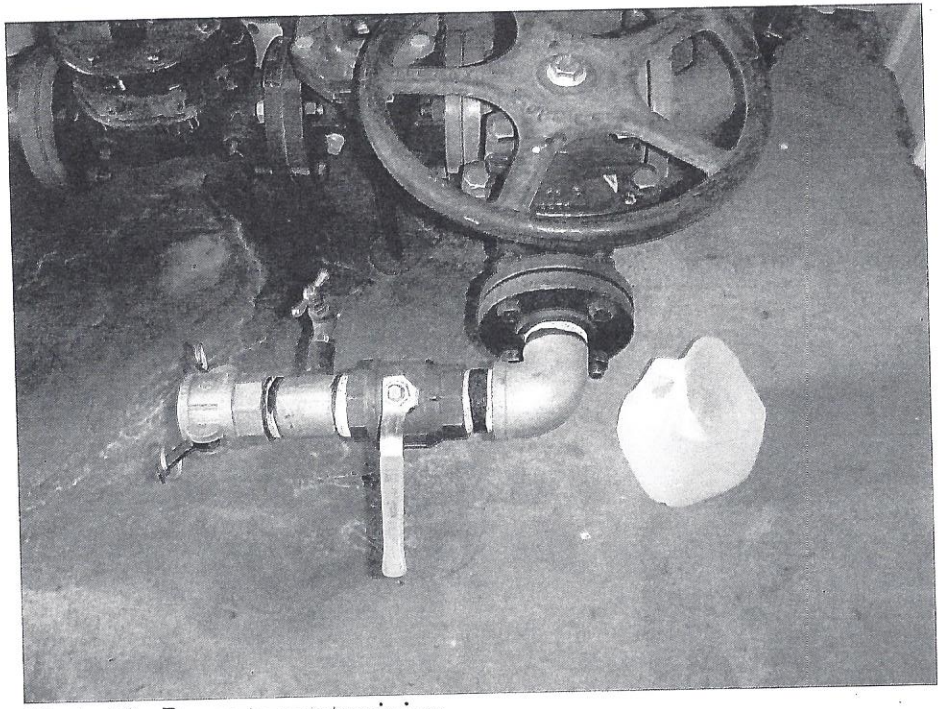


Photo 32. Pump to waste piping

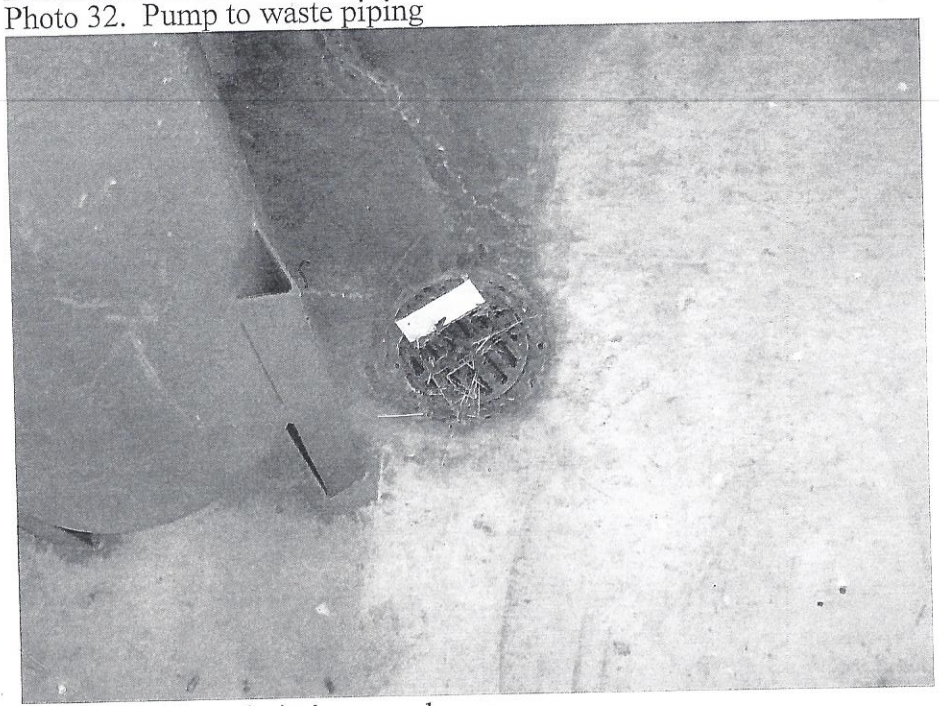


Photo 34. Floor drain in pump house

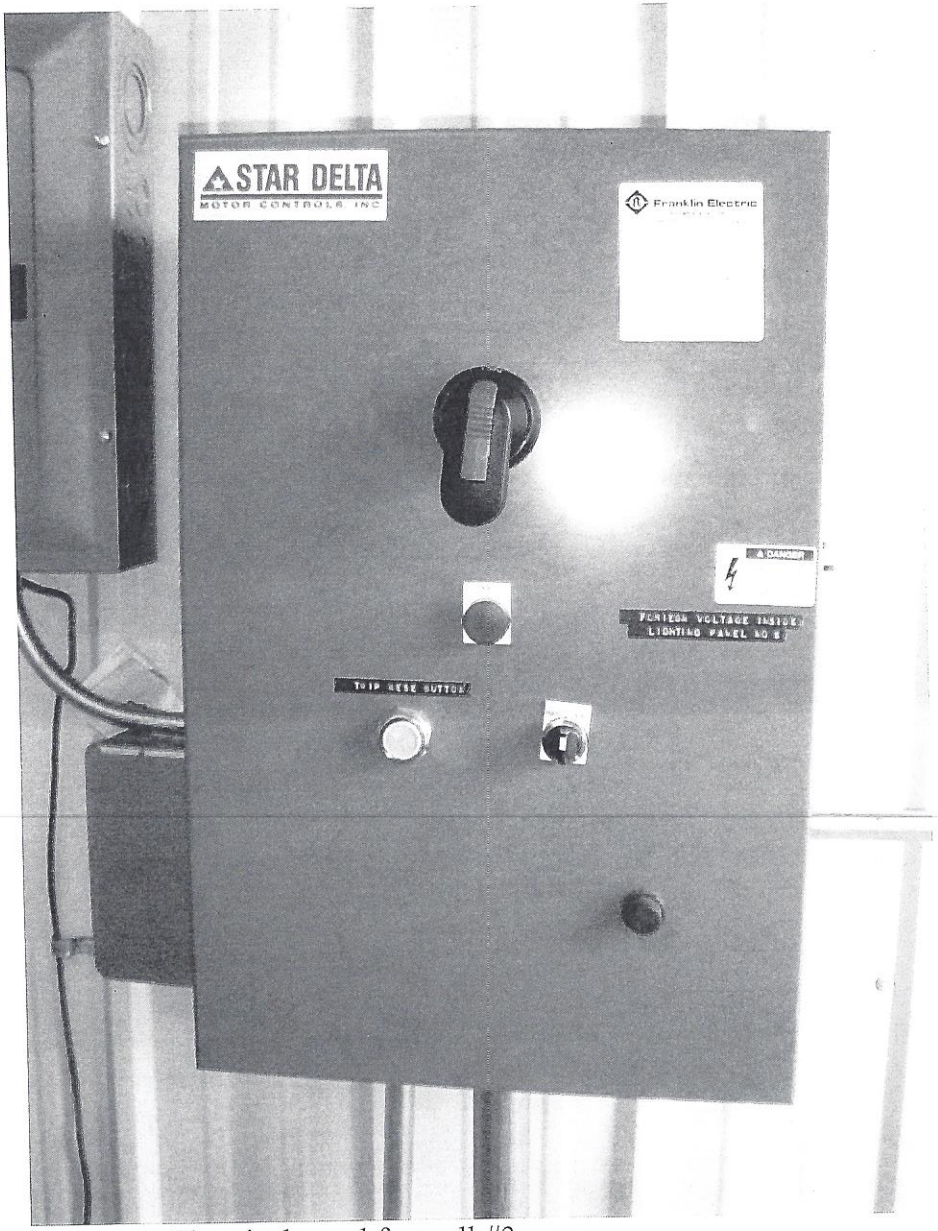
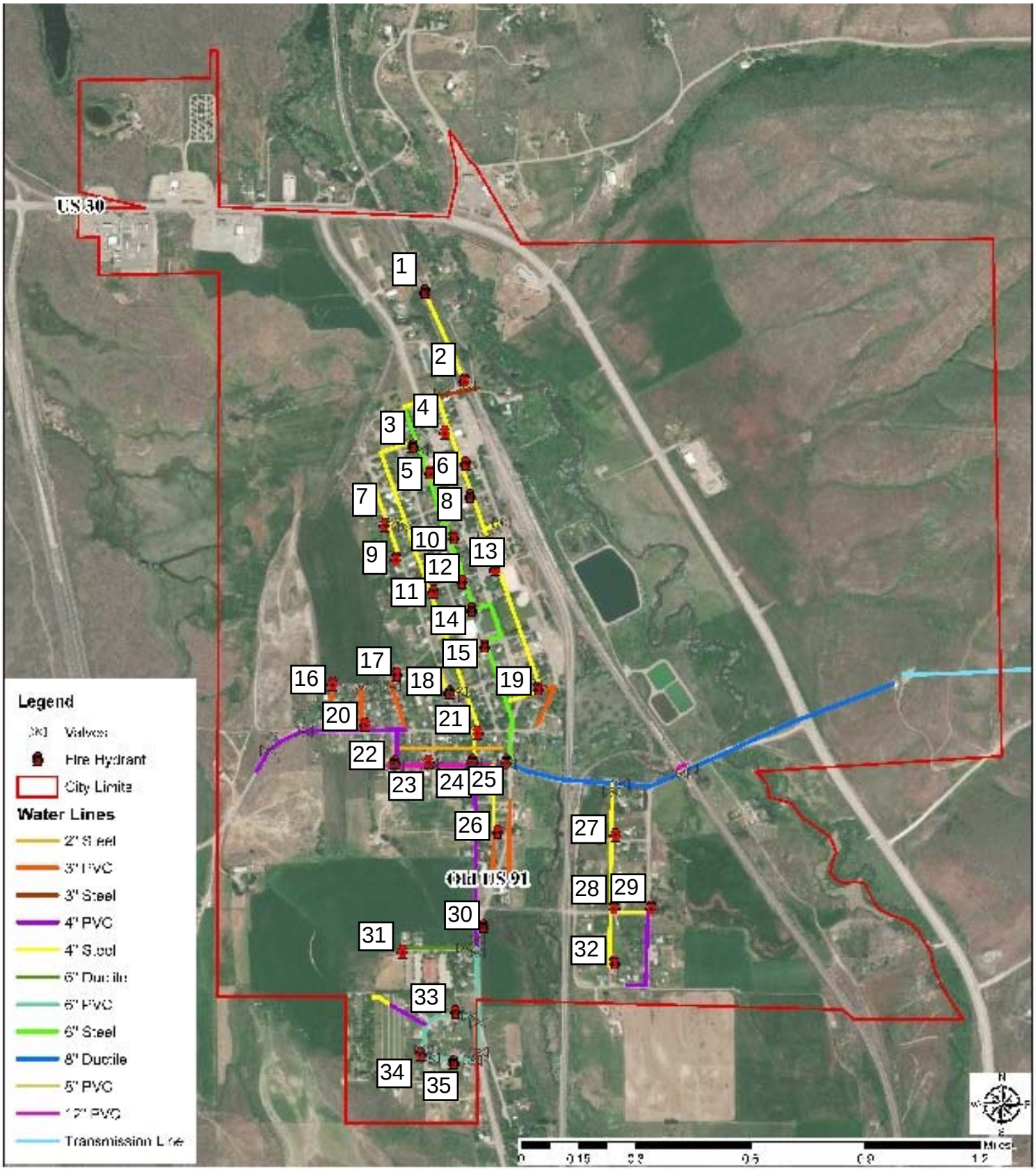


Photo 33. Electrical panel for well #3

McCammon Hydrant Survey

Hydrant	Functioning
1	No Leaks and Cracked
2	Yes
3	
4	Yes
5	
6	
7	Yes
8	
9	Leaks
10	
11	Leaks
12	
13	Yes
14	
15	
16	Froze
17	
18	

Hydrant	Functioning
19	Yes
20	Yes
21	
22	Yes
23	
24	
25	
26	
27	Yes
28	Froze
29	
30	
31	
32	Yes
33	Yes
34	Yes
35	Yes


US 30
Old US 91
1
2
3
4
5
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7
8
9
10
11
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13
14
15
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17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
Legend
Valves
Fire Hydrant
City Limits
Water Lines
2" Steel
3" PVC
3" Steel
4" PVC
4" Steel
6" Ductile
6" PVC
6" Steel
8" Ductile
8" PVC
Transmission Line
Miles

Appendix B: System Reference Information

- 2015-2019 Financials
- Maximum Day Flow Data
- Peak Hour Flow Data
- ISRB Fire Flow Correspondence

CITY OF McCAMMON, IDAHO

BASIC FINANCIAL STATEMENTS

SEPTEMBER 30, 2015

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUE, EXPENDITURES, AND CHANGES IN FUND BALANCES
GOVERNMENTAL FUNDS
YEAR ENDED SEPTEMBER 30, 2015

	General Fund	Street Fund	Park Fund	Totals Governmental Funds
REVENUE:				
Property taxes	$151,163	$41,941	$13,353	$206,457
Sales tax	16,346			16,346
Business Franchise tax	18,232			18,232
Liquor tax	31,411			31,411
Highway users' tax		27,864		27,864
Interest on taxes	1,994			1,994
Revenue sharing	24,946			24,946
Road and bridge		8,404		8,404
Licenses and permits	4,921			4,921
Fire District	5,000			5,000
Garbage fees	54,452			54,452
Interest on investments	796			796
Miscellaneous	4,154	4,100	225	8,479
Total revenue	313,415	82,309	13,578	409,302
EXPENDITURES:				
Current operating:				
General government	184,891			184,891
Public safety	41,595			41,595
Parks and recreation			26,231	26,231
Highways and streets		154,169		154,169
Total expenditures	226,486	154,169	26,231	406,886
EXCESS REVENUE (EXPENDITURES)	86,929	(71,860)	(12,653)	2,416
OTHER FINANCING SOURCES (USES):				
Transfers (to) from other funds	(105,574)	85,698	31,574	11,698
NET CHANGE IN FUND BALANCE	(18,645)	13,838	18,921	14,114
FUND BALANCE - OCTOBER 1, 2014	415,903	(6,762)	(18,633)	390,508
FUND BALANCE - SEPTEMBER 30, 2015	$397,258	$7,076	$288	$404,622

The accompanying notes are an integral part of these statements.

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION
PROPRIETARY FUNDS
YEAR ENDED SEPTEMBER 30, 2015

	Water Fund	Sewer Fund	Totals
REVENUES:			
Service fees	$171,162	$169,356	$340,518
Hookups	4,134	2,000	6,134
Miscellaneous	478	3,385	3,863
	175,774	174,741	350,515
EXPENSES:			
Salaries	37,115	16,870	53,985
Benefits	6,223	2,829	9,052
Supply	3,854	21,808	25,662
Fuel	894	6,038	6,932
Insurance	2,789	3,042	5,831
Dues	2,138	150	2,288
Utilities & telephone	4,684	8,483	13,167
Repairs	9,414	15,491	24,905
Miscellaneous	7,421	1,003	8,424
Depreciation	38,549	68,379	106,928
Total expenses	113,081	144,093	257,174
OPERATING INCOME:	62,693	30,648	93,341
NON-OPERATING REVENUE (EXPENSES):			
Net PERSI plan revenue	684	311	995
Debt service interest	0	(34,179)	(34,179)
INCOME (LOSS)	63,377	(3,220)	60,157
Transfer (to) from other funds	(11,698)	0	(11,698)
NET CHANGE IN POSITION	51,679	(3,220)	48,459
NET POSITION - BEGINNING	918,140	1,722,776	2,640,916
NET POSITION - ENDING	$969,819	$1,719,556	$2,689,375

The accompanying notes are an integral part of these statements.

CITY OF McCAMMON, IDAHO

BASIC FINANCIAL STATEMENTS

SEPTEMBER 30, 2016

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUE, EXPENDITURES, AND CHANGES IN FUND BALANCES
GOVERNMENTAL FUNDS
YEAR ENDED SEPTEMBER 30, 2016

	General Fund	Street Fund	Park Fund	Totals Governmental Funds
REVENUE:				
Property taxes	$163,080	$44,245	$14,039	$221,364
Sales tax	21,196			21,196
Business Franchise tax	18,419			18,419
Liquor tax	29,295			29,295
Highway users' tax		37,062		37,062
Interest on taxes	2,416			2,416
Revenue sharing	11,356	10,000	10,000	31,356
Road and bridge		15,155		15,155
Licenses and permits	2,008			2,008
Fire District	10,000			10,000
Garbage fees	55,536			55,536
Interest on investments	2,303			2,303
Miscellaneous	8,190		2,547	10,737
Total revenue	323,799	106,462	26,586	456,847
EXPENDITURES:				
Current operating:				
General government	210,869			210,869
Public safety	35,554			35,554
Parks and recreation			19,410	19,410
Highways and streets		98,608		98,608
Total expenditures	246,423	98,608	19,410	364,441
EXCESS REVENUE (EXPENDITURES)	77,376	7,854	7,176	92,406
OTHER FINANCING SOURCES (USES):				
Transfers (to) from other funds	0	0	0	0
NET CHANGE IN FUND BALANCE	77,376	7,854	7,176	92,406
FUND BALANCE - OCTOBER 1, 2015	397,258	7,076	288	404,622
FUND BALANCE - SEPTEMBER 30, 2016	$474,634	$14,930	$7,464	$497,028

The accompanying notes are an integral part of these statements.

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION
PROPRIETARY FUNDS
YEAR ENDED SEPTEMBER 30, 2016

	Water Fund	Sewer Fund	Totals
REVENUES:			
Hook-ups	$0	$0	$0
Miscellaneous	14	2,255	2,269
Service fees	175,022	176,013	351,035
	175,036	178,268	353,304
EXPENSES:			
Benefits	7,506	3,413	10,919
Contracts	1,500	1,243	2,743
Depreciation	37,673	68,502	106,175
Dues			0
Fuel	777	720	1,497
Insurance	2,908	3,172	6,080
Miscellaneous	2,505	195	2,700
Repairs	23,977	31,654	55,631
Salaries	36,841	16,746	53,587
Samples	4,665	18,504	23,169
Supply	3,481		3,481
Utilities & telephone	6,742	9,947	16,689
Total expenses	128,575	154,096	282,671
OPERATING INCOME:	46,461	24,172	70,633
NON-OPERATING REVENUE (EXPENSES):			
Debt service interest	(18,935)	(33,175)	(52,110)
INCOME (LOSS)	27,526	(9,003)	18,523
Transfer (to) from other funds	0	0	0
NET CHANGE IN POSITION	27,526	(9,003)	18,523
NET POSITION - BEGINNING	969,819	1,719,556	2,689,375
NET POSITION - ENDING	$997,345	$1,710,553	$2,707,898

The accompanying notes are an integral part of these statements.

CITY OF McCAMMON, IDAHO

BASIC FINANCIAL STATEMENTS

SEPTEMBER 30, 2017

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUE, EXPENDITURES, AND CHANGES IN FUND BALANCES
GOVERNMENTAL FUNDS
YEAR ENDED SEPTEMBER 30, 2017

	General Fund	Street Fund	Park Fund	Totals Governmental Funds
REVENUE:				
Property taxes	$158,020	$43,514	$13,843	$215,377
Sales tax	18,789			18,789
Business Franchise tax	19,049			19,049
Liquor tax	31,259			31,259
Highway users' tax		37,168		37,168
Interest on taxes	2,862			2,862
Revenue sharing	32,250			32,250
Road and bridge		13,438		13,438
Licenses and permits	1,241			1,241
Fire District	5,000			5,000
Garbage fees	57,189			57,189
Interest on investments	5,525			5,525
Miscellaneous	3,459		300	3,759
Total Revenue:	334,643	94,120	14,143	442,906
EXPENDITURES:				
Current operating:				
General government	214,833			214,833
Public safety	41,675			41,675
Parks and recreation			26,673	26,673
Highways and streets		212,931		212,931
Total Expenditures;	256,508	212,931	26,673	496,112
EXCESS REVENUE (EXPENDITURES)	78,135	(118,811)	(12,530)	(53,206)
OTHER FINANCING SOURCES (USES):				
Transfers (to) from other funds	0	0	0	0
NET CHANGE IN FUND BALANCE	78,135	(118,811)	(12,530)	(53,206)
FUND BALANCE - OCTOBER 1, 2016	474,634	14,930	7,464	497,028
FUND BALANCE - SEPTEMBER 30, 2017	$552,769	($103,881)	($5,066)	$443,822

The accompanying notes are an integral part of these statements.

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION
PROPRIETARY FUNDS
YEAR ENDED SEPTEMBER 30, 2017

	Water Fund	Sewer Fund	Totals
REVENUES:			
Hook-ups	$100		$100
Miscellaneous	50	$1,200	1,250
Service fees	183,850	188,250	372,100
Total Revenues:	184,000	189,450	373,450
EXPENSES:			
Benefits	4,637	2,106	6,743
Contracts	1,720	15,337	17,057
Depreciation	38,787	64,063	102,850
Dues			0
Fuel	863	4,342	5,205
Insurance	3,033	3,308	6,341
Miscellaneous	2,252	68	2,252
Repairs	30,779	12,898	43,677
Salaries	39,027	17,740	56,767
Samples	251		251
Supply	12,728	33,190	45,918
Utilities & telephone	3,886	10,477	14,363
Total Expenses:	137,963	163,529	301,424
OPERATING INCOME:	46,037	25,921	72,026
NON-OPERATING REVENUE (EXPENSES):			
Insurance proceeds	10,000		10,000
Debt service interest	(9,419)	(31,964)	(41,383)
INCOME (LOSS)	46,618	(6,043)	40,575
Transfer (to) from other funds	0	0	0
NET CHANGE IN POSITION	46,618	(6,043)	40,575
NET POSITION - BEGINNING	997,345	1,710,553	2,707,898
NET POSITION - ENDING	$1,043,963	$1,704,510	$2,748,473

The accompanying notes are an integral part of these statements.

CITY OF McCAMMON, IDAHO

BASIC FINANCIAL STATEMENTS

SEPTEMBER 30, 2018

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUE, EXPENDITURES, AND CHANGES IN FUND BALANCES
GOVERNMENTAL FUNDS
YEAR ENDED SEPTEMBER 30, 2018

	General Fund	Street Fund	Park Fund	Totals Governmental Funds
REVENUE:				
Business franchise tax	$18,786			$18,786
Fire District				0
Garbage fees	56,960			56,960
Highway users' tax		$37,648		37,648
Interest on investments	12,192			12,192
Interest on taxes	3,095			3,095
Licenses and permits	8,363			8,363
Liquor tax	32,589			32,589
Miscellaneous	7,932		$600	8,532
Property taxes	167,531	46,078	14,620	228,229
Revenue sharing	34,030			34,030
Road and bridge		9,957		9,957
Sales tax	20,235			20,235
Total Revenue:	361,713	93,683	15,220	470,616
EXPENDITURES:				
Current operating:				
General government	245,570			245,570
Highways and streets		173,129		173,129
Parks and recreation			21,418	21,418
Public safety	35,388			35,388
Total Expenditures:	280,958	173,129	21,418	475,505
EXCESS REVENUE (EXPENDITURES)	80,755	(79,446)	(6,198)	(4,889)
OTHER FINANCING SOURCES (USES):				
Transfers (to) from other funds	(113,930)	108,996	4,934	0
NET CHANGE IN FUND BALANCE	(33,175)	29,550	(1,264)	(4,889)
FUND BALANCE - OCTOBER 1, 2017	552,769	(103,881)	(5,066)	443,822
FUND BALANCE - SEPTEMBER 30, 2018	$519,594	($74,331)	($6,330)	$438,933

The accompanying notes are an integral part of these statements.

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION
PROPRIETARY FUNDS
YEAR ENDED SEPTEMBER 30, 2018

	Water Fund	Sewer Fund	Totals
REVENUES:			
Hook-ups	$3,557		$3,557
Miscellaneous		$100	100
Service fees	169,449	172,602	342,051
Total Revenues:	173,006	172,702	345,708
EXPENSES:			
Benefits	7,349	3,341	10,690
Contracts	100	1,970	2,070
Depreciation	38,943	72,579	111,522
Dues			0
Fuel	812	3,517	4,329
Insurance	3,370	3,676	7,046
Miscellaneous	5,372	210	2,252
Repairs	25,866	13,144	39,010
Salaries	37,659	17,117	54,776
Samples	1,418		1,418
Supply	3,917	27,932	31,849
Travel and training	202	120	322
Utilities & telephone	9,670	9,141	18,811
Total Expenses:	134,678	152,747	284,095
OPERATING INCOME:	38,328	19,955	61,613
NON-OPERATING REVENUE (EXPENSES):			
Debt service interest	(9,600)	(31,569)	(41,169)
INCOME (LOSS)	28,728	(11,614)	17,114
Transfer (to) from other funds	0	0	0
NET CHANGE IN POSITION	28,728	(11,614)	17,114
NET POSITION - BEGINNING	1,043,963	1,704,510	2,748,473
NET POSITION - ENDING	$1,072,691	$1,692,896	$2,765,587

The accompanying notes are an integral part of these statements.

CITY OF McCAMMON, IDAHO

BASIC FINANCIAL STATEMENTS

SEPTEMBER 30, 2019

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUE, EXPENDITURES, AND CHANGES IN FUND BALANCES
GOVERNMENTAL FUNDS
YEAR ENDED SEPTEMBER 30, 2019

	General Fund	Street Fund	Park Fund	Totals Governmental Funds
REVENUE:				
Business franchise tax	$17,630			$17,630
Fire District	12,215			12,215
Garbage fees	57,580			57,580
Highway users' tax		$39,492		39,492
Interest on investments	21,883			21,883
Interest on taxes	2,578			2,578
Licenses and permits	2,529			2,529
Liquor tax	32,708			32,708
Miscellaneous	24,272		$650	24,922
Property taxes	171,539	48,105	15,184	234,828
Revenue sharing	15,476	10,000	10,000	35,476
Road and bridge		8,955		8,955
Sales tax	24,818			24,818
Total Revenue:	383,228	106,552	25,834	515,614
EXPENDITURES:				
Current operating:				
General government	278,379			278,379
Highways and streets		186,182		186,182
Parks and recreation			18,684	18,684
Public safety	49,276			49,276
Total Expenditures:	327,655	186,182	18,684	532,521
EXCESS REVENUE (EXPENDITURES)	55,573	(79,630)	7,150	(16,907)
OTHER FINANCING SOURCES (USES):				
Transfers (to) from other funds	(89,401)	83,266	6,135	0
NET CHANGE IN FUND BALANCE	(33,828)	3,636	13,285	(16,907)
FUND BALANCE - OCTOBER 1, 2018	519,594	(74,331)	(6,330)	438,933
FUND BALANCE - SEPTEMBER 30, 2019	$485,766	($70,695)	$6,955	$422,026

The accompanying notes are an integral part of these statements.

CITY OF McCAMMON, IDAHO

STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION
PROPRIETARY FUNDS
YEAR ENDED SEPTEMBER 30, 2019

	Water Fund	Sewer Fund	Totals
REVENUES:			
Hook-ups			$0
Miscellaneous	$280	$1,680	1,960
Service fees	175,986	176,939	352,925
Total Revenues:	176,266	178,619	354,885
EXPENSES:			
Benefits	6,540	2,989	9,529
Contracts	100	9,608	9,708
Depreciation	49,896	70,605	120,501
Dues	5,118		5,118
Fuel	835	2,942	3,777
Insurance	1,733	1,891	3,624
Miscellaneous		330	330
Repairs	31,186	17,867	49,053
Salaries	37,960	17,477	55,437
Samples	2,504		2,504
Supply	3,220	32,800	36,020
Travel and training	133		133
Utilities & telephone	3,303	7,342	10,645
Total Expenses:	142,528	163,851	306,379
OPERATING INCOME:	33,738	14,768	48,506
NON-OPERATING REVENUE (EXPENSES):			
Debt service interest	(11,231)	(30,322)	(41,553)
INCOME (LOSS)	22,507	(15,554)	6,953
Transfer (to) from other funds	0	0	0
NET CHANGE IN POSITION	22,507	(15,554)	6,953
NET POSITION - BEGINNING	1,072,691	1,692,896	2,765,587
NET POSITION - ENDING	$1,095,198	$1,677,342	$2,772,540

The accompanying notes are an integral part of these statements.

Peak Day Flow Rate

Date/Time	Well Flow (gal)	Tank Flow (gal)	Hourly Total (gal)	Daily Total (gal)	Daily Flow (gpm)
07/11/2019 22:00:00	10744	42250	52994	1027266	713.4
07/11/2019 23:00:00	10369	42205	52574	1037480	720.5
07/12/2019 00:00:00	10257	42076	52333	1047523	727.4
07/12/2019 01:00:00	10389	42136	52525	1057733	734.5
07/12/2019 02:00:00	10569	42165	52734	1068142	741.8
07/12/2019 03:00:00	10453	42313	52766	1078573	749.0
07/12/2019 04:00:00	10261	42156	52417	1088657	756.0
07/12/2019 05:00:00	10231	42236	52467	1098976	763.2
07/12/2019 06:00:00	10120	42090	52210	1108846	770.0
07/12/2019 07:00:00	10035	42104	52139	1118954	777.1
07/12/2019 08:00:00	9921	42254	52175	1129059	784.1
07/12/2019 09:00:00	9924	42256	52180	1139030	791.0
07/12/2019 10:00:00	9951	42247	52198	1148807	797.8
07/12/2019 11:00:00	9924	42079	52003	1158632	804.6
07/12/2019 12:00:00	9699	42337	52036	1168303	811.3
07/12/2019 13:00:00	9561	42240	51801	1177904	818.0
07/12/2019 14:00:00	9341	42304	51645	1187418	824.6
07/12/2019 15:00:00	9351	42131	51482	1196726	831.1
07/12/2019 16:00:00	9494	42286	51780	1206204	837.6
07/12/2019 17:00:00	9461	42193	51654	1215542	844.1
07/12/2019 18:00:00	9668	42261	51929	1225225	850.9
07/12/2019 19:00:00	9744	42248	51992	1234795	857.5
07/12/2019 20:00:00	9629	42448	52077	1244650	864.3
07/12/2019 21:00:00	9821	42226	52047	1252158	**869.6**

9/25/2019
McCammon WFPS
217112-000

KELLER ASSOCIATES

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Peak Hour Flow Rate

Date/Time	Well Flow (gal)	Tank Flow (gal)	Hourly Total (gal)	Hourly Flow (gpm)
07/25/2019 19:00:00	0	42119	42119	702.0
07/25/2019 20:00:00	0	42268	42268	704.5
07/25/2019 21:00:00	0	39888	39888	664.8
07/25/2019 22:00:00	1	42234	42235	703.9
07/25/2019 23:00:00	0	42275	42275	704.6
07/26/2019 00:00:00	1	42202	42203	703.4
07/26/2019 01:00:00	0	42200	42200	703.3
07/26/2019 02:00:00	6779	42212	48991	816.5
07/26/2019 03:00:00	11338	42102	53440	**890.7**
07/26/2019 04:00:00	11094	42291	53385	889.8
07/26/2019 05:00:00	10668	42052	52720	878.7
07/26/2019 06:00:00	10598	41986	52584	876.4
07/26/2019 07:00:00	10464	42039	52503	875.1
07/26/2019 08:00:00	10360	42114	52474	874.6
07/26/2019 09:00:00	10377	41991	52368	872.8
07/26/2019 10:00:00	10460	41908	52368	872.8
07/26/2019 11:00:00	10111	42040	52151	869.2
07/26/2019 12:00:00	6450	42053	48503	808.4
07/26/2019 13:00:00	0	42046	42046	700.8
07/26/2019 14:00:00	0	42159	42159	702.7
07/26/2019 15:00:00	1	42021	42022	700.4
07/26/2019 16:00:00	0	42136	42136	702.3
07/26/2019 17:00:00	0	42120	42120	702.0
07/26/2019 18:00:00	0	42138	42138	702.3

9/25/2019
McCammon WFPS
217112-000

KELLER ASSOCIATES

Seth Thompson

From: Corey R. Ries <crries@isrb.com>
Sent: Tuesday, September 3, 2019 10:43 AM
To: Seth Thompson
Cc: Jaden Jackson; Marvin Fielding
Subject: RE: McCammon Idaho Specific Fire Flows

Good Morning Seth,

Doug had the good fortune of being able to retire last December shifting me into his vacated position. I will do my best to provide you with the information you requested.

For McCammon, the basic fire flow we had back when we graded the city back in 2015 was 1,250 gallons per minute based on the 5th highest NFF we had for the community at the time. It appears that the building with the greatest fire flow need that we have specifically looked at is the Mountain View Elementary school with a NFF of 4,000 gpm. The next biggest are a welding shop and a café at 1,500 each. Then the couple smaller ones and the Flying J on Hwy 30 at 1,250 gpm.

I am guessing that the church off of W 16th is sprinklered, but if not, it would probably be a NFF of 3,000 assuming masonry walls and combustible roof.

Please let me know if this is not the information you are looking for.

Corey

From: Seth Thompson <sthompson@Kellerassociates.com>
Sent: Thursday, August 29, 2019 11:09 AM
To: Douglas H. Young <dyoung@isrb.com>
Cc: Jaden Jackson <jjackson@Kellerassociates.com>; Marvin Fielding <mfielding@Kellerassociates.com>
Subject: McCammon Idaho Specific Fire Flows

Hello Doug,

I am working on a hydraulic model for the City of McCammon, Idaho, and I am modeling fire flow as part of that. Are there any structures with specific fire flow needs in McCammon? Also, what would you recommend for the base fire flow for the rest of the city?
Thank you for your help with this.

KELLER ASSOCIATES

SETH THOMPSON, EI
Project Engineer
DIRECT 208-244-5061 | CELL 385-239-3311 | OFFICE 208-542-6120
3153 McNeil Drive, Idaho Falls, ID 83402
kellerassociates.com

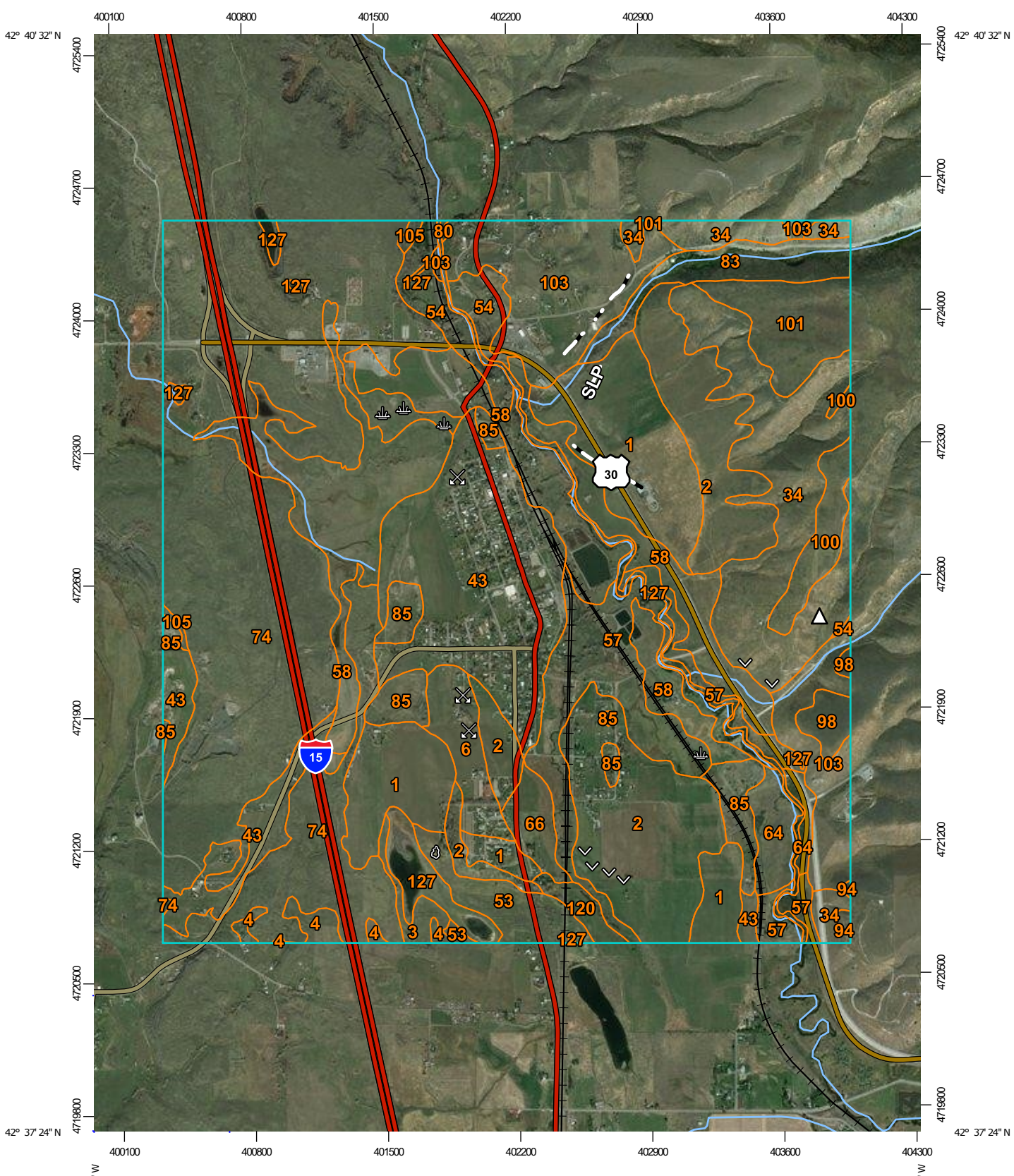
Appendix C: Environmental Reference Information

- NRCS Soil Report and Map
- Preliminary Hydrogeological Study
- U.S. Fish & Wildlife – Endangered Species List
- USDA – Endangered Plants List
- FEMA Flood Insurance Rate Maps
- Wetland Classifications
- 2018 & 2019 Consumer Confidence Reports

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bannock County Area, Idaho, Parts of Bannock and Power Counties
Survey Area Data: Version 15, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 22, 2005—Nov 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Arbone silt loam, 1 to 4 percent slopes	254.5	7.4%
2	Arbone silt loam, 4 to 12 percent slopes	326.4	9.5%
3	Arbone-Hondoho complex, 12 to 20 percent slopes	13.9	0.4%
4	Arbone-McCarey-Lava flows complex, 4 to 12 percent slopes	18.4	0.5%
6	Arimo silt loam, 0 to 3 percent slopes	48.3	1.4%
34	Cedarhill, high precipitation-Hondoho-Arbone complex, 20 to 50 percent slopes	259.7	7.5%
43	Downey-Arimo complex, 3 to 8 percent slopes	339.3	9.8%
53	Hondoho-Arbone complex, 4 to 12 percent slopes	50.0	1.5%
54	Hondoho-Arbone-Ririe complex, 20 to 50 percent slopes	61.8	1.8%
57	Inkom silt loam, 0 to 1 percent slopes	181.5	5.3%
58	Inkom silt loam, drained, 0 to 1 percent slopes	369.3	10.7%
64	Joevar silt loam, 0 to 3 percent slopes	41.7	1.2%
66	Lanoak silt loam, 4 to 12 percent slopes	27.4	0.8%
74	Lava flows-McCarey-McCarey variant complex, 1 to 8 percent slopes	870.6	25.3%
80	Moonlight-Pavohroo complex, 30 to 60 percent slopes	0.7	0.0%
83	Pavohroo-Moonlight complex, 30 to 60 percent slopes	61.5	1.8%
85	Pits, gravel	73.0	2.1%
94	Rexburg silt loam, 4 to 12 percent slopes	2.7	0.1%
98	Ririe silt loam, 4 to 12 percent slopes	19.5	0.6%
100	Ririe-Watercanyon complex, 4 to 12 percent slopes	39.3	1.1%
101	Ririe-Watercanyon complex, 12 to 20 percent slopes	72.1	2.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
103	Ririe-Watercanyon-Cedarhill complex, 12 to 30 percent slopes	221.6	6.4%
105	Rubble land-Haploxerolls complex, 20 to 80 percent slopes	4.7	0.1%
120	Watercanyon silt loam, 12 to 20 percent slopes	15.2	0.4%
127	Water	72.4	2.1%
Totals for Area of Interest		**3,445.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

PRELIMINARY DRAFT

Hydrogeologic study for the Town of McCammon

INTRODUCTION

The town of McCammon, located within the Portneuf Valley, derives domestic water from a two wells and a spring (Figure 1). These sources serve approximately 805 people (US Bureau of the Census, 2001). The spring is the primary source of water while the wells serve as a backup. The town's two wells, New and Old, derive water from a gravel aquifer below a confining blue-clay layer.

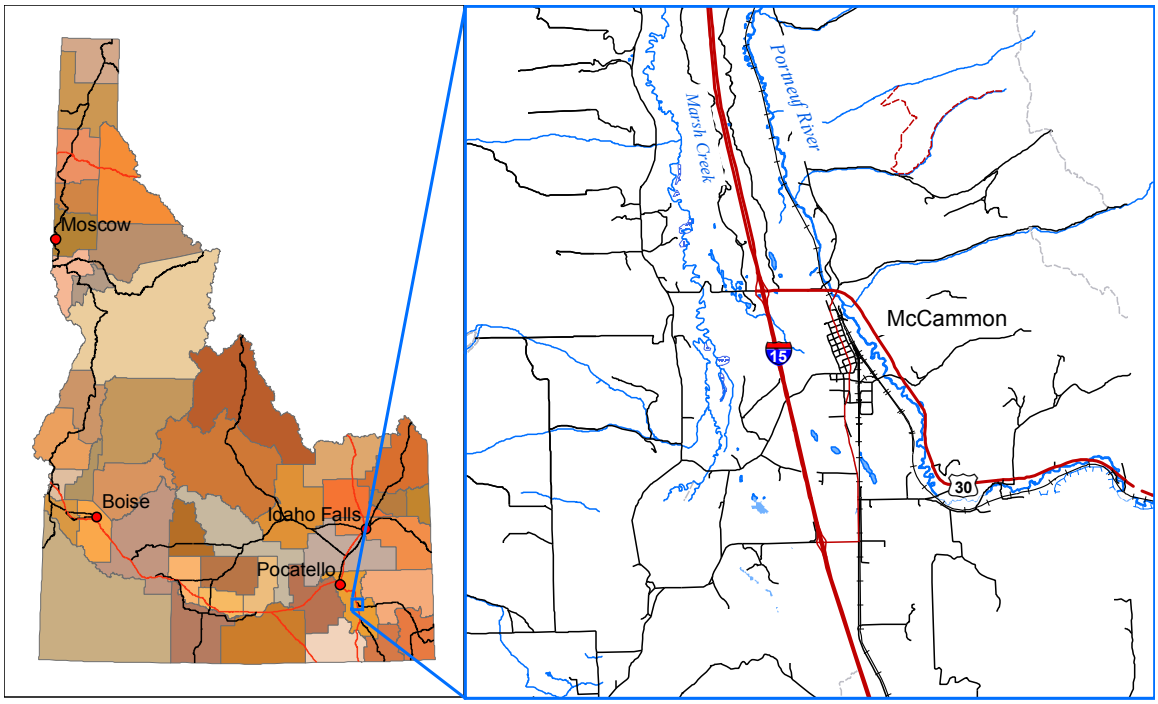


Figure 1 - Location map of the town of McCammon.

STATEMENT OF PROBLEM

City officials indicated during summer months, the town uses the New well to supplement its water supply since the spring does not provide the volume needed. They also indicated that several summers ago the town had to use the Old well for prolonged periods. When the town needed additional water the next summer, the well began pumping water and sand. The town decided in year 2000 to drill the New well to resolve the sand pumping problem. Recently this well also began pumping water and sand.

PURPOSE AND OBJECTIVES

This project provides hydrogeologic information regarding ground water development to the town of McCammon. Objectives for providing information regarding future planning are to:

1. Determine why the well(s) pump sand.
2. Provide possible solutions to prevent sand from entering the well.

3. Find another possible well location for additional water.

PROJECT AREA GEOLOGY

Two geologic units underlie the shallow subsurface below McCammon, unconsolidated sediments and basalt. The unconsolidated sediments include gravel and clay in the valley and loess soil northeast of the Portneuf River. The basalt overlies most of the clays and gravels in the valley except for a topographic ridge underlying McCammon. This ridge was likely an old bank of the Portneuf River. As basalt lava flowed down the Portneuf River valley it cooled and filled the river channel but left the ridge uncovered.

The project team identified two basalt flows at McCammon, the Portneuf River flow and the Marsh Creek flow (Figure 2). The ridge on which McCammon rests separates the two flows. The Portneuf River basalt originated from the Lava Hot Springs area (Otto and others, 2003) and the Marsh Creek basalt may have come from the Inkom area.

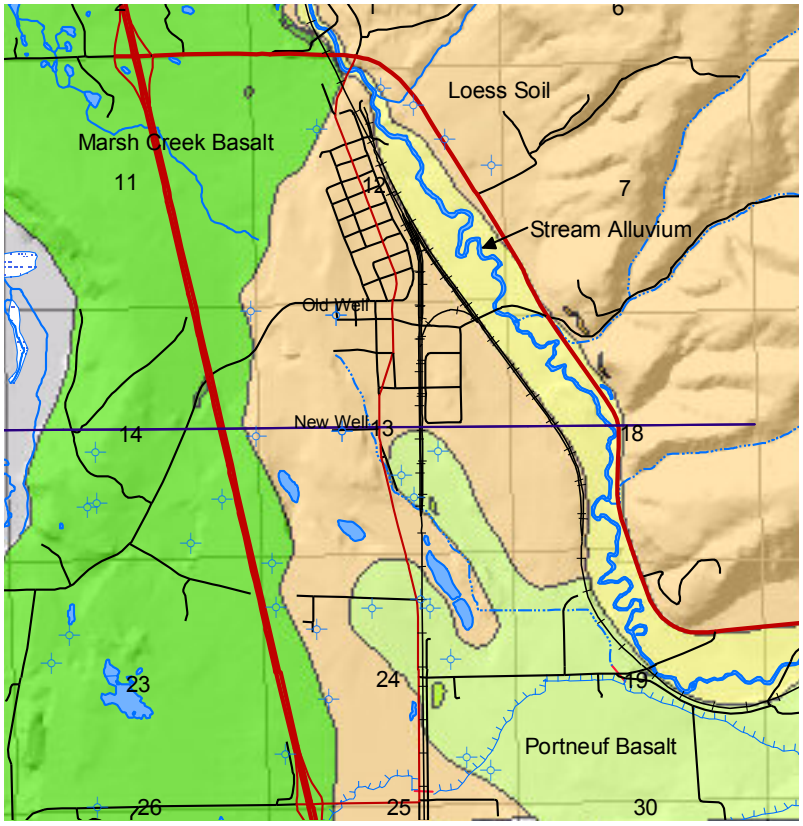


Figure 2 - Geologic map of the McCammon area.

PROJECT AREA HYDROGEOLOGY

Logs from wells near McCammon indicate that several gravel aquifers are available for ground water development. Most of the domestic wells in this area penetrate a gravel aquifer approximately 80 to 100 ft below land surface (Figure 3). These wells yield an average of less than 50 gallons per minute (gpm). There

is one anomalous well estimated at 300 gpm, however this well was not pump tested. The Portneuf River recharges the gravels below the Portneuf River basalts while Marsh Creek recharges the gravels underlying the Marsh Creek basalts.

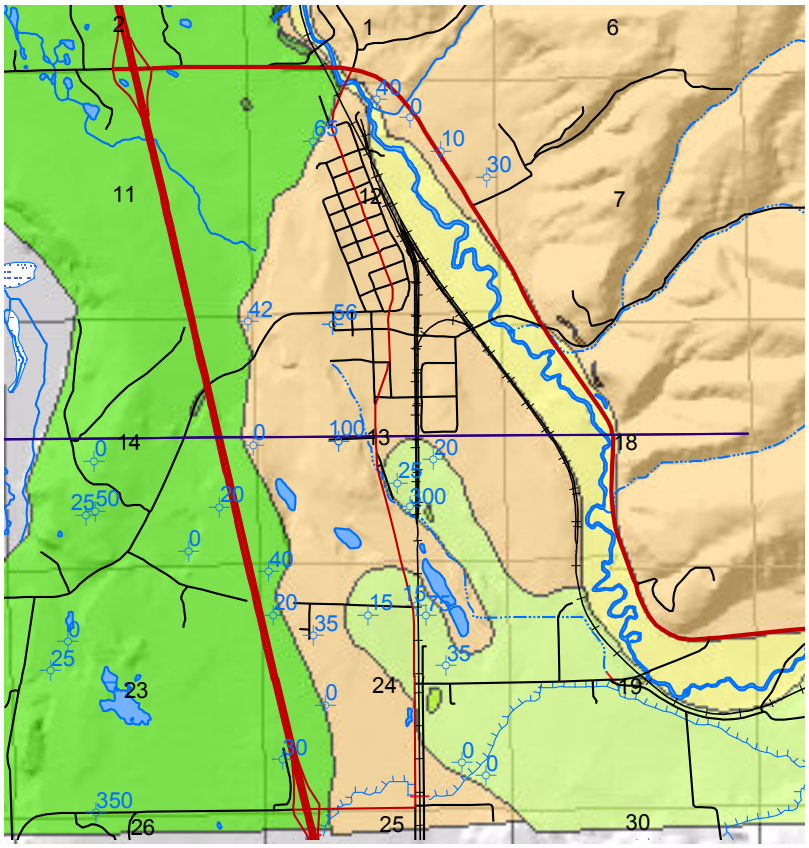


Figure 3 – Well yield data in gpm for the McCammon area.

There are several domestic wells drilled northeast of town and east of the Portneuf River. These wells derive water from a gravel aquifer that underlies a loess horizon and yield an average of less than 20 gpm (Figure 3). Recharge for these gravels likely occurs in the mountains east of the wells.

The town wells obtain their water from a gravel aquifer that is restricted to the valley. A confining blue-clay layer, approximately 385 feet below land surface, lies above the gravel. The New well yields 100 gpm while the Old well produces 50 gpm. The log on file with IDWR for the New well indicates that the driller installed no well screen and filled the well with washed gravels from 385 feet to 425 feet below land surface. Figure 4 shows the water level and geologic correlation between the town wells. The water-table gradient implied by well-water levels suggests recharge likely occurs south of McCammon.

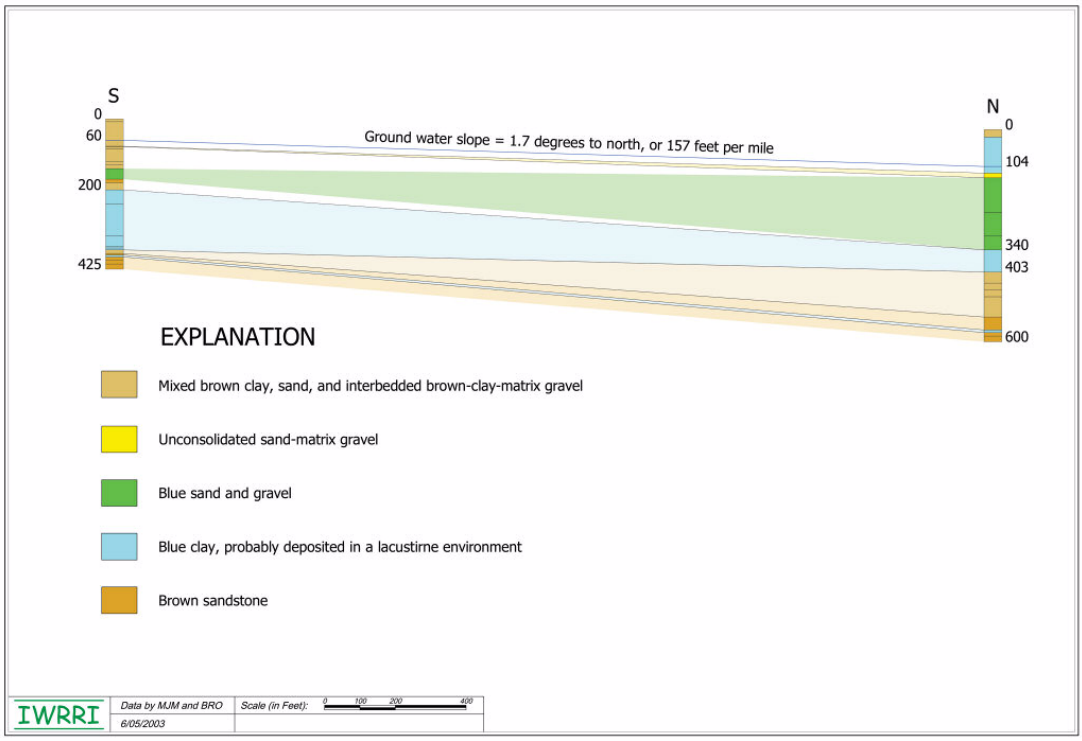


Figure 4 - Geologic correlation and water table for the two town wells.

The New well log shows a completion date of 21 September 2000. Information on file with IDEQ indicates an intention to conduct a sieve analysis and install an engineered well screen. The sieve analysis is dated 7 November 2000 suggesting the driller completed the New well without a screen. Rather than installing a screen the driller completed the well by filling it below 385 ft with washed gravels. The old well log also indicates it was completed without a screen. Well logs and sand analysis data are found in the appendices.

Spring Analysis

The town spring is a diversion from Crystal Springs, located approximately 3.5 miles from the storage tank along the boundary of Caribou National Forest (CNF). The spring derives water from a limestone aquifer. Recharge occurs from higher elevations within the CNF.

McCammon's water right allows 1.2 cubic feet per second or 540 gpm from the estimated 1600 gpm of the springs (Jaglowski, 2003; IDWR, 2003). Table 1 shows the water use per day and per person per day calculated from the water right. The 960 gallons per capita per day (gcd) is approximately 10 times the average water use of 80 gcd to 100 gcd indicated from USGS data (USGS, 2003). The 540 gpm from Crystal Springs supplies more than enough to meet the USGS average volume. There is also only one other claim or diversion of 0.02 cfs currently recommended from Crystal Springs. The total diversion volume from Crystal Springs is 1.22 cfs or 578 gpm.

Table 1 - McCammon water use calculations. [1] Jaglowski, 2003 and , 2003, [2] based on a population of 805 from the US Bureau of the Census, 2001.

McCammon Water Right[1] [cfs], [gpm]	Volume per day [gpd]	Volume per capita per day[2] [gcd]
1.2,540	776000	960

DISCUSSION OF RESULTS

Well yield data are sparse for the McCammon area. Data for the gravel aquifer below the loess northeast of town shows poor yields. The gravel aquifer below the basalt lava flows also shows low yields. This aquifer has some potential but the yield data do not show much more than 50 gpm. The gravel penetrated by the town wells is the most promising aquifer. The New and Old wells yield 100 gpm and 50 gpm respectively, greater than most wells in the area.

Both wells lack a well screen, thus the occurrence of sand. Conflicting data described on the log of the New well and the sand analysis implies that it does not have a well screen. The log of the Old well similarly indicates the driller and engineer did not install a screen. A properly designed well screen prevents sand from entering the well.

The existing sand analysis for the New well provides the necessary data to design a proper screen for the well. The town can still use the well by drilling out the washed gravel and installing a screen as designed in November 2000. Unfortunately there are no sand analysis data for the Old well. We advise against sizing a screen for the Old well based on the New well sieve analysis because seemingly minor changes in flow regime can result in significant changes in size fraction curves. Thus, the Old well will have to be replaced by drilling a third well.

The water right from Crystal Springs appears to provide an adequate amount of water (Table 1). Several scenarios may explain McCammon's above average water use. The spring diversion may not divert the allotted 540 gpm. Therefore 970 gcd is an over estimate and not actually used by the town. Alternately, water could be lost through leakage in the pipelines. Pipeline leakage could occur between the diversion and tank, tank and distribution systems, or within the distribution system. Again, leaks in the pipelines result in over estimating water use. The final scenario is simply excessive water use. Residents may be using abnormally high amounts of water.

CONCLUSIONS AND RECOMMENDATIONS

We recommend that the town use the New well and drill another to replace the Old well. These wells will obtain water from the gravel aquifer below the confining blue-clay layer.

The New well has conflicting data with regards to a screen. Completion and sand analysis dates, washed gravels, and presence of sand in the water imply the well is without a screen. We recommend removing the pump from the well and then video logging the well to determine whether or not a screen was installed.

The presence of a screen implies that the screen was improperly designed and allows sand to enter the well. In this case, we would recommend abandoning the well and drilling a new one. The new well should penetrate the gravels below the blue-clay layer. Samples should also be taken to design a properly sized screen.

If a screen is not present, the town can utilize the sand analysis data to size a screen for the New well. They should drill out the gravels that fill the bottom of the well and install a properly engineered screen that will prevent sand from entering the well.

We also recommend drilling another well to replace the Old well. Possible locations include the fenced area next to the school playground or the park west of the school. The well should reach a depth below the blue confining layer, approximately 515 feet below ground surface. A geologist should log the drill cuttings and collect samples while drilling. Then an engineer can properly size a screen for the well. Installation of a properly engineered screen will assure sand-free water.

There are no temporal water level data. Thus we recommend the town instrument the wells with water-level measuring devices. This will help determine the long-term viability of the aquifer.

The combination of two wells will only provide approximately 200 gpm and not fulfill the town engineers' request of 800 gpm. There are two options to meet this requirement. These alternatives are to drill additional wells or investigate the spring diversion. The low yield data in the area implies that numerous wells will be needed to meet the 800 gpm requirement.

We recommend inspecting the spring diversion. Table 1 suggests an adequate supply of water from Crystal Springs. Thus the town should verify a 540 gpm diversion and determine possible leaks in the pipeline. Leaks may occur between the diversion and tank, tank and distribution system, or within the distribution system. Verifying the 540 gpm and determining possible pipeline leakage will help better understand how much water the town uses and needs. In addition, water rights data suggest applying for more water is available. We also recommend the town apply for additional water from the spring to supplement the current volume claimed.

REFERENCES

Jaglowski, Michael. “Re: mccammon question.” E-mail to Mike Martin. 11 June 2003.

IDWR. “IDWR Water Right and Adjudication Search.” IDWR Water Rights Page. 12 June 2003 <http://www.idwr.state.id.us/water/rights/default.htm>.

Otto, B.R., A.H. Wylie, and M.J. Martin. 2003. Hydrogeologic Analysis of the Water Supply for the Town of Lava Hot Springs, Bannock County, Idaho. Idaho Water Resources Research Institute Research Report.

US Bureau of the Census. 2001. Population of Idaho Cities, 1990 – 2000.

USGS. “Water Q&A: Water Use at Home.” USGS Water Science for School Page. 23 June 2003. <http://ga.water.usgs.gov/edu/qahome.html>.

U.S. Fish & Wildlife Service
ECOS

ECOS / Species Reports / Species County Report

Listed species believed to or known to occur in Bannock, Idaho

The following report contains Species that are known to or are believed to occur in this county. Species with range unrefined past the state level are now excluded from this report. If you are looking for the Section 7 range (for Section 7 Consultations), please visit theIPaC application.

CSV

Search:

5 Species Listings

Group	Name	Population	Status	Lead Office	Recovery Plan	Recovery Plan Action Status
Mammals	North American wolverine (Gulo gulo luscus)	Wherever found	Proposed Threatened	6		
Flowering Plants	Ute ladies'-tresses (Spiranthes diluvialis)	Wherever found	Threatened	6	Ute Ladies'-Tresses Draft Recovery Plan	Implementation Progress
Snails	Utah valvata snail (Valvata utahensis)	Wherever found	Original Data in Error - New Information Discovered	1		
Birds	Yellow-billed Cuckoo (Coccyzus americanus)	Western DPS: U.S.A. (AZ, CA, CO (western), ID, MT (western), NM (western), NV, OR, TX (western), UT, WA, WY (western)); Canada (British Columbia (southwestern); Mexico (Baja California, Baja California Sur, Chihuahua, Durango (western), Sinaloa, Sonora)	Threatened	2		
Mammals	Gray wolf (Canis lupus)	Northern Rocky Mountain Distinct Population Segment: Montana, Idaho, Wyoming, eastern Washington, eastern Oregon, and north central Utah	Recovery	6		

Showing 1 to 5 of 5 entries

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Scientific Name	County	Federal T/E Status
Astragalus eremiticus		
Astragalus ampullarioides		Endangered
Howellia aquatilis		T
Mirabilis macfarlanei		T

Time Generated: 01/10/2020 09:51 AM CST

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

Provisionally Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations by June 26, 2009. If the community or owner does not provide the necessary data and documentation or if the data and documenation provided indicate the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 12. The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713 3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. This information was compiled from Bannock County (2006), the Columbia Basin Project (1996), Idaho Department of Water Resources (2003), Idaho Geospatial Data Clearinghouse (2006), National Geodetic Survey (2006), City of Pocatello (2004), and the USDA-FSA (2004) at a scale of 1:24,000.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Idaho State Plane East Zone (FIPS Zone 1101), Transverse Mercator projection
- 4689000mN — 1000-meter Universal Transverse Mercator grid values, zone 12N
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
JULY 7, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0514D

FIRM

FLOOD INSURANCE RATE MAP

BANNOCK COUNTY, IDAHO AND INCORPORATED AREAS

PANEL 514 OF 925
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BANNOCK COUNTY	160009	0514	D
MCCAMMON, CITY OF	160176	0514	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
16005C0514D
EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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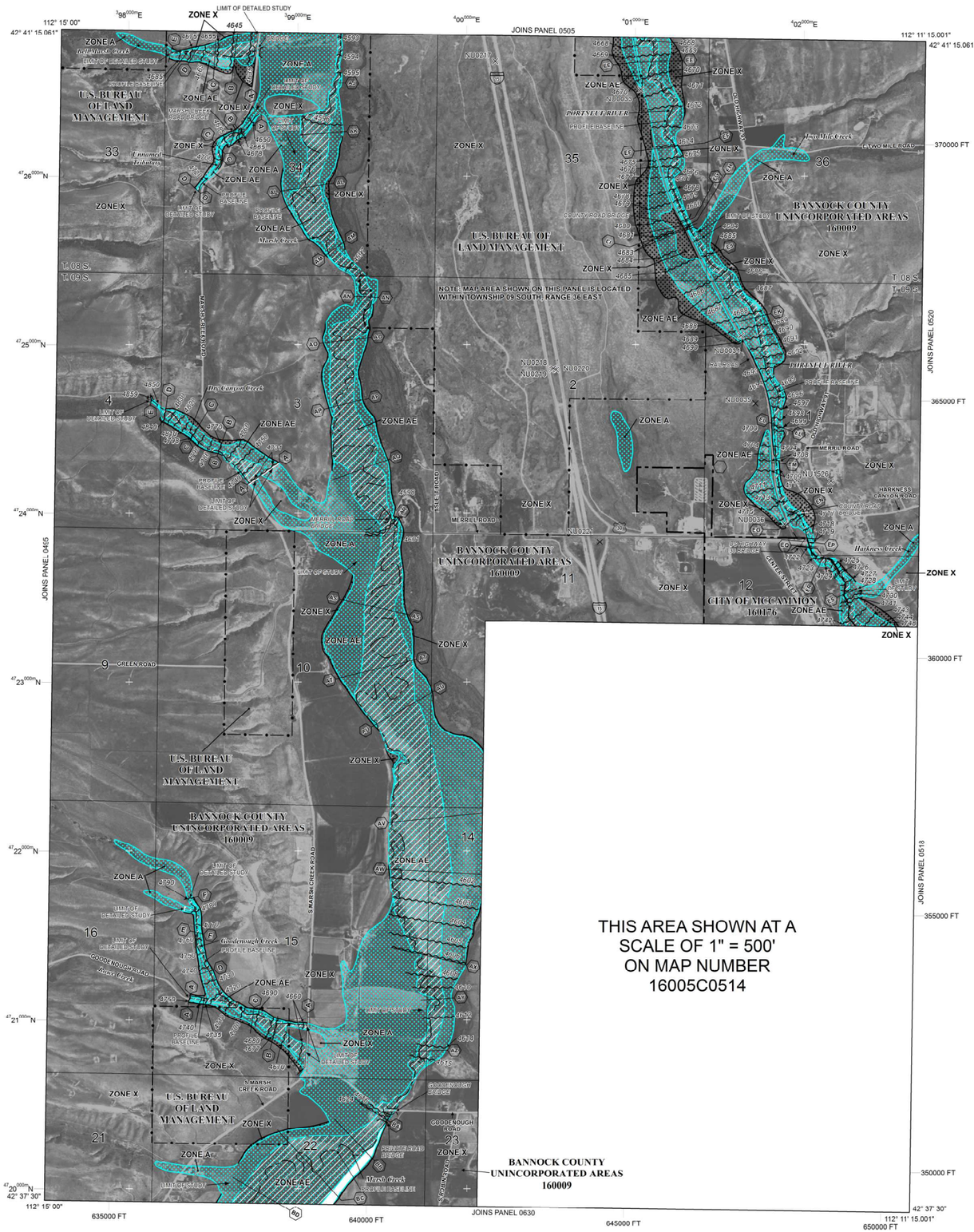
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Idaho State Plane East zone (FIPS zone 1101), Transverse Mercator projection
- 89°00'00" N — 1000-meter Universal Transverse Mercator grid values, zone 12N
- DX5610 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
JULY 7, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0515D

FIRM

FLOOD INSURANCE RATE MAP

BANNOCK COUNTY, IDAHO AND INCORPORATED AREAS

PANEL 515 OF 925
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BANNOCK COUNTY	160009	0515	D
MCCAMMON, CITY OF	160176	0515	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
16005C0515D
EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

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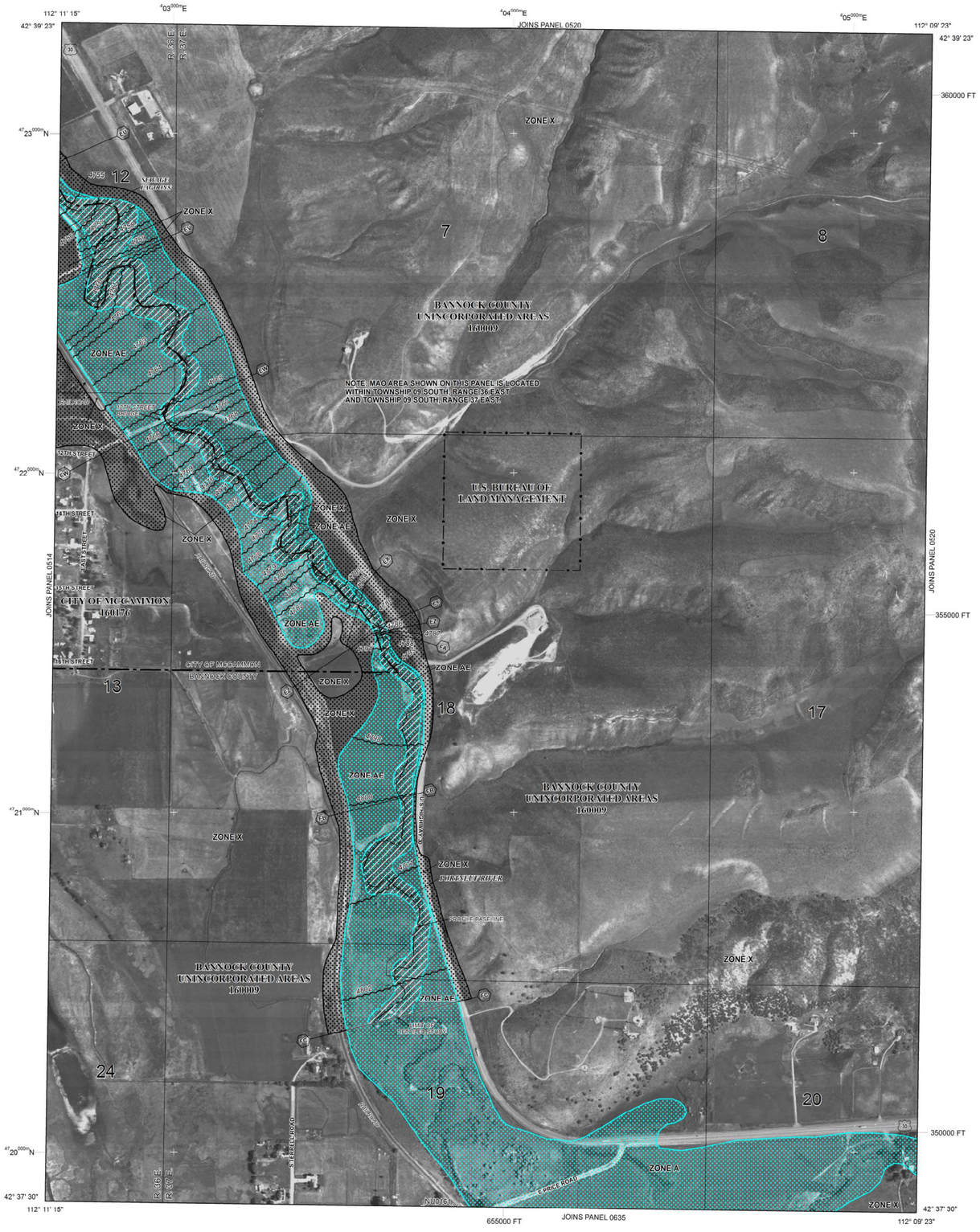

LEGEND

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250 0 500 1000 FEET
150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0518D

FIRM

FLOOD INSURANCE RATE MAP

BANNOCK COUNTY, IDAHO AND INCORPORATED AREAS

PANEL 518 OF 925
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BANNOCK COUNTY	160009	0518	D
MCCAMMON, CITY OF	160176	0518	D

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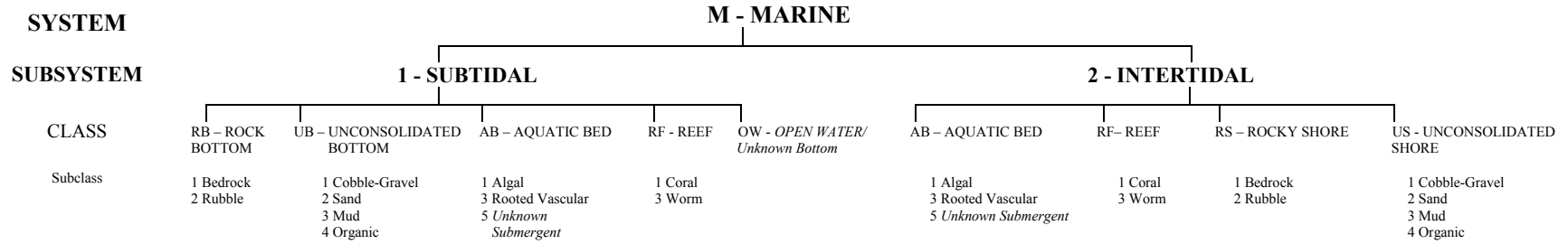
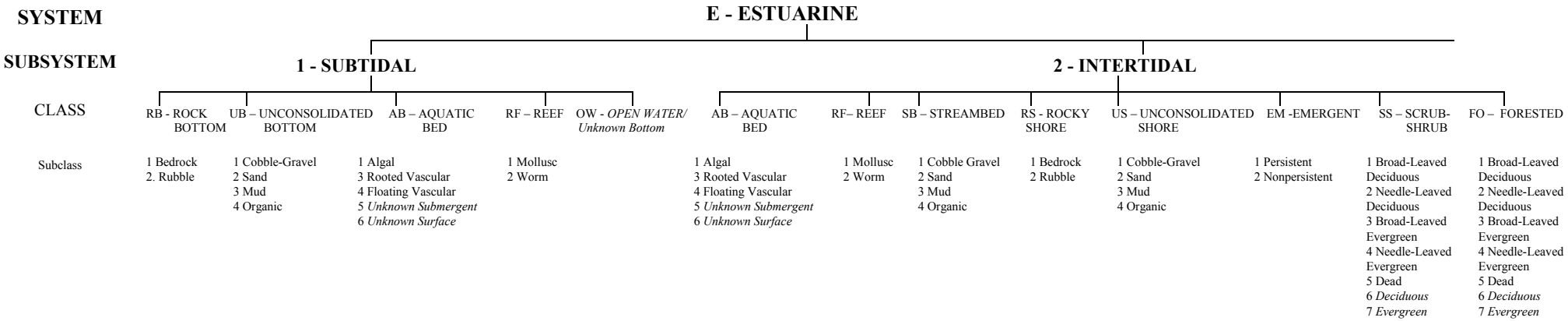
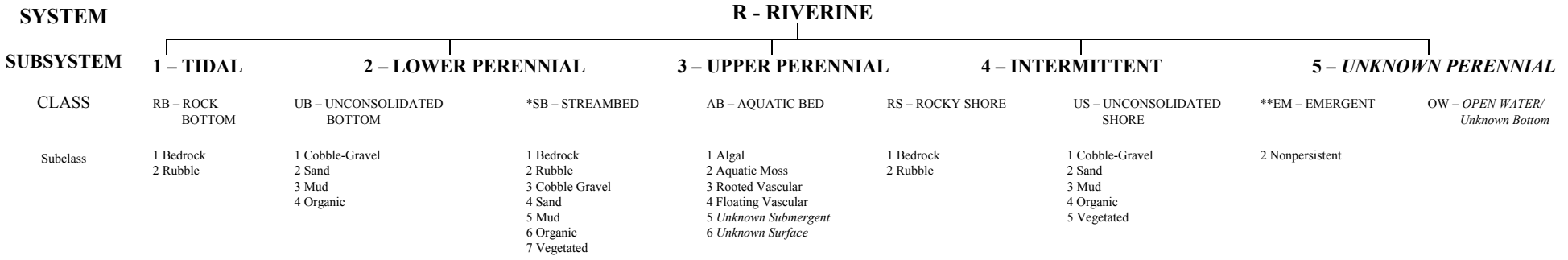
MAP NUMBER
16005C0518D
EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION







* STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.
** EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS.

Classification of Wetlands and Deepwater Habitats of the United States
Cowardin ET AL. 1979 as modified for National Wetland Inventory Mapping Convention

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

SYSTEM — **L- LACUSTRINE**

SUBSYSTEM

	1 - LIMNETIC				**2 - LITTORAL**						
CLASS	RB – ROCK BOTTOM	UB – UNCONSOLIDATED BOTTOM	AB – AQUATIC BED	OW – *OPEN WATER/ Unknown Bottom*	RB – ROCK BOTTOM	UB – UNCONSOLIDATED BOTTOM	AB – AQUATIC BED	RS – ROCKY SHORE	US – UNCONSOLIDATED SHORE	EM – EMERGENT	OW – *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2. Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*		1 Bedrock 2. Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2. Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

SYSTEM — **P - PALUSTRINE**

CLASS	RB – ROCK BOTTOM	UB – UNCONSOLIDATED BOTTOM	AB – AQUATIC BED	US – UNCONSOLIDATED SHORE	ML – MOSS-LICHEN	EM – EMERGENT	SS – SCRUB-SHRUB	FO – FORESTED	OW – *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2. Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	

MODIFIERS

In order to more adequately describe the wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non-Tidal

- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ Well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded/Temporary
- Y Saturated/Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal

- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Exposed
- P Irregularly Flooded
- *S Temporary-Tidal
- *R Seasonal-Tidal
- *T Semipermanent-Tidal
- *V Permanent-Tidal
- U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity	**Inland Salinity**	**pH Modifiers for all Fresh Water**
1 Hyperhaline	7 Hypersaline	
2 Euthaline	8 Eusaline	a Acid
3 Mixohaline *(Brackish)*	9 Mixosaline	t Circumneutral
4 Polyhaline	0 Fresh	i Alkaline
5 Mesohaline		
6 Oligohaline		
0 Fresh		

SOIL

- g Organic
- n Mineral

SPECIAL MODIFIERS

- b *Beaver*
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

NOTE: Italicized terms were added for mapping by the National Wetlands Inventory program.

City of McCammon

802 Front Street * * PO BOX 9
McCammon, ID 83250

Drinking Water Report***2018 Sampling Results

This is our **annual Consumer Confidence Report (CCR)** on your drinking water system. The most recently required sampling results have been gathered to inform customers about their tap water. With this information, we hope you will learn more about your water and will help protect the water for future use.

We provide quality drinking water that meets all federal and state requirements.

During recent years we have sampled many different chemicals for contamination. Contamination is anything other than pure water. We sample total coliform bacteria as an indicator of microorganisms (bacteria, viruses and other small creatures) that should not be present. **The table below lists all the drinking water contaminants that we detected during the past calendar year or in our most recent tests as noted.** Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate a health risk. More information about contaminants and potential health effects can be obtained by calling **208-254-3200** or **U.S. Environmental Protection Agency's (EPA's) Safe Drinking Water Hotline (1-800-426-4791). EPA's website is www.epa.gov/safewater.**

Terms and Abbreviations

Maximum Contaminant Level Goal (**MCLG**): the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. **IDEAL GOAL**

Maximum Contaminant Level (**MCL**): the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology. **HIGHEST LEVEL ALLOWED**

Action Level (**AL**): the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. **na**: not applicable **nd**: not detectable at testing limit **ppm**: parts per million or milligrams per liter (1 drop in 1 million gallons) **ppb**: parts per billion or micrograms per liter (1 drop in 1 billion gallons) **pCi/L**: picocuries per liter (a measure of radiation).

Regulated Contaminant	MCLG	MCL	Our Water	Sample Date	Exceedance/ Violation	Typical Source of Contaminant
Gross Alpha (pCi/L)	0	15	0.484	8-18-16	No	Naturally occurring
Uranium (pCi/L)	0	30	0.19	5-16-16	No	Naturally occurring
Lead (ppb)	0	15AL	2.0	8-31-17	No	Corrosive water & home plumbing
Copper (ppm)	1.3	1.3AL	0.042	8-31-17	No	Corrosive water & home plumbing
Fluoride (ppm)	4	4	0.20	4-4-16	No	Naturally occurring
Barium (ppm)	2	2	0.209	4-4-16	No	Naturally occurring

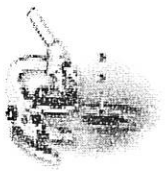
WE HAD NO VIOLATIONS!

Your drinking water comes from ground water primarily from Crystal Springs located eight miles east of the city and our main Well #1. The water from the springs flows down into a 300,000-gallon storage reservoir. The spring water is chlorinated with liquid chlorine at the reservoir.

SOURCE WATER ASSESSMENT

The State of Idaho has completed this assessment plan which includes a map of where the water comes from, possible sources of contamination, and a review of the susceptibility of the source for contamination. This plan is available for public review.

Sources of drinking water: both tap water and bottled water originate as "surface water" from rivers and lakes or as "ground water" from springs and wells. As water travels over the surface of land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material. Water picks up wastes from both human and animal activities. Surface water is usually filtered and disinfected to remove bacteria, viruses, and protozoa. Ground water is usually filtered naturally.



Contaminants that may be present include:

Microbial contaminants such as bacteria, viruses, and protozoa are very small living creatures that may be natural and harmless or harmful if originating from septic systems, agricultural livestock operations or wildlife.

Inorganic contaminants such as heavy metals can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges.

Pesticides and herbicides may come from agriculture and residential uses.

Radioactive contaminants are naturally occurring.

Organic chemical contaminants are usually man-made (synthetic) and vaporize easily (volatile). Petroleum products and degreasers are examples of gas station and dry cleaner waste transported by storm water and sewers.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

EPA ensures that tap water is safe to drink by writing regulations that limits both natural and man-made contaminants. We follow both state and federal regulations. Interstate bottled water is regulated by the U.S. Food and Drug Administration.

HEALTH TIP

If present, elevated levels of **lead** can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Our system is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. **When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking.** If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods & steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or http://www.epa.gov/safewater/lead.

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CITY COUNCIL MONTHLY MEETINGS

2nd Wednesday***7:00 p.m.**City Hall

PLEASE FEEL FREE TO PARTICIPATE

If you have any questions or in emergencies please call:
Sherri Bordeaux or Rich Pierson
208-254-3200

City of McCammon

802 Front Street * * PO BOX 9
McCammon, ID 83250

Drinking Water Report***2019 Sampling Results

This is our **annual Consumer Confidence Report (CCR)** on your drinking water system. The most recently required sampling results have been gathered to inform customers about their tap water. With this information, we hope you will learn more about your water and will help protect the water for future use.

We provide quality drinking water that meets all federal and state requirements.

During recent years we have sampled many different chemicals for contamination. Contamination is anything other than pure water. We sample total coliform bacteria as an indicator of microorganisms (bacteria, viruses and other small creatures) that should not be present. **The table below lists all the drinking water contaminants that we detected during the past calendar year or in our most recent tests as noted.** Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate a health risk. More information about contaminants and potential health effects can be obtained by calling **208-254-3200** or **U.S. Environmental Protection Agency's (EPA's) Safe Drinking Water Hotline (1-800-426-4791). EPA's website is www.epa.gov/safewater.**

Terms and Abbreviations

Maximum Contaminant Level Goal (**MCLG**): the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. **IDEAL GOAL**

Maximum Contaminant Level (**MCL**): the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology. **HIGHEST LEVEL ALLOWED**

Action Level (**AL**): the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. **na**: not applicable **nd**: not detectable at testing limit **ppm**: parts per million or milligrams per liter (1 drop in 1 million gallons) **ppb**: parts per billion or micrograms per liter (1 drop in 1 billion gallons) **pCi/L**: picocuries per liter (a measure of radiation).

Regulated Contaminant	MCLG	MCL	Our Water	Sample Date	Exceedance/ Violation	Typical Source of Contaminant
Gross Alpha (pCi/L)	0	15	0.484	8-18-16	No	Naturally occurring
Uranium (pCi/L)	0	30	1.77	8-6-19	No	Naturally occurring
Lead (ppb)	0	15AL	2.0	8-31-17	No	Corrosive water & home plumbing
Copper (ppm)	1.3	1.3AL	0.042	8-31-17	No	Corrosive water & home plumbing
Fluoride (ppm)	4	4	0.40	8-6-19	No	Naturally occurring
Barium (ppm)	2	2	0.217	9-11-19	No	Naturally occurring
Arsenic (ppb)	0	10	2.0	8-6-19	No	Natural deposits, orchards, glass & electronic production wastes
Chromium (ppb)	100	100	3.0	8-6-19	No	Naturally occurring
Radium 226/228	0	5	0.741	8-6-19	No	Naturally occurring

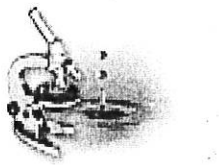
WE HAD NO VIOLATIONS!

Your drinking water comes from ground water primarily from Crystal Springs located eight miles east of the city and our main Well #1. The water from the springs flows down into a 300,000-gallon storage reservoir. The spring water is chlorinated with liquid chlorine at the reservoir.

SOURCE WATER ASSESSMENT

The State of Idaho has completed this assessment plan which includes a map of where the water comes from, possible sources of contamination, and a review of the susceptibility of the source for contamination. This plan is available for public review.

Sources of drinking water: both tap water and bottled water originate as "surface water" from rivers and lakes or as "ground water" from springs and wells. As water travels over the surface of land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material. Water picks up wastes from both human and animal activities. Surface water is usually filtered and disinfected to remove bacteria, viruses, and protozoa. Ground water is usually filtered naturally.



Contaminants that may be present include:

Microbial contaminants such as bacteria, viruses, and protozoa are very small living creatures that may be natural and harmless or harmful if originating from septic systems, agricultural livestock operations or wildlife.

Inorganic contaminants such as heavy metals can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges.

Pesticides and herbicides may come from agriculture and residential uses.

Radioactive contaminants are naturally occurring.

Organic chemical contaminants are usually man-made (synthetic) and vaporize easily (volatile). Petroleum products and degreasers are examples of gas station and dry cleaner waste transported by storm water and sewers.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

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HEALTH TIP

If present, elevated levels of **lead** can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Our system is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. **When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking.** If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods & steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or http://www.epa.gov/safewater/lead.

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CITY COUNCIL MONTHLY MEETINGS

2nd Wednesday***7:00 p.m.**City Hall

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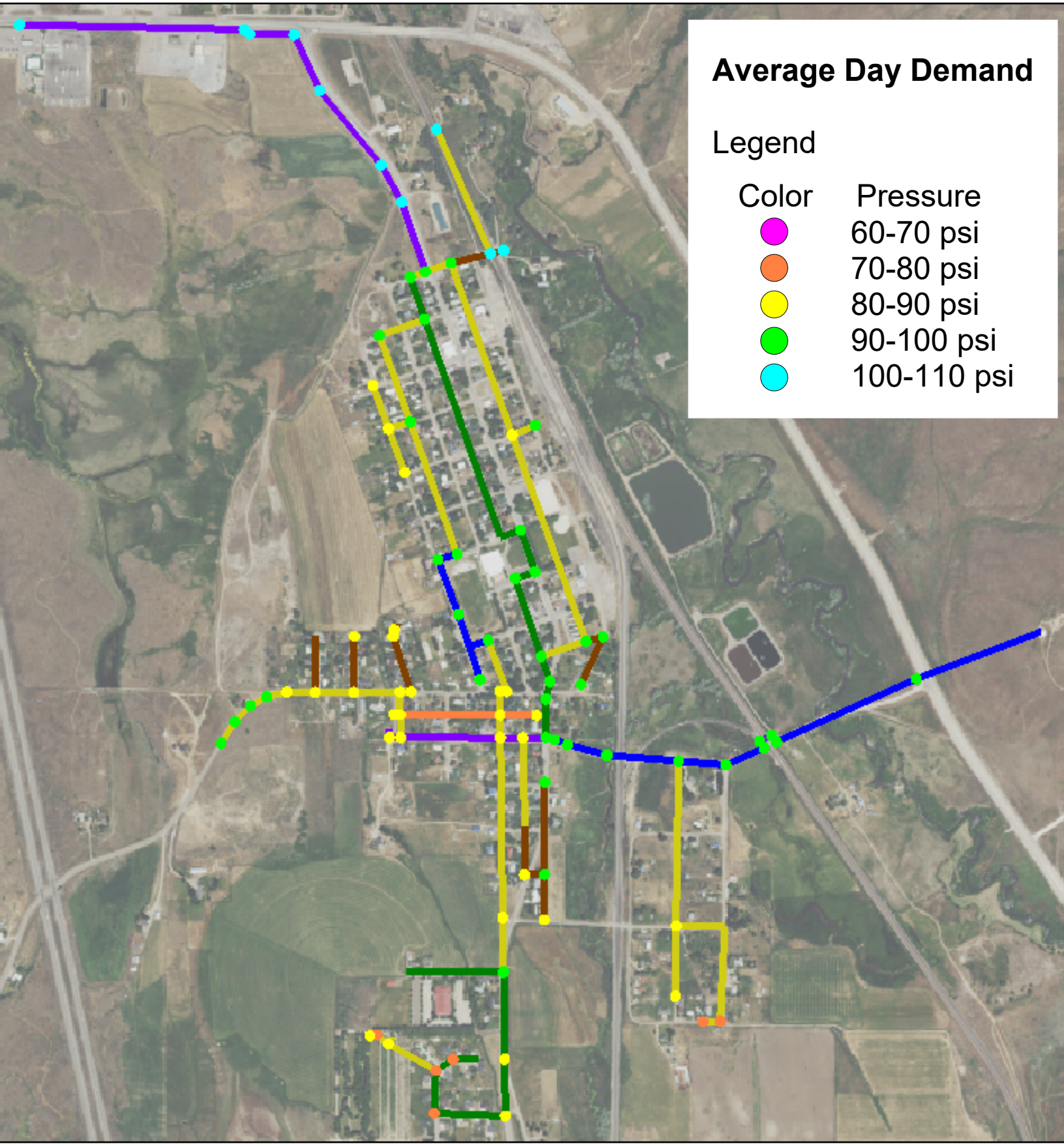
Appendix D: Hydraulic Modeling

- Average Day Demand Pressure Results
- Maximum Day Demand Pressure Results
- Peak Hour Demand Pressure Results


Average Day Demand
Legend
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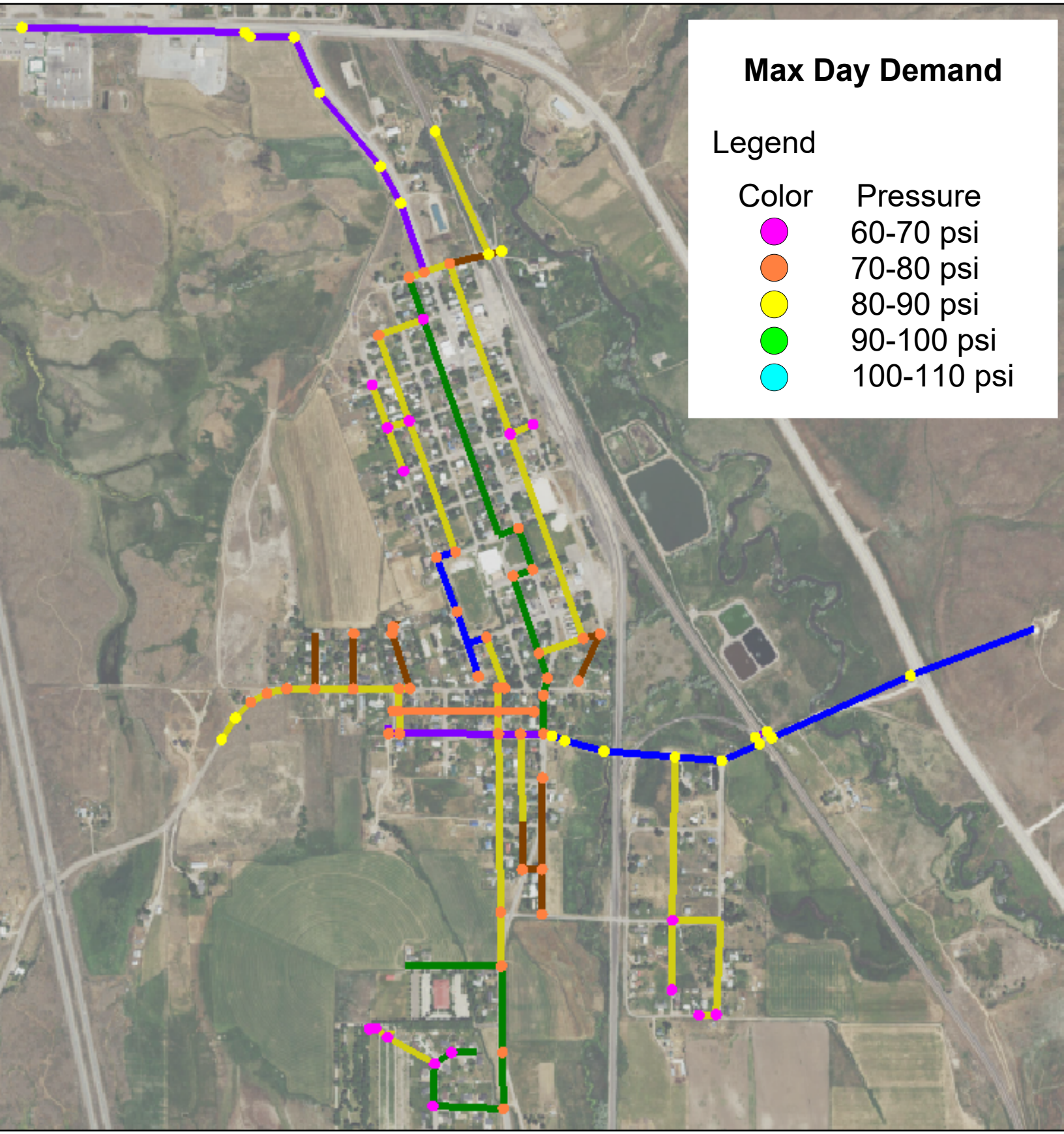
60-70 psi
70-80 psi
80-90 psi
90-100 psi
100-110 psi


Max Day Demand
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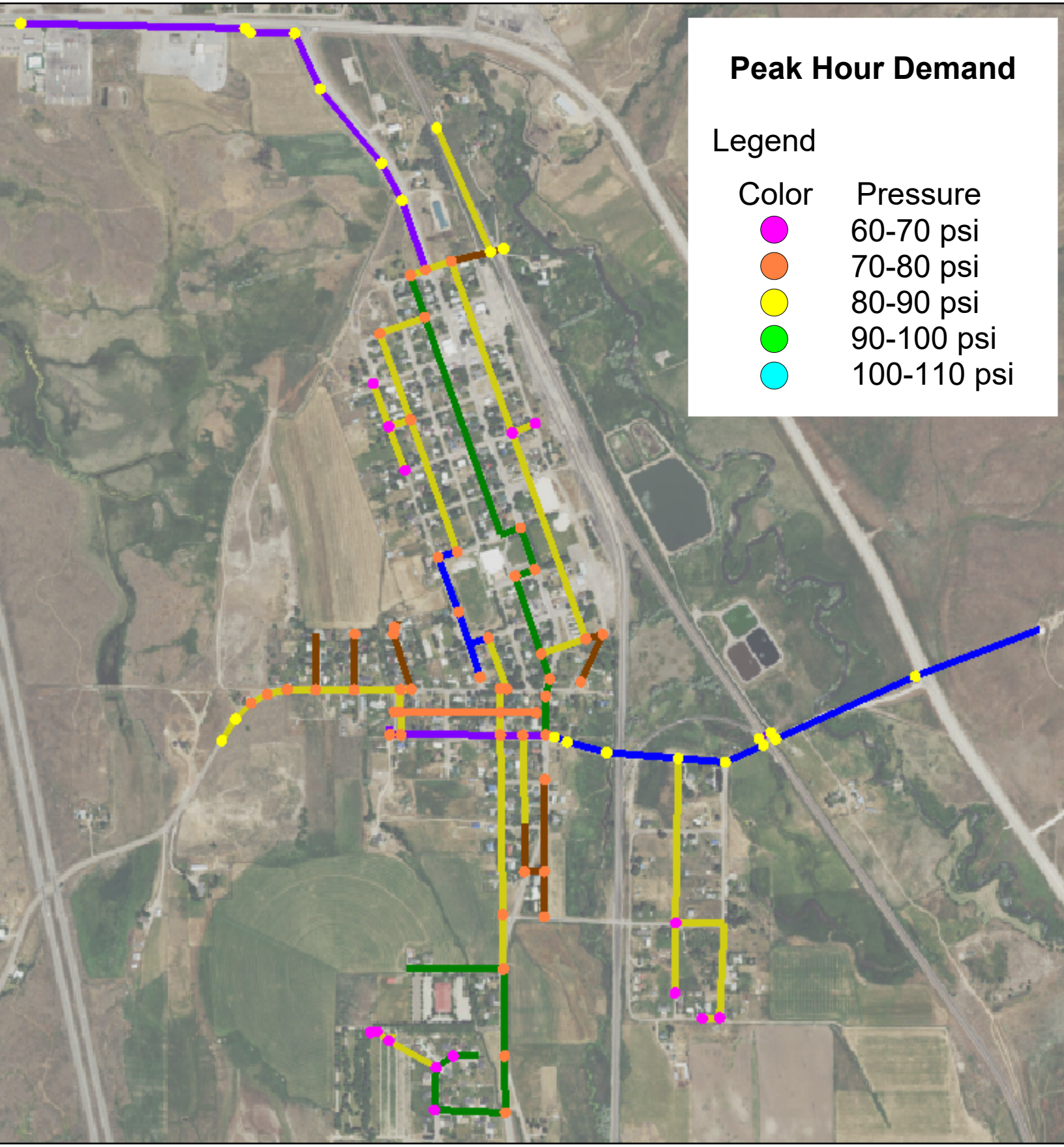
100-110 psi


Peak Hour Demand
Legend
Color
Pressure
60-70 psi
70-80 psi
80-90 psi
90-100 psi
100-110 psi

Appendix E: Alternative Development/Capital Improvement Plan

- Capital Improvement Plan Detail Sheets

ID#	Name	Description	Cost	Cost/EDU/mo.	Services	Need Addressed
1.1	Transmission	Upsize transmission line from tank to the system	$ 1,159,000	$ 9.65	2	Transmission, Fire Flow
1.2	Well #3 Pump	Replace pump and motor to increase production	$ 20,000	$ 0.17	N/A	Increase Firm Capacity by 70 gpm
1.3	Tank #2	1.05 million gallon tank	$ 1,441,000	$ 12.00	N/A	Storage
1.4	Well #4	New well on the north side of the city	$ 150,000	$ 1.25	N/A	Firm Capacity
1.5	Tank #1	Improvements listed in the 2019 tank inspection	$ 158,000	$ 1.32	N/A	Code Requirements
2.1	Center - South	Replace undersized water lines and service lines to the property line. Replace non-working fire hydrants, add hydrants to improve coverage, install meter pits.	$ 369,000	$ 3.07	18	Undersized and Leaking Lines
2.2	State St. - North		$ 126,000	$ 1.05	6	Undersized and Leaking Lines
2.3	Logan St. Loop		$ 274,000	$ 2.28	12	Undersized and Leaking Lines
2.4	State St. - South		$ 294,000	$ 2.45	11	Undersized and Leaking Lines
2.5	16th St.		$ 173,000	$ 1.44	5	Undersized and Leaking Lines
2.6	Center - North		$ 445,000	$ 3.71	38	Undersized and Leaking Lines
2.7	Gear St.		$ 353,000	$ 2.94	13	Undersized and Leaking Lines
2.8	Front St.; 9th to 5th		$ 502,000	$ 4.18	28	Undersized and Leaking Lines
2.9	Front St.; 5th to 1st		$ 333,000	$ 2.77	21	Undersized and Leaking Lines
2.10	11th St.		$ 490,000	$ 4.08	33	Undersized and Leaking Lines
2.11	Townsite Loop		$ 606,000	$ 5.05	25	Undersized and Leaking Lines
2.12	N. RR Extension		$ 229,000	$ 1.91	4	Undersized and Leaking Lines
2.13	Bannock St.		$ 353,000	$ 2.94	29	Undersized and Leaking Lines
2.14	12th St.		$ 173,000	$ 1.44	11	Undersized and Leaking Lines
2.15	Meters	Install remaining water meters	$ 130,000	$ 1.08	55	Water Conservation
3.1	Tank #3	1.05 million gallon tank	$ 1,404,000	$ 11.69	N/A	Storage
		Total Improvements (Not Including Tank #3)	***$ 7,778,000***	***$ 65***	***311***	

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Water Capital Improvements Project

Project Identifier: 1.1 - Transmission

Objectives: Provide fire flow and peak demands to the City. Replacing existing line with 14" PVC until the train tracks, and replacing the rest of the line to Center Street with 12" PVC.

Potential Issues:
- Railroad and canal crossing

Project Location:
12th St. - Hill Tank to Center Street

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
14-inch PVC Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 79	3070	$ 242,530
12-inch PVC Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 72	2700	$ 194,400
1" Service with Surface Repair	EA	$ 2,400	2	$ 4,800
1" Water Meter Pit	EA	$ 1,900	2	$ 3,800
1/2 Lane Pavement Repair	LF	$ 44	3065	$ 134,860
Miscellaneous Surface Repair	LF	$ 5	2705	$ 13,525
Boring	LF	$ 550	320	$ 176,000
Traffic Control - Without Flagging	LF	$ 4	3065	$ 12,260
Subtotal				***$ 782,175***
Mobilization - Percent of Item Cost Sum	%	7%		$ 54,752
Contingency - % of construction costs	%	20%		$ 156,435
Total Construction Costs				***$ 993,362***
Railroad Permit	LS	$ 15,000		$ 15,000
Engineering and CMS	LS	$ 150,000		$ 150,000
Total Project Cost (rounded)	***$1,159,000***			

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Water Capital Improvements Project

Project Identifier: 1.2 - Well #3 Pump

Objectives: Increase firm capacity by replacing pump and motor.

Potential Issues:

Project Location:

Center St. & 1st St.

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
Pump and Motor	LS	$ 16,000	1	$ 16,000
Mobilization - Percent of Item Cost Sum	%	7%		$ 1,120
Contingency - % of construction costs	%	15%		$ 2,400
Total Project Cost (rounded)	***$20,000***			

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Water Capital Improvements Project

Project Identifier: 1.3 - Tank #2

Objectives: Meet half of the 2.1 million gallon storage deficit with a tank capacity of 1.05 million gallons. The flow from the spring is not high enough to warrant the full 2.1 million gallon tank currently.

Potential Issues:
- Connecting to existing tank

Project Location:
Hill Tank Complex

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
1.05 MG Water Storage Tank	LS	$ 960,000	1	$ 960,000
Sitework and Piping	LS	$ 125,000	1	$ 125,000
Chlorination and Overflow Improvements	LS	$ 30,000	1	$ 30,000
Electrical and SCADA	LS	$ 20,000	1	$ 20,000
Subtotal				***$ 1,135,000***
Mobilization - Percent of Item Cost Sum	%	5%		$ 57,000
Total Construction Costs				***$ 1,192,000***
Permitting	LS	$ 10,000		$ 10,000
Engineering and CMS	LS	$ 239,000		$ 239,000
Total Project Cost (rounded)	***$1,441,000***			

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Water Capital Improvements Project

Project Identifier: 1.4 - Well #4

Objectives: Increase firm capacity to reduce dependence on the spring.

Potential Issues:

Project Location:

Center St & 1st St

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
Well Driller Mobilization	LS	$ 10,000	1	$ 10,000
Perforate Casing	HR	$ 400	8	$ 3,200
Well Development/Pump Test	HR	$ 200	40	$ 8,000
Water Quality Testing	LS	$ 2,500	1	$ 2,500
Underground Piping/Connect to Existing	LS	$ 15,000	1	$ 15,000
Pump and Motor	LS	$ 15,000	1	$ 15,000
Pitless Adapter	LS	$ 5,000	1	$ 5,000
Wellhouse Electrical	LS	$ 20,000	1	$ 20,000
Wellhouse Mechanical	LS	$ 15,000	1	$ 15,000
Wellhouse Structure 10'x15'	SF	$ 150	150	$ 22,500
Access Road	SY	$ 20	125	$ 2,500
Subtotal				***$ 95,000***
Mobilization - Percent of Item Cost Sum	%	7%		$ 6,650
Contingency - % of construction costs	%	20%		$ 19,000
Total Construction Costs				***$ 120,650***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 25,000		$ 25,000
Total Project Cost (rounded)	***$150,000***			

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Water Capital Improvements Project

Project Identifier: 1.5 - Tank #1 Improvements

Objectives: Meet OSHA, EPA, NFPA, and AWWA requirements listed in the 2019 tank inspection report

Potential Issues:
- Some improvements require having the tank off line

Project Location:
Hill Tank Complex

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
Electrically grounding tank	LS	$ 5,000	1	$ 5,000
Weld 3/4" bent steel bar handles and galvanized steel bolts on primary shell manway	LS	$ 1,000	1	$ 1,000
Confined space entry sign	EA	$ 500	1	$ 500
Exterior Ladder: Cable safety device, fall protection required sign	LS	$ 1,500	1	$ 1,500
Tank roof 42" handrail with intermediate rail, toeboard, & swing gate	LF	$ 75	90	$ 6,750
30" secondary hatch	LS	$ 4,500	1	$ 4,500
Primary hatch lock and cable safety device	LS	$ 1,500	1	$ 1,500
No trespassing & warning, tampering with this facility is a federal offense signs	LS	$ 500	1	$ 500
Clearing 6" around concrete foundation ring	LS	$ 1,750	1	$ 1,750
Install overflow outlet structure, screen, and adjust pipe for air gap	LS	$ 5,000	1	$ 5,000
Replace level indicator with a float-type level indicator	LS	$ 3,000	1	$ 3,000
Install 18 mesh bug screen on vent	LS	$ 500	1	$ 500
Frost proof drain valve and locking device	LS	$ 20,000	1	$ 20,000
Install angle guides on column base plate	LS	$ 1,200	1	$ 1,200
Mixing system	LS	$ 50,000	1	$ 50,000
Passive cathodic protection system	LS	$ 21,000	1	$ 21,000
Subtotal				***$ 123,700***
Mobilization - Percent of Item Cost Sum	%	5%		$ 7,000
Total Construction Costs				***$ 130,700***
Engineering and CMS	LS	$ 27,000		$ 27,000
Total Project Cost (rounded)	***$158,000***			

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Water Capital Improvements Project

Project Identifier: 2.1 - Center - South

Objectives: Upgrade deteriorating or undersized lines to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

Center St. & Alley - 7th St. to 12th St.

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
12-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 72	1967	$ 141,624
1" Service with Surface Repair	EA	$ 2,400	18	$ 43,200
1" Water Meter Pit	EA	$ 1,900	18	$ 34,200
Traffic Control - Without Flagging	LF	$ 4	357	$ 1,602
Traffic Control - With Flagging	LF	$ 8	870	$ 6,960
1/2 Lane Pavement Repair	LF	$ 44	172	$ 7,742
Gravel Repair	LF	$ 12	740	$ 8,880
Miscellaneous Surface Repair	LF	$ 5	1055	$ 5,275
Subtotal				***$ 249,483***
Mobilization - Percent of Item Cost Sum	%	7%		$ 17,464
Contingency - % of construction costs	%	20%		$ 49,897
Total Construction Costs				***$ 316,843***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 48,000		$ 48,000
Total Project Cost (rounded)	***$369,000***			

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Water Capital Improvements Project

Project Identifier: 2.2 - State St. - North

Objectives: Upgrade deteriorating or undersized lines to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-May be able to share road repair costs with sewer

Project Location:

State St. and Alley - 12th St. to 9th St.

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
8-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 56	849	$ 47,544
1" Service with Surface Repair	EA	$ 2,400	6	$ 14,400
1" Water Meter Pit	EA	$ 1,900	6	$ 11,400
Traffic Control - Without Flagging	LF	$ 4	460	$ 1,840
1/2 Lane Pavement Repair	LF	$ 44	30	$ 1,320
Gravel Repair	LF	$ 12	389	$ 4,668
Miscellaneous Surface Repair	LF	$ 5	430	$ 2,150
Subtotal				***$ 83,322***
Mobilization - Percent of Item Cost Sum	%	7%		$ 5,833
Contingency - % of construction costs	%	20%		$ 16,664
Total Construction Costs				***$ 105,819***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 16,000		$ 16,000
Total Project Cost (rounded)	***$126,000***			

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Water Capital Improvements Project

Project Identifier: 2.3 - Logan St. Loop

Objectives: Upgrade deteriorating or undersized lines and install new lines to:
-Reduce water leakage in the system
-Provide adequate Fire Flow
-Create a loop for better supplying the north end of the City

Potential Issues:
-

Project Location:

Logan St. - 7th St. to 2nd St.; 2nd St. - Logan St. to Center St. Alley

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	2316	$ 108,852
1" Service with Surface Repair	EA	$ 2,400	12	$ 28,800
1" Water Meter Pit	EA	$ 1,900	12	$ 22,800
Traffic Control - Without Flagging	LF	$ 4	2316	$ 9,264
1/2 Lane Pavement Repair	LF	$ 44	70	$ 3,080
Miscellaneous Surface Repair	LF	$ 5	2246	$ 11,230
Subtotal				***$ 184,026***
Mobilization - Percent of Item Cost Sum	%	7%		$ 12,882
Contingency - % of construction costs	%	20%		$ 36,805
Total Construction Costs				***$ 233,713***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 36,000		$ 36,000
Total Project Cost (rounded)	***$274,000***			

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Water Capital Improvements Project

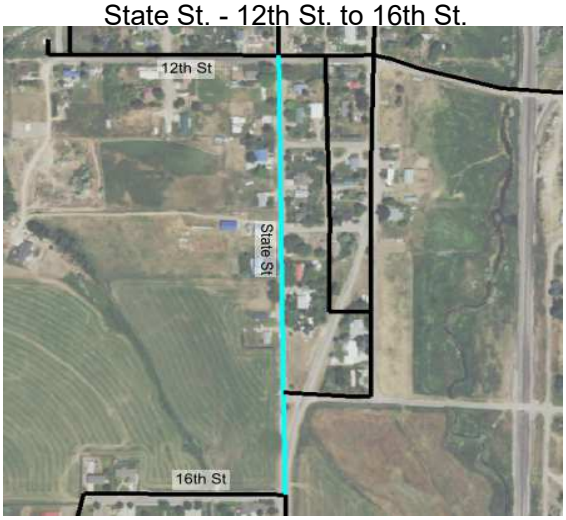
Project Identifier: 2.4 - State St. South

Objectives: Upgrade deteriorating or undersized lines to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

State St. - 12th St. to 16th St.



General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
12-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 72	1851	$ 133,272
1" Service with Surface Repair	EA	$ 2,400	11	$ 26,400
1" Water Meter Pit	EA	$ 1,900	11	$ 20,900
Traffic Control - Without Flagging	LF	$ 4	1422	$ 5,688
Traffic Control - With Flagging	LF	$ 8	215	$ 1,720
1/2 Lane Pavement Repair	LF	$ 44	30	$ 1,320
Miscellaneous Surface Repair	LF	$ 5	1821	$ 9,105
Subtotal				***$ 198,405***
Mobilization - Percent of Item Cost Sum	%	7%		$ 13,888
Contingency - % of construction costs	%	20%		$ 39,681
Total Construction Costs				***$ 251,974***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 38,000		$ 38,000
Total Project Cost (rounded)	***$294,000***			

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Water Capital Improvements Project

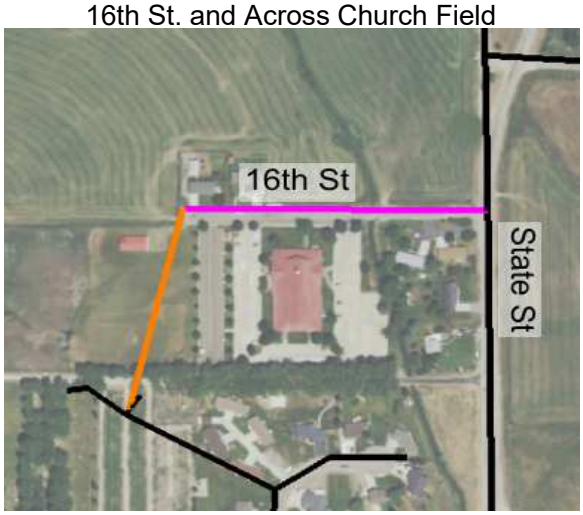
Project Identifier: 2.5 - 16th St.

Objectives: Upgrade deteriorating or undersized lines and install a looping line to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

16th St. and Across Church Field



General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	577	$ 27,119
10-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 64	763	$ 48,832
1" Service with Surface Repair	EA	$ 2,400	4	$ 9,600
1.5" Service with Surface Repair	EA	$ 3,400	1	$ 3,400
1" Water Meter Pit	EA	$ 1,900	4	$ 7,600
1.5" Water Meter Pit	EA	$ 4,100	1	$ 4,100
Traffic Control - Without Flagging	LF	$ 4	763	$ 3,052
Miscellaneous Surface Repair	LF	$ 5	1340	$ 6,700
Subtotal				***$ 110,403***
Mobilization - Percent of Item Cost Sum	%	7%		$ 7,728
Contingency - % of construction costs	%	20%		$ 22,081
Total Construction Costs				***$ 140,212***
Easement	LF	$ 15	430	$ 6,450
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 22,000		$ 22,000
Total Project Cost (rounded)	***$173,000***			

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Water Capital Improvements Project

Project Identifier: 2.6 - Center - North

Objectives: Upgrade deteriorating lines to:
-Provide water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

Center St. Alley - 7th St. to 1st St.

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	2174	$ 102,178
1" Service with Surface Repair	EA	$ 2,400	37	$ 88,800
1.5" Service with Surface Repair	EA	$ 3,400	1	$ 3,400
1" Water Meter Pit	EA	$ 1,900	37	$ 70,300
1.5" Water Meter Pit	EA	$ 4,100	1	$ 4,100
Traffic Control - Without Flagging	LF	$ 4	180	$ 720
1/2 Lane Pavement Repair	LF	$ 44	180	$ 7,920
Gravel Repair	LF	$ 12	1994	$ 23,928
Subtotal				***$ 301,346***
Mobilization - Percent of Item Cost Sum	%	7%		$ 21,094
Contingency - % of construction costs	%	20%		$ 60,269
Total Construction Costs				***$ 382,709***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 58,000		$ 58,000
Total Project Cost (rounded)	***$445,000***			

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Water Capital Improvements Project

Project Identifier: 2.7 - Gear St.

Objectives: Upgrade deteriorating or undersized lines and install looping lines to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

Alley - 12th St. to Center St.; Center St./Gear St. - 12th St. to 15th St.; 15th St. - Gear St. to State St.

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	3009	$ 141,423
1" Service with Surface Repair	EA	$ 2,400	13	$ 31,200
1" Water Meter Pit	EA	$ 1,900	13	$ 24,700
Traffic Control - Without Flagging	LF	$ 4	1099	$ 4,396
Traffic Control - With Flagging	LF	$ 8	755	$ 6,040
1/2 Lane Pavement Repair	LF	$ 44	197	$ 8,668
Miscellaneous Surface Repair	LF	$ 5	1748	$ 8,740
Gravel Repair	LF	$ 12	1064	$ 12,768
Subtotal				***$ 237,935***
Mobilization - Percent of Item Cost Sum	%	7%		$ 16,655
Contingency - % of construction costs	%	20%		$ 47,587
Total Construction Costs				***$ 302,177***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 46,000		$ 46,000
Total Project Cost (rounded)	***$353,000***			

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Water Capital Improvements Project

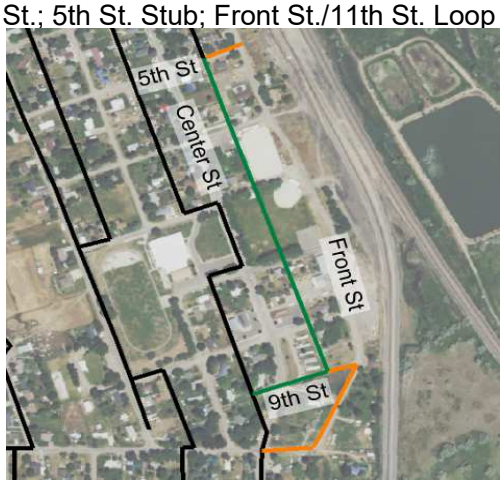
Project Identifier: 2.8 - Front St; 9th to 5th

Objectives: Upgrade deteriorating or undersized lines and install a looping line to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

9th St. - Alley to Front St.; Front St. Alley - 9th St. to 5th St.; 5th St. Stub; Front St./11th St. Loop



General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	1054	$ 49,538
8-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 56	2102	$ 117,712
1" Service with Surface Repair	EA	$ 2,400	24	$ 57,600
1.5" Service with Surface Repair	EA	$ 3,400	4	$ 13,600
1" Water Meter Pit	EA	$ 1,900	24	$ 45,600
1.5" Water Meter Pit	EA	$ 4,100	4	$ 16,400
Traffic Control - Without Flagging	LF	$ 4	1191	$ 4,764
Traffic Control - With Flagging	LF	$ 8	70	$ 560
1/2 Lane Pavement Repair	LF	$ 44	224	$ 9,856
Gravel Repair	LF	$ 12	1498	$ 17,976
Miscellaneous Surface Repair	LF	$ 5	1434	$ 7,170
Subtotal				***$ 340,776***
Mobilization - Percent of Item Cost Sum	%	7%		$ 23,854
Contingency - % of construction costs	%	20%		$ 68,155
Total Construction Costs				***$ 432,786***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 65,000		$ 65,000
Total Project Cost (rounded)	***$502,000***			

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Water Capital Improvements Project

Project Identifier: 2.9 - Front St.; 5th to 1st

Objectives: Upgrade deteriorating or undersized lines to:
-Provide water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

Front St. Alley - 5th St. to 1st St.; 1st St. between Alleys

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
8-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 56	1780	$ 99,680
1" Service with Surface Repair	EA	$ 2,400	18	$ 43,200
1.5" Service with Surface Repair	EA	$ 3,400	3	$ 10,200
1" Water Meter Pit	EA	$ 1,900	18	$ 34,200
1.5" Water Meter Pit	EA	$ 4,100	3	$ 12,300
Traffic Control - Without Flagging	LF	$ 4	377	$ 1,508
Traffic Control - With Flagging	LF	$ 8	48	$ 384
1/2 Lane Pavement Repair	LF	$ 44	134	$ 5,896
Gravel Repair	LF	$ 12	1355	$ 16,260
Miscellaneous Surface Repair	LF	$ 5	291	$ 1,455
Subtotal				***$ 225,083***
Mobilization - Percent of Item Cost Sum	%	7%		$ 15,756
Contingency - % of construction costs	%	20%		$ 45,017
Total Construction Costs				***$ 285,855***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 43,000		$ 43,000
Total Project Cost (rounded)	***$333,000***			

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Water Capital Improvements Project

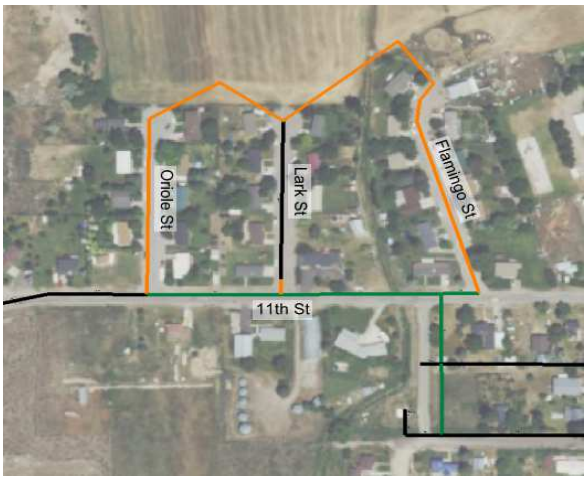
Project Identifier: 2.10 - 11th St.

Objectives: Upgrade deteriorating or undersized lines and install looping lines to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

2nd West, 11th St., Oriole St., Flamingo St., & Loops



General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	1877	$ 88,219
8-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 56	1116	$ 62,496
1" Service with Surface Repair	EA	$ 2,400	33	$ 79,200
1" Water Meter Pit	EA	$ 1,900	33	$ 62,700
Traffic Control - Without Flagging	LF	$ 4	1810	$ 7,240
1/2 Lane Pavement Repair	LF	$ 44	148	$ 6,512
Miscellaneous Surface Repair	LF	$ 5	2844	$ 14,220
Canal Crossing	LS	$ 5,000	1	$ 5,000
Subtotal				***$ 325,587***
Mobilization - Percent of Item Cost Sum	%	7%		$ 22,791
Contingency - % of construction costs	%	20%		$ 65,117
Total Construction Costs				***$ 413,495***
Easement	LS	$ 15	575	$ 8,625
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 63,000		$ 63,000
Total Project Cost (rounded)	***$490,000***			

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Water Capital Improvements Project

Project Identifier: 2.11 - Townsite Loop

Objectives: Upgrade deteriorating or undersized lines and install looping lines to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

Alley - 12th St. to 16th St.; 15th St. &16th St. - 12th St. to East St.; East St. - 12th St. to 16th St.

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	5190	$ 243,930
1" Service with Surface Repair	EA	$ 2,400	25	$ 60,000
1" Water Meter Pit	EA	$ 1,900	25	$ 47,500
Traffic Control - Without Flagging	LF	$ 4	2826	$ 11,304
1/2 Lane Pavement Repair	LF	$ 44	150	$ 6,600
Gravel Repair	LF	$ 12	2364	$ 28,368
Miscellaneous Surface Repair	LF	$ 5	2676	$ 13,380
Subtotal				***$ 411,082***
Mobilization - Percent of Item Cost Sum	%	7%		$ 28,776
Contingency - % of construction costs	%	20%		$ 82,216
Total Construction Costs				***$ 522,074***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 79,000		$ 79,000
Total Project Cost (rounded)	***$606,000***			

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Water Capital Improvements Project

Project Identifier: 2.12 - N. RR Extension

Objectives: Upgrade deteriorating or undersized lines to
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
- Railroad crossings

Project Location:

1st St. - Front St. Alley to End; Along Railroad - 1st St. to End

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	1496	$ 70,312
1" Service with Surface Repair	EA	$ 2,400	4	$ 9,600
1" Water Meter Pit	EA	$ 1,900	4	$ 7,600
Traffic Control - Without Flagging	LF	$ 4	302	$ 1,208
1/2 Lane Pavement Repair	LF	$ 44	40	$ 1,760
Gravel Repair	LF	$ 12	142	$ 1,704
Miscellaneous Surface Repair	LF	$ 5	1214	$ 6,070
Bore Crossing	LF	$ 550	100	$ 55,000
Subtotal				***$ 153,254***
Mobilization - Percent of Item Cost Sum	%	7%		$ 10,728
Contingency - % of construction costs	%	20%		$ 30,651
Total Construction Costs				***$ 194,633***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 30,000		$ 30,000
Total Project Cost (rounded)	***$229,000***			

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Water Capital Improvements Project

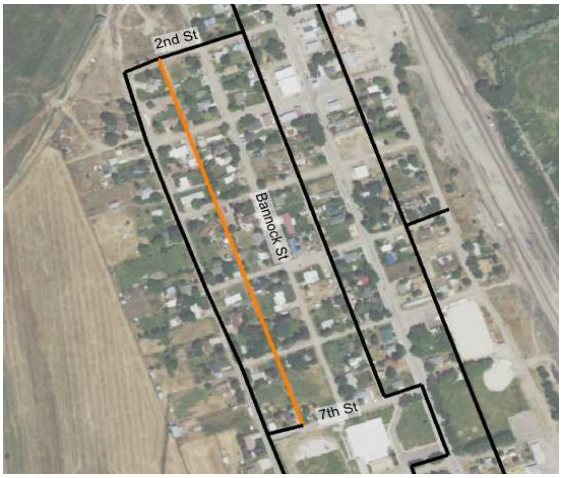
Project Identifier: 2.13 - Bannock St.

Objectives: Upgrade deteriorating or undersized lines to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

Bannock St. Alley - 7th St. to 2nd St.



General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	1832	$ 86,104
1" Service with Surface Repair	EA	$ 2,400	29	$ 69,600
1" Water Meter Pit	EA	$ 1,900	29	$ 55,100
Traffic Control - Without Flagging	LF	$ 4	150	$ 600
1/2 Lane Pavement Repair	LF	$ 44	150	$ 6,600
Gravel Repair	LF	$ 12	1682	$ 20,184
Subtotal				***$ 238,188***
Mobilization - Percent of Item Cost Sum	%	7%		$ 16,673
Contingency - % of construction costs	%	20%		$ 47,638
Total Construction Costs				***$ 302,499***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 46,000		$ 46,000
Total Project Cost (rounded)	***$353,000***			

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Water Capital Improvements Project

Project Identifier: 2.14 - 12th St.

Objectives: Upgrade deteriorating or undersized lines to:
-Reduce water leakage in the system
-Provide adequate Fire Flow

Potential Issues:
-

Project Location:

12th St. Alley - 2nd West to Center St.

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
6-inch Pipe - Excavation, Backfill, Valves, Hydrants	LF	$ 47	1126	$ 52,922
1" Service with Surface Repair	EA	$ 2,400	11	$ 26,400
1" Water Meter Pit	EA	$ 1,900	11	$ 20,900
Traffic Control - Without Flagging	LF	$ 4	42	$ 168
1/2 Lane Pavement Repair	LF	$ 44	42	$ 1,848
Gravel Repair	LF	$ 12	1084	$ 13,008
Subtotal				***$ 115,246***
Mobilization - Percent of Item Cost Sum	%	7%		$ 8,067
Contingency - % of construction costs	%	20%		$ 23,049
Total Construction Costs				***$ 146,362***
Permits	LS	$ 4,000		$ 4,000
Engineering and CMS	LS	$ 22,000		$ 22,000
Total Project Cost (rounded)	***$173,000***			

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Water Capital Improvements Project

Project Identifier: 2.15 - Meters

Objectives: Install meter pits and meters for services on lines not being replaced in other recommended projects

Potential Issues:
-

Project Location:

Remaining Service Lines Throughout City

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
Meters and Meter Pits	EA	$ 5,000	25	$ 125,000
Meters for Services with Existing Meter Pits	EA	$ 250	19	$ 4,750
Total Project Cost (rounded)	***$130,000***			

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Water Capital Improvements Project

Project Identifier: 3.1 - Tank #3

Objectives: Meet the additional storage deficit of 1.05 million gallons.

Potential Issues:
- Connecting to existing tank
- Spring flows high enough to fill all of the hill tanks

Project Location:
Hill Tank Complex

General Line Items	Unit	Unit Price	Estimated Quantity	2020 Cost
1.05 MG Water Storage Tank	LS	$ 960,000	1	$ 960,000
Sitework and Piping	LS	$ 125,000	1	$ 125,000
Electrical and SCADA	LS	$ 20,000	1	$ 20,000
Subtotal				***$ 1,105,000***
Mobilization - Percent of Item Cost Sum	%	5%		$ 56,000
Total Construction Costs				***$ 1,161,000***
Permitting	LS	$ 10,000		$ 10,000
Engineering and CMS	LS	$ 233,000		$ 233,000
Total Project Cost (rounded)	***$1,404,000***			

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Appendix F: Environmental Determination

Will be added after DEQ Environmental Determination is made

Appendix G: Meetings and Public Participation

- 07-08-2020 McCammon City Council Meeting
- 08-12-2020 McCammon City Council Meeting

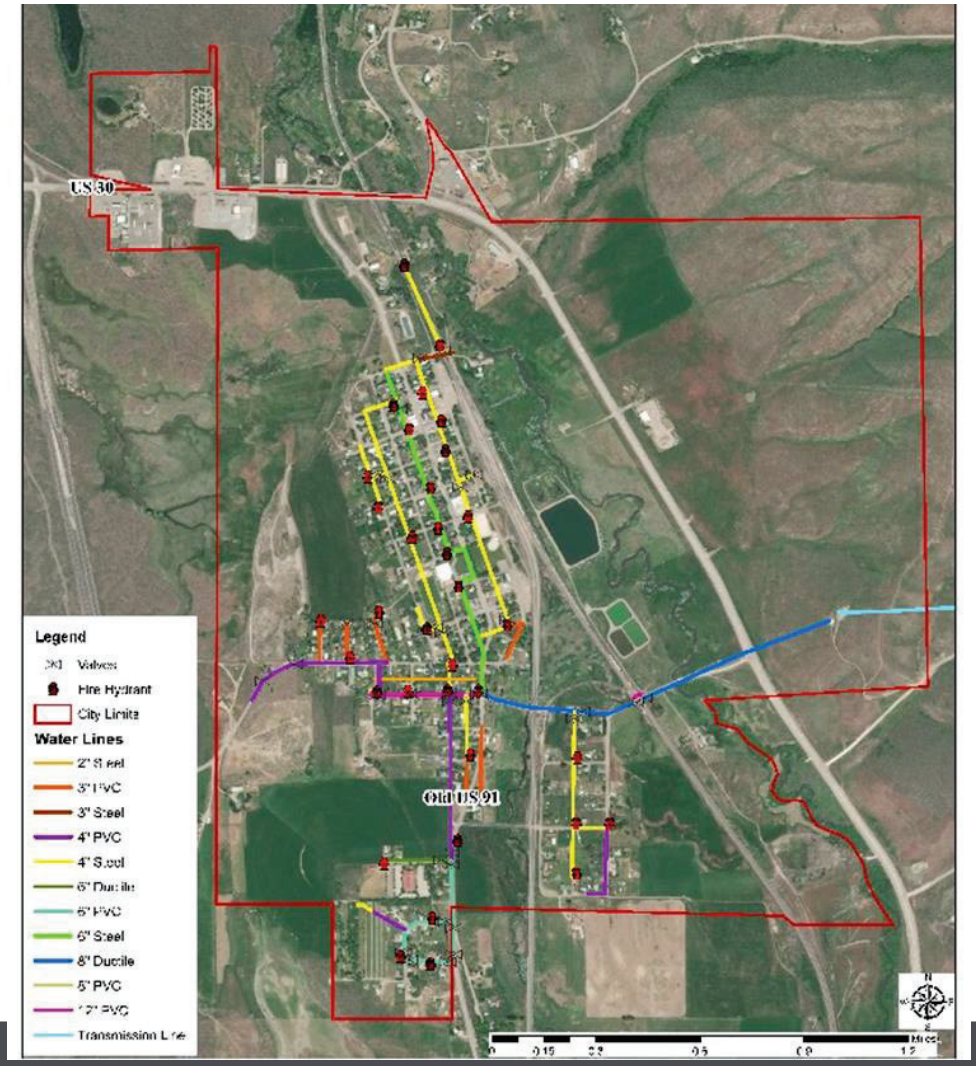
McCammon Water Facilities Planning Study

City Council Presentation

July 8, 2020

KELLER ASSOCIATES

Existing System

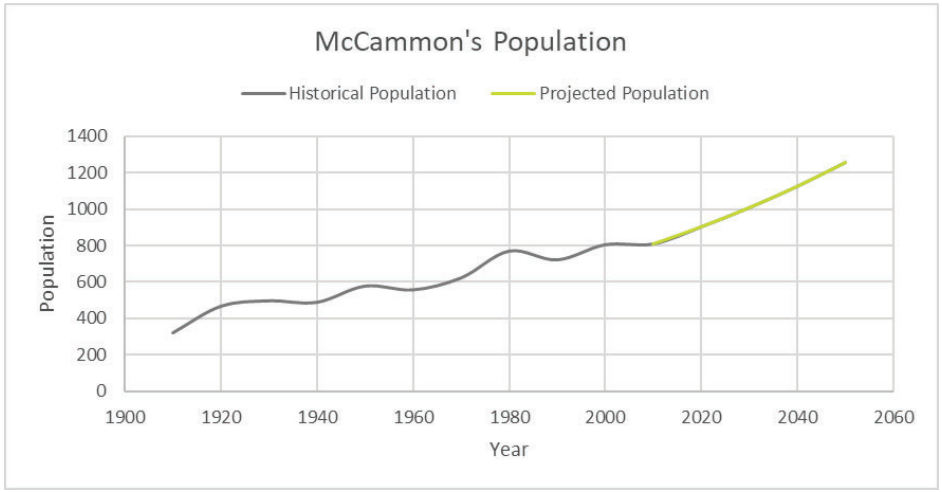


Population/Water Demand Projection

Year	Population	Growth Rate
1950	578	1.67%
1960	557	-0.37%
1970	623	1.12%
1980	770	2.12%
1990	722	-0.64%
2000	805	1.09%
2010	809	0.05%

Year	Forecasted Population	Max Day Demand (gpm)
2020	849	870
2030	947	971
2040	1057	1083
2050	1180	1210

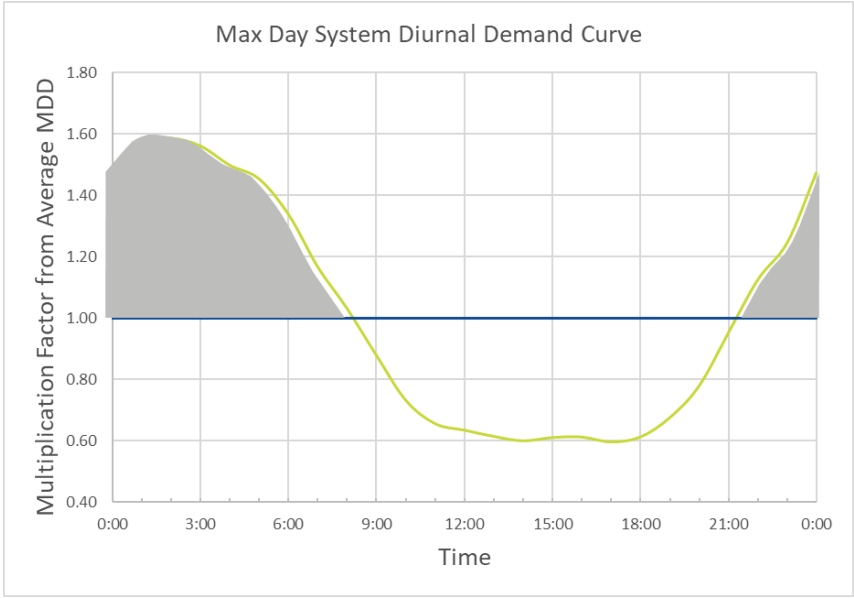
Assumes Per Capita Max Day Usage of 1,476 gallons



Assumed Annual Growth Rate of 1.1%

Design Criteria

- Water Rights – ≥ Maximum Day Demand
- Supply – Firm Capacity ≥ Maximum Day Demand
- Storage
  - Operational
  - Equalization
  - Dead Storage
  - Fire Suppression
- Delivery
  - > 40 psi working pressure
  - > 20 psi during fire



Supply Analysis

Supply vs. Demand

Year	Forecasted Population	Max Day Demand (gpm)	Existing Firm Capacity (gpm)	Surplus/(Deficiency) (gpm)
2020	849	870	300	(570)
2030	947	970	300	(670)
2040	1057	1083	300	(783)

Storage Analysis

Storage Requirement with Decreasing Demand

MDD (gpcd)	2040 (MG, FC=300 gpm)	2040 (MG, FC=500 gpm)
1476 (current)	2.10	1.77
1000	1.52	1.19
500	0.91	0.58

Current and Projected Storage Requirement

Storage Component	2020 (MG)	2040 (MG)
Equalization[1]	0.82	1.13
Fire Suppression[2]	0.96	0.96
Standby[3]	0	0
Subtotal	1.78	2.09
Operational, 10%	0.18	0.21
Dead, 5%	0.09	0.10
Total - Required Storage	2.05	2.40
Available	0.30	0.30
Additional Storage Needed	**1.75**	**2.10**

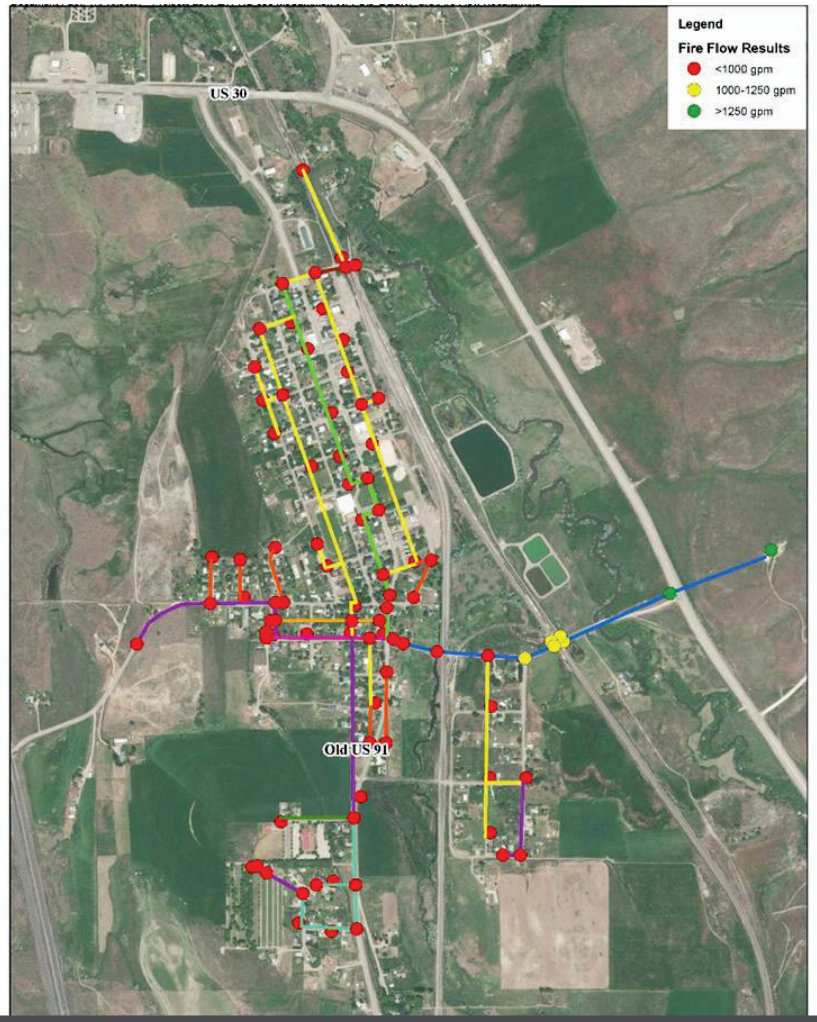
[1]MDD minus Firm Capacity for 24 hrs

[2]Elem. school; 4000 gpm for 4 hours

[3]Spring requires no backup power, fire flow accounted for separately

Fire Flow Analysis

- Target residential fire flow = 1,250 gpm
- Average available fire flow = 384 gpm



Recommended Improvements

- 2 Million Gallons New Storage
- Increase transmission line size from tank to 12th Street
- Replace inoperable fire hydrants
- New well(s)
- Replace undersized lines and glued pvc pipe

□□□

McCammon Water Facilities Planning Study

City Council Presentation

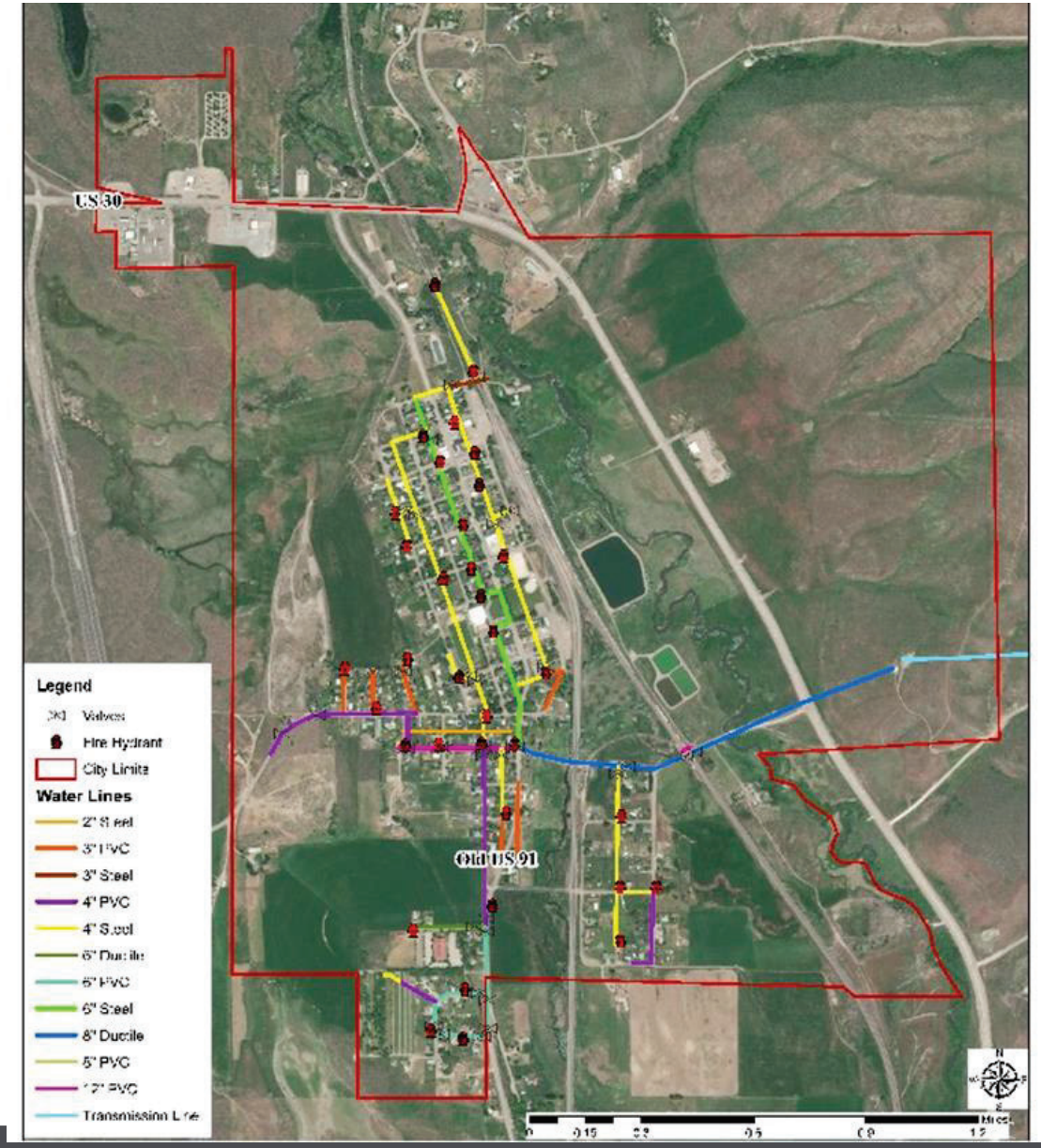
July 8, 2020

and

August 12, 2020

KELLER ASSOCIATES

Existing System



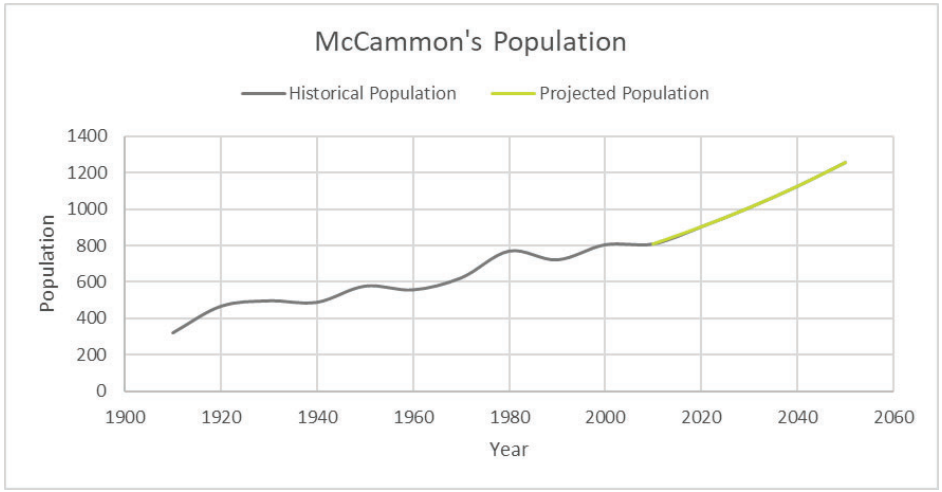
KELLER ASSOCIATES

Population/Water Demand Projection

Year	Population	Growth Rate
1950	578	1.67%
1960	557	-0.37%
1970	623	1.12%
1980	770	2.12%
1990	722	-0.64%
2000	805	1.09%
2010	809	0.05%

Year	Forecasted Population	Max Day Demand (gpm)
2020	849	870
2030	947	971
2040	1057	1083
2050	1180	1210

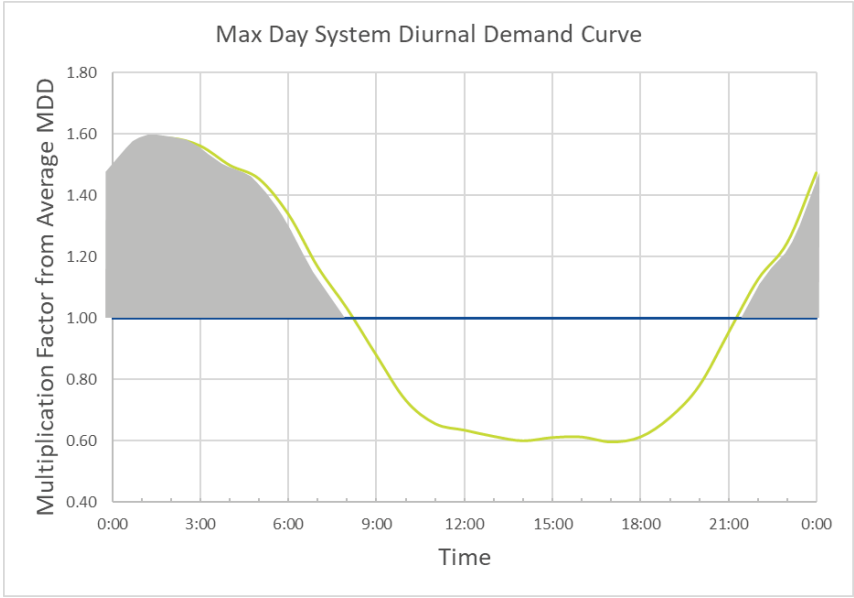
Assumes Per Capita Max Day Usage of 1,476 gallons



Assumed Annual Growth Rate of 1.1%

Design Criteria

- Water Rights – ≥ Maximum Day Demand
- Supply – Firm Capacity ≥ Maximum Day Demand
- Storage
  - Operational
  - Equalization
  - Dead Storage
  - Fire Suppression
- Delivery
  - > 40 psi working pressure
  - > 20 psi during fire



Supply Analysis

Supply vs. Demand

Year	Forecasted Population	Max Day Demand (gpm)	Existing Firm Capacity (gpm)	Surplus/(Deficiency) (gpm)
2020	849	870	300	(570)
2030	947	970	300	(670)
2040	1057	1083	300	(783)

Storage Analysis

Storage Requirement with Decreasing Demand

MDD (gpcd)	2040 (MG, FC=300 gpm)	2040 (MG, FC=500 gpm)
1476 (current)	2.10	1.77
1000	1.52	1.19
500	0.91	0.58

Current and Projected Storage Requirement

Storage Component	2020 (MG)	2040 (MG)
Equalization[1]	0.82	1.13
Fire Suppression[2]	0.96	0.96
Standby[3]	0	0
Subtotal	1.78	2.09
Operational, 10%	0.18	0.21
Dead, 5%	0.09	0.10
Total - Required Storage	2.05	2.40
Available	0.30	0.30
Additional Storage Needed	**1.75**	**2.10**

[1]MDD minus Firm Capacity for 24 hrs

[2]Elem. school; 4000 gpm for 4 hours

[3]Spring requires no backup power, fire flow accounted for separately

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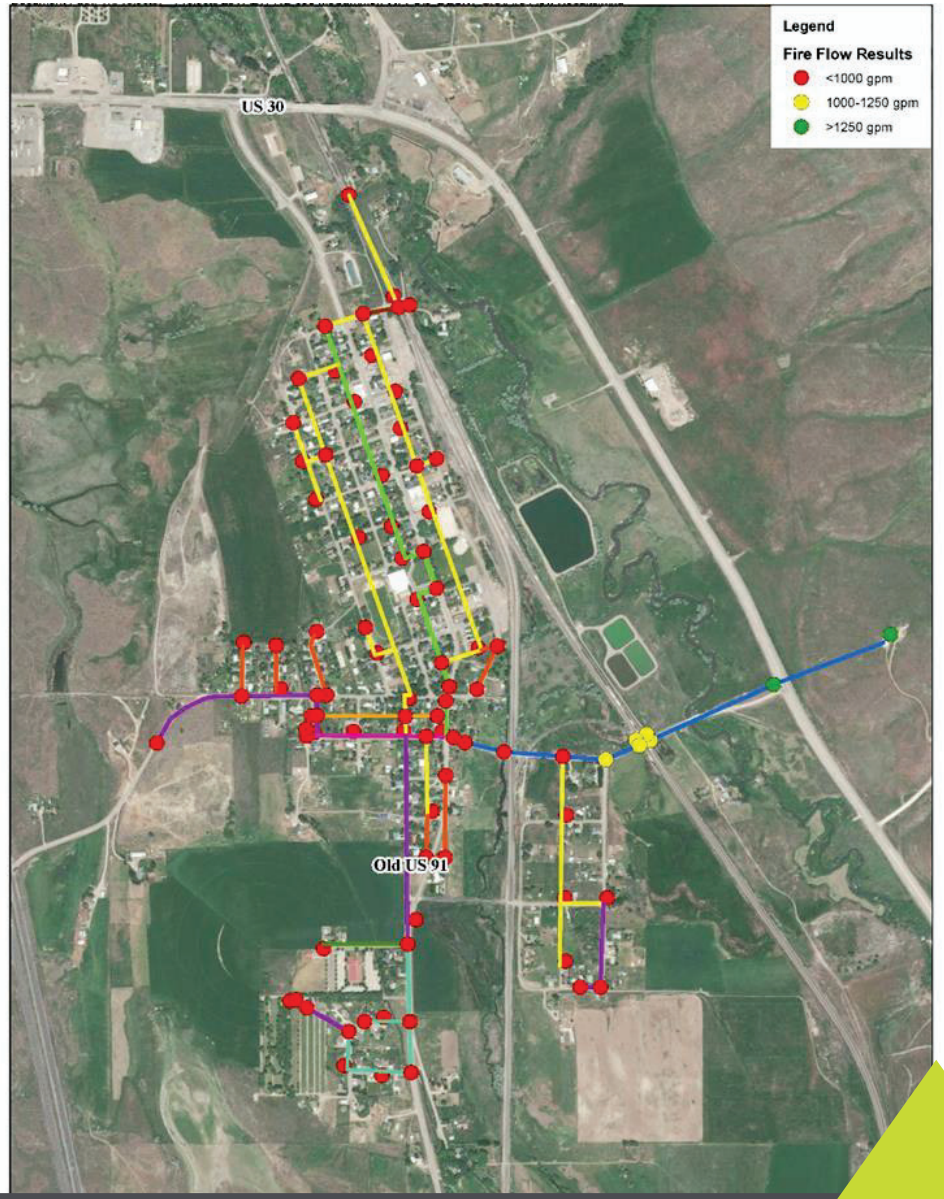
Fire Flow Analysis

- Target residential fire flow = 1,250 gpm
- Average available fire flow = 384 gpm



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Recommended Improvements

- 2 Million Gallons New Storage
- Increase transmission line size from tank to 12th Street
- Replace inoperable fire hydrants
- Install water meters
- New well(s)
- Replace undersized lines and glued pvc pipe

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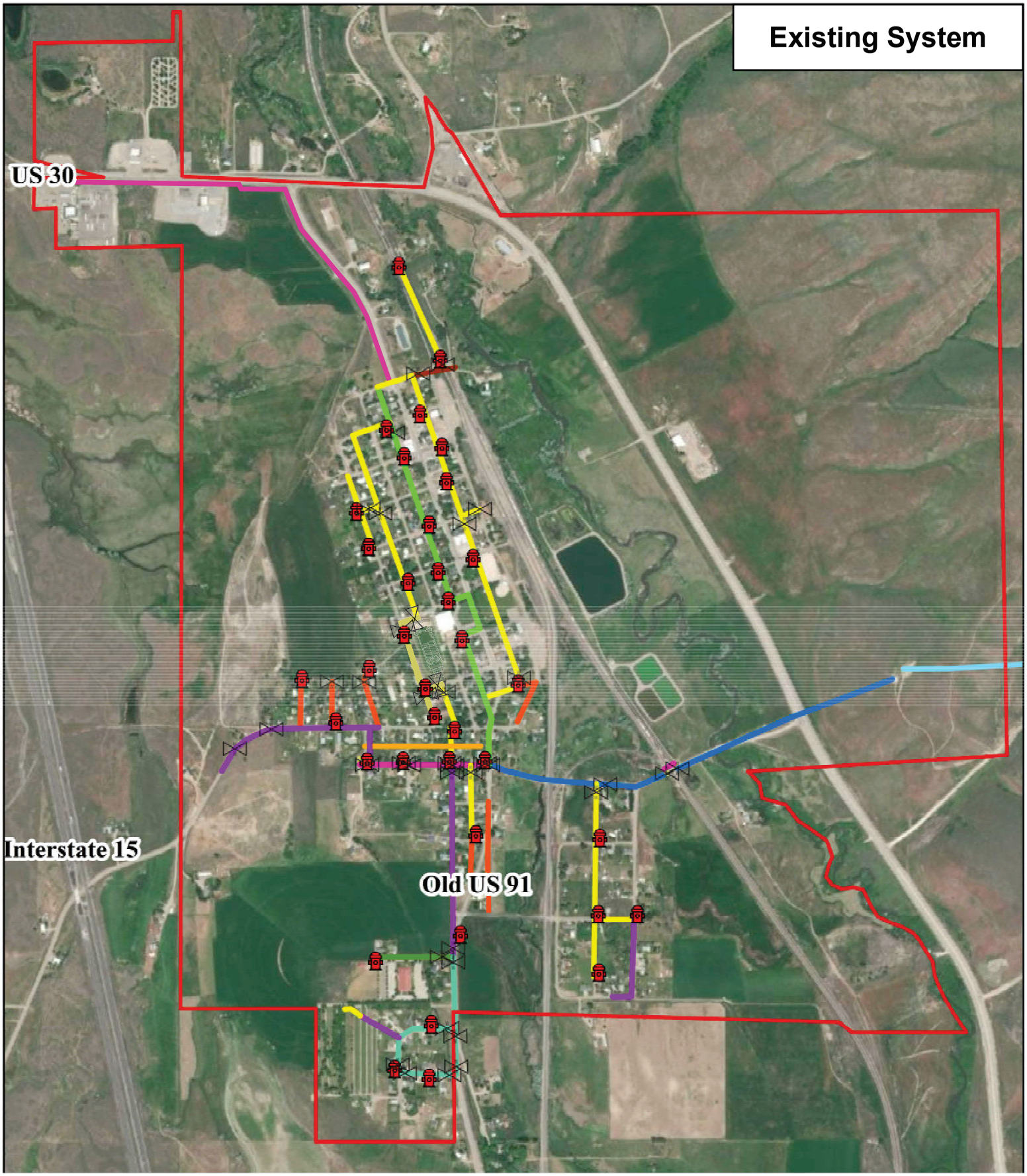
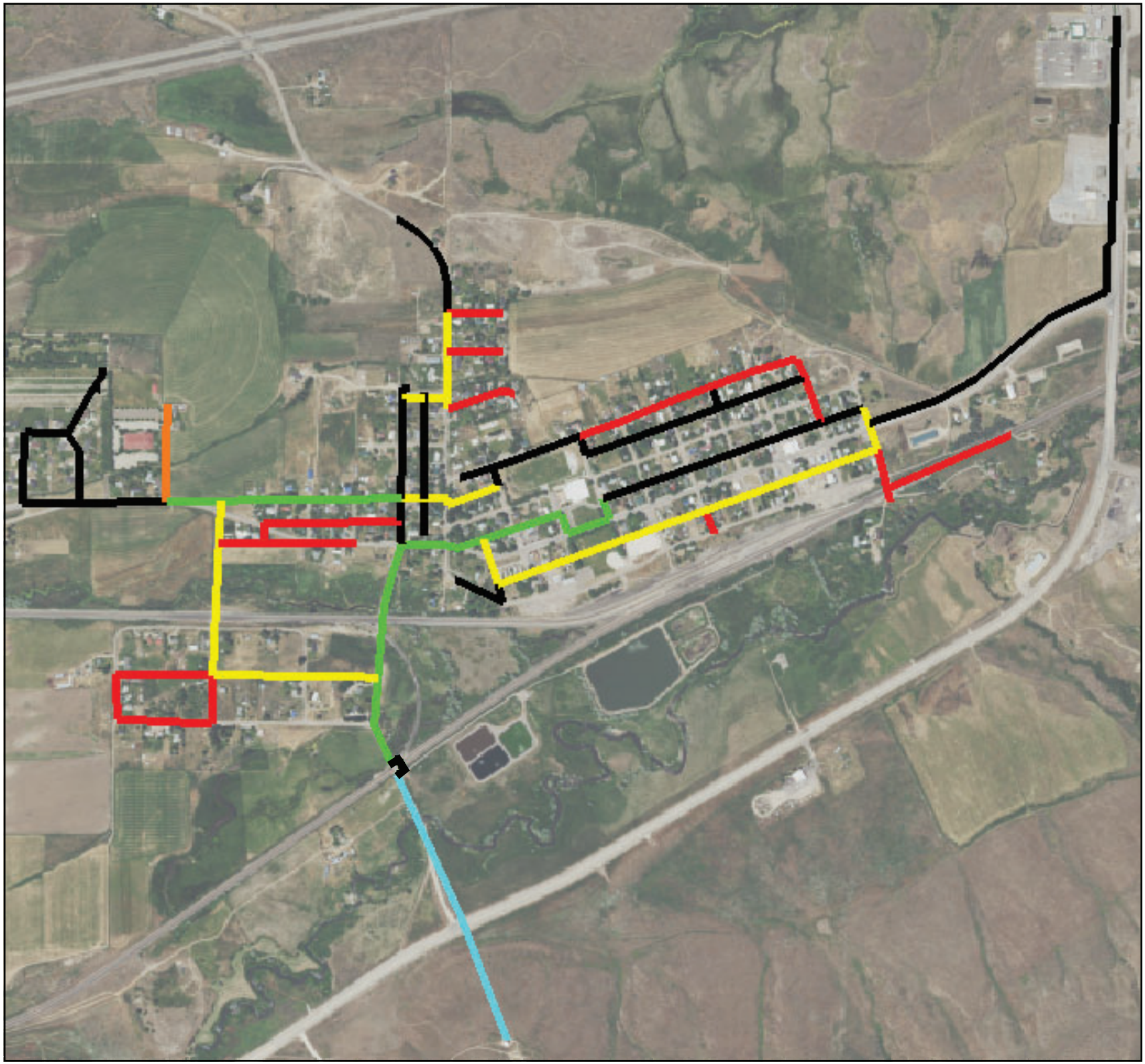

Existing System
US 30
Interstate 15
Old US 91
Legend
Valves
Fire Hydrant
City Limits
Water Lines
3" Steel
6" Ductile
8" Ductile
Transmission Line
2" Steel
4" PVC
6" PVC
8" PVC
3" PVC
4" Steel
6" Steel
12" PVC
Miles
0
0.125
0.25
0.5
0.75
1
N
W
E
S



Capital Improvement Plan

ID#	Name	Description	Cost	Cost/EDU/mo.	Need Addressed
1.1	Tank #2	1.05 million gallon tank	$ 1,441,000	$ 17.09	Storage
1.2	Transmission	Upsize transmission line from tank to the system	$ 1,146,000	$ 13.59	Transmission, Fire Flow
1.3	Well #3 Pump	Replace pump and motor to increase production	$ 20,000	$ 0.24	Increase Firm Capacity
2.1	Center	Replace undersized water lines and service lines to the property line. Replace non-working fire hydrants, add hydrants to improve coverage, install meter pits.	$ 376,000	$ 4.46	Fire Flow, Meters, Hydrants
2.2	State St. - North		$ 121,000	$ 1.44	Fire Flow, Meters, Hydrants
2.3	Logan St. Loop		$ 274,000	$ 3.25	Fire Flow, Meters, Hydrants
2.4	State St. - South		$ 288,000	$ 3.42	Fire Flow, Meters, Hydrants
2.5	16th St.		$ 123,000	$ 1.46	Fire Flow, Meters, Hydrants
2.6	15th St. Loop		$ 253,000	$ 3.00	Fire Flow, Meters, Hydrants
2.7	Gear St.		$ 371,000	$ 4.40	Fire Flow, Meters, Hydrants
2.8	Front St.; 9th to 5th		$ 400,000	$ 4.74	Fire Flow, Meters, Hydrants
2.9	Front St.; 5th to 1st		$ 333,000	$ 3.95	Fire Flow, Meters, Hydrants
2.10	11th St.		$ 359,000	$ 4.26	Fire Flow, Meters, Hydrants
2.11	Townsite Loop		$ 460,000	$ 5.46	Fire Flow, Meters, Hydrants
2.12	N. RR Extension		$ 229,000	$ 2.72	Fire Flow, Meters, Hydrants
3.1	Well #4	New well on the north side of the city	$ 434,000	$ 5.15	Increase Firm Capacity
3.2	Tank #3	1.05 million gallon tank	$ 1,404,000	$ 16.65	Storage
		Total Improvements	***$ 8,032,000***	***$ 95***	

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

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Funding Options

- DEQ State Revolving Fund
  - 30-years, 1.5% interest, ~ 10% principal forgiveness
- USDA-RD
  - 40-years, 2% interest, 20%-30% grant
- Idaho Community Development Block Grant
  - $500,000 grant
- USACE
- BOR – WaterSMART grant
  - Tier 1 – up to $750,000; Tier 2 – up to $1.5 M
  - 50% non-federal match

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User Rates

	DEQ/BG Total Project	DEQ Per $1M	USDA-RD/BG Total Project	USDA-RD Per $1M
Project Total	$ 8,032,000	$ 1,000,000	$ 8,032,000	$ 1,000,000
DEQ/USDA LF/Grant	$ 803,200	$ 100,000	$ 1,606,400	$ 200,000
Block Grant	$ 500,000		$ 500,000	
Loan Amount	$ 6,728,800	$ 900,000	$ 5,925,600	$ 800,000
Term (years)	30	30	40	40
Interest Rate	1.75%	1.75%	2.00%	2.00%
Annual Debt Service - New Debt	$290,211.49	$38,816.78	$216,614.74	$29,244.60
Annual Debt Service - Existing Debt	$21,106.00		$21,106.00	
Monthly Debt Service - New and Existing	$ 25,943.12	$ 3,234.73	$ 19,810.06	$ 2,437.05
Annual Short-lived Asset Reserve			$ 3,267.00	
Users	300	300	300	300
Monthly Debt Service per User	$ 86.48	$ 10.78	$ 66.03	$ 8.12
Debt Service Reserve per User	$ 8.65	$ 1.08	$ 6.60	$ 0.81
Short-lived Asset Reserve per User	$ -	$ -	$ 0.91	$ -
Total Monthly Fixed (Debt + Reserves) Costs p	$ 95.12	$ 11.86	$ 73.54	$ 8.94
Monthly O&M	$ 7,719		$ 7,719	
Total Monthly Variable Costs per User	$ 25.73	$ -	$ 25.73	$ -
Total Monthly Cost per User	**$ 120.85**	**$ 11.86**	**$ 99.27**	**$ 8.94**

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